Australia's health 2008

The Australian Institute of Health and Welfare is Australia's national health and welfare statistics and information agency. The Institute's mission is *better information and statistics for better health and wellbeing*.

Please note that as with all statistical reports there is the potential for minor revisions of data in this report over its life. Please refer to the online version at <www.aihw.gov.au>.

Australia's health 2008

The eleventh biennial health report of the Australian Institute of Health and Welfare

Australian Institute of Health and Welfare
Canberra
Cat. no. AUS 99

ISBN 978 1 74024 762 7
ISSN 1032-6138

The Australian Institute of Health and Welfare’s website can be found at <www.aihw.gov.au>.

Suggested citation

Australian Institute of Health and Welfare 2008. Australia’s health 2008. Cat. no. AUS 99. Canberra: AIHW.

Cover art by Georgina Pollard, National Art School, Darlinghurst, NSW

Layout by Tony Kelly, [tk] *type*

Printed by National Capital Printing, Canberra

Published by the Australian Institute of Health and Welfare

Australian Government
Australian Institute of
Health and Welfare

Better information and statistics
for better health and wellbeing

The Hon Nicola Roxon MP
Minister for Health and Ageing
Parliament House
CANBERRA ACT 2600

Dear Minister

On behalf of the Board of the Australian Institute of Health and Welfare I am pleased to present to you *Australia's health 2008,* as required under Subsection 31 (1) of the *Australian Institute of Health and Welfare Act 1987*.

I commend this report to you as a significant contribution to national information on health needs and services and to the development and evaluation of health policies and programs in Australia.

Yours sincerely

Hon. Peter Collins, AM, QC
Chairperson of the Board

7 May 2008

26 Thynne Street, Fern Hill Park, Bruce ACT • GPO Box 570, Canberra ACT 2601
phone **02 6244 1000** • facsimile **02 6244 1299** • web **www.aihw.gov.au**

Editorial team

Paul Magnus

Susan Killion

Chapter coordinators

Chapter 1:	**Introduction** Susan Killion
Chapter 2:	**The health of Australians—an overview** Tracy Dixon
Chapter 3:	**Whose health? How population groups vary** Louise York
Chapter 4:	**Determinants: keys to prevention** Mark Cooper-Stanbury
Chapter 5:	**Diseases and injury** Lynelle Moon
Chapter 6:	**Health across the life stages** Louise York
Chapter 7:	**Health services** George Bodilsen and Duane Riley
Chapter 8:	**Expenditure and workforce** Gail Brien
Chapter 9:	**Health system performance** Vicki Bennett and Jane McIntyre

External contributors or referees

The editorial team and authors thank the following organisations and individuals who drafted material or provided comments on various chapters in *Australia's health 2008*. Their critical and constructive work added to the quality and authority of this publication and their valuable contribution is gratefully acknowledged.

AIHW Board members

Department of Health and Ageing (Australian Government)

Australian Bureau of Statistics (Australian Government)

Department of Veterans' Affairs (Australian Government)

Department of Defence (Australian Government)

Tony Butler

Stan Bennett

Azar Karimina

Sanjaya Senanayake

AIHW contributors

Many individuals from the AIHW or its collaborating units made significant contributions to *Australia's health 2008*.

Fadwa Al-Yaman
Phil Anderson
Lyle Baker
Christina Barry
David Batts
Vicki Bennett
Rebecca Bennetts
George Bodilsen
David Braddock
Clare Bradley
Brendan Brady
John Brennan
Gail Brien
Helena Britt
Anne Broadbent
Ilona Brockway
David Bulbeck
Sally Bullock
Katrina Burgess
Louise Catanzariti
Sergio Chrisopoulos
Laura Cleator
Mark Cooper-Stanbury
Michael de Looper
Tracy Dixon
Deanna Eldridge
Katherine Faulks
John Glover
Melissa Goodwin
John Goss
Justin Graf
John Harding
Jenny Hargreaves
Christopher Harrison
James Harrison
Yvonne Helps
Geoff Henley
Di Hetzel
Moira Hewitt
Rebecca Hogan
Keith Horsley
Nicole Hunter
Clara Jellie
Rosemary Karmel
Susan Killion
Paula Laws
Robert Long
Paul Magnus
Guy Marks
Sushma Mathur
Jane McIntyre
Paul Meyer
Tony Mole
Lynelle Moon
Louise O'Rance
Alex Peng
Ann Peut
Andrew Phillips
Indrani Pieris-Caldwell
Sophie Pointer
Kirrily Pollock
Leanne Poulos
Andrew Powierski
Naila Rahman
Duane Riley
Krys Sadkowsky
Carey Sebbens
Susana Senes
Michelle Shek
Mark Short
Shubhada Shukla
Gary Slade
Chris Stevenson
Christine Sturrock
Liz Sullivan
Amber Summerill
Mardi Templeton
Phil Tennant
Anne Marie Thow
Perri Timmins
Bin Tong
Debbie Vandedonk
Robert van der Hoek
Anne-Marie Waters
Richard Webb
Xingyan Wen
Louise York

The contribution made by the Institute's Information Services and Publishing Unit and Media and Communications Unit is also gratefully acknowledged.

Contents

Preface

Welcome to *Australia's health 2008*, the eleventh of the Institute's flagship health reports to the nation over the past 20 years. The requirement for the AIHW to report to Parliament every 2 years on the health of the nation resonates well in today's welcome climate of 'evidence-based policy' in Australia. Our report card provides a comprehensive and detailed picture of what is happening in the health system and how well we are performing.

The complexity of the health system remains one of its key features, and the diagram included in Chapter 1 (Figure 1.4) provides a good picture of the complexity of funding arrangements and levels of responsibility that comprise the Australian health-care system.

This year's publication has a focus on equity. The chapter on population groups entitled 'Whose health?' aims to help the reader gain a more human focus on various health issues and to highlight health differentials and issues of equity. Throughout the report there are numerous analyses in relation to the differences for Aboriginal and Torres Strait Islander peoples, as well as a special Indigenous section in Chapter 3. For the first time there is also information about the health issues that relate to serving Defence Force personnel. In the end, statistics are about people, and when used well, they enable us to highlight where we need to focus our efforts.

Another key feature in this year's version is the inclusion for the first time, at the request of Health Ministers, of reporting against the set of 44 National Health Performance Indicators developed by the National Health Performance Committee in 2002. Chapter 9 brings together material on each NHPC indicator presented throughout the report. From this indicator set, the case can be made that Australia's health is very good on a range of fronts, with notable exceptions such as the health of Indigenous peoples. But how specifically and strongly can the health gains in recent decades be attributed to the *health system* and how it works—and how much to wider social and economic advances? Chapter 9 shows how difficult that attribution is, at least using this current set of national indicators.

Under the next national health-care agreements to commence from 1 July 2009, health performance will be reported against a new and broader set of indicators, currently under development in the Council of Australian Governments (COAG) processes.

We know from feedback and growing usage levels that this publication is well used and valued across Australia as an authoritative reference. It is humbling to work with the expert team of people—both in and outside the Institute—who have analysed and pulled together this comprehensive and detailed information. The expertise of some 80 authors has come together under the strong leadership and professionalism of Susan Killion and Paul Magnus, to produce this latest report. On behalf of the community of readers, I pass on my sincere thanks for the significant contribution they have made.

Dr Penny Allbon
Director, Australian Institute of Health and Welfare

Key points—*Australia's health 2008*

This section presents selected findings from the report. Also, each chapter from 2 to 8 begins with its own lists of key points. Please refer to the index at the back for more detail on these topics.

General

Life expectancy and death

- Australians enjoy one of the highest life expectancies in the world, at 81.4 years—second only to Japan.
- Death rates are falling for many of our leading health concerns, such as cancer, heart disease, strokes, injury and asthma.
- Cardiovascular diseases, cancers and respiratory diseases remain the leading causes of death overall.
- Injury is the most common cause of death in the first half of life.

Health, disease and disability

- Heart attack rates are falling and survival from the attacks is improving.
- Survival is improving for cancers overall.
- Asthma has become less common among children and young adults.
- Diabetes is becoming more common—prevalence at least doubling in the past two decades.
- Because of severe disability, over 1 million Australians need assistance with the core life activities of mobility, self-care or communication.

Health risks

- Tobacco smoking offers the greatest scope for prevention, closely followed by high blood pressure and overweight/obesity.
- Australia's level of smoking continues to fall and is among the lowest for OECD countries.
- Illicit drug use in Australia is generally declining, including the use of methamphetamine (the drug group that includes 'ice').
- The vaccination coverage of children is very high and continues to increase.
- Unsafe sexual practices continue, with generally increasing rates of sexually transmitted infections.
- About 7.4 million Australian adults were overweight in 2004–05, with over a third of those being obese (based on self reports).

Population groups

Mothers and babies

- Caesarean section rates increased from 18% in 1991 to 30% in 2005.
- Aboriginal and Torres Strait Islander babies are about twice as likely as other babies to be low birthweight or pre-term.

Children and young people

- Death rates among children and young people more than halved in the two decades to 2005, largely because of fewer injury-related deaths.
- Close to 3 in 10 children and young people are overweight or obese.

People aged 25–64 years

- The most common causes of death among this group are coronary heart disease for males (16% of their deaths) and breast cancer for females (15%).

Older people

- At age 65 years, Australian males can now expect to live to about 83 years and females to 86—about 6 years more than their counterparts a century ago.
- For older Australians, the most prominent health conditions in terms of death and hospitalisation are heart disease, stroke and cancer.

Socioeconomically disadvantaged people

- Compared with those who have social and economic advantages, disadvantaged Australians are more likely to have shorter lives, higher levels of disease risk factors and lower use of preventive health services.

Aboriginal and Torres Strait Islander peoples

- Indigenous people are generally less healthy than other Australians, die at much younger ages, have more disability and a lower quality of life.
- Despite some improvements in Indigenous death rates, the overall gap between Indigenous and non-Indigenous rates appears to be widening.
- However, the gap in death rates between Indigenous infants and other Australian infants is narrowing.

People in rural and remote areas

- People living in rural and remote areas tend to have shorter lives and higher levels of illness and disease risk factors than those in urban areas.

Prisoners

- Prison inmates tend to have poor mental health and high levels of health risk behaviours, such as drug and alcohol use, smoking, and unsafe sexual practices.

Overseas-born people

- Most migrants enjoy health that is equal to or better than that of the Australian-born population—generally with lower rates of death, hospitalisation, disability and disease risk factors.

Australian Defence Force members and veterans

- Death rates for Australian Defence Force members are lower than the general community's for overall mortality, cancer, cardiovascular disease, assault and suicide.
- Veterans tend to have poorer mental health than the general community, with the prevalence of mental health problems being closely related to the degree of combat exposure.

Health services

- In 2005–06, less than 2% of health expenditure was for preventive services or health promotion.
- About 85% of Australians visit a doctor at least once a year.
- Almost 1 in 9 GP encounters involves mental health-related problems—mostly depression, anxiety and sleep disturbance.
- Ambulances attended over 2.5 million incidents in Australia in 2005–06, of which 38% were emergency incidents.
- For the year 2005–06, over 9% of hospital admissions were considered potentially preventable.

Health workforce

- Health is a growing sector—between 2001 and 2006, the 23% growth in numbers employed in health occupations was almost double that for all occupations.
- The profile of the health workforce continues to age—the proportion of those aged 55 years and over was 16% in 2006 compared with 12% in 2001.
- Compared with major cities, remote areas have less than half the supply of medical practitioners and dentists (number of 'full-time equivalents' per 100,000 population).
- Comparing 2005 with 1997, the overall supply of primary care doctors (mostly general practitioners) was about 9% lower in 2005—but in remote areas the supply was 15% higher.

Health expenditure

- Australia spent 1 in every 11 dollars on health in 2005–06, equalling $86.9 billion, 9.0% of gross domestic product (GDP).
- As a share of its GDP, Australia spent more in 2005 than the United Kingdom (8.3%), a similar amount to Italy (8.9%) and much less than the United States (15.3%).
- Health spending per person was 45% more in 2005–06 than a decade before, even after adjusting for inflation.
- For Indigenous Australians in 2004–05, health spending per person was 17% higher than for other Australians.
- The spending on medications increased by 1.6% between 2004–05 and 2005–06—much less than the average increase of 8.6% per year in the decade before.

Introduction

1

Health and health care are important to Australians. They are frequent topics in the media, largely because they reflect our values and expectations and because health affects all of us in our daily lives. The health of Australia's people also has important implications for our national wellbeing and prosperity.

Australia's health 2008 is the eleventh biennial report on the health of Australians. It brings together the latest available national statistics compiled by the Australian Institute of Health and Welfare (AIHW) as a report card to the nation. It is intended to inform discussion and decisions about health and the health system. Target readers of this report include interested members of the public, clinicians, researchers, students, policy makers and government.

This 2008 edition charts the progress of health in the past two decades or more. It describes the health status of Australians as a population; disparities between particular groups of Australians; factors that influence health; specific diseases; health services; expenditure and the workforce; and indicators used to monitor these. Many of the topics covered in this report are more fully treated in separate AIHW publications, all of which are freely available on the AIHW website.

This report contains many important good-news stories such as declining rates of smoking, lower death rates for heart disease and decreasing use of most illicit drugs. But it also describes issues of concern such as increasing levels of diabetes and obesity and the poorer health of Australia's Indigenous peoples and those in lower socioeconomic areas.

The statistics draw on many data sources. Each has strengths and limitations that determine how it can be used and what inferences can be made from the results. The AIHW takes great care to ensure that data used here are correct and that the conclusions drawn are robust. Throughout the report we introduce major data sources by using a box to highlight some of the issues that need to be considered when interpreting results from them.

Box 1.1: Why some statistics appear old

Although this report is issued in 2008, nearly all of the statistics refer to 2006 or earlier. Why is this? First, some data, such as population-based surveys, are collected every 3 or 5 years or even less often. Second, whether collected recently or not, data can often take a year or more before they are fully processed and released to the AIHW. Finally, the AIHW in turn often needs some months to ensure the full quality and accuracy of statistics and their analysis before they are released.

This first chapter begins by discussing what health is and presents a brief picture of Australia today. It shows Australia's international standing in health and its comparative progress over recent decades. It then goes on to describe factors that influence health and the Australian health system. How the performance of the health system is measured is described next, along with recent developments in the national health information arena. It concludes by summarising the structure of the rest of the report and highlights what is different about this edition.

1.1 Understanding health

What is health?

Health is a concept that is often debated and continues to evolve. One view emphasises the presence or absence of disease and of medically measured risk factors. A more widely accepted view includes a wide range of social and economic risk and protective factors along with various aspects of wellbeing. Taking health at its simplest, the World Health Organization (WHO) defines it as a 'state of complete physical, mental and social wellbeing and not merely the absence of disease and infirmity' (WHO 1946). This definition has long encouraged health researchers to broaden their thinking and research to include a more holistic view of health. In this report we intend to convey the ideas that: health is an important part of wellbeing, of how people feel and function, and contributes to social and economic wellbeing; health is not simply the absence of illness or injury, and there are degrees of good health as well as of bad health; and health should be seen in a broad social context.

The development of health statistics is influenced by this evolution in thinking. Although the basis of most health statistics is still about ill-health (mortality and diseases), there are now serious efforts in Australia and many other countries to develop statistics on the broader aspects of health. The International Classification of Diseases and Related Health Problems (now in its 10th revision), which is mainly used to measure ill health, is now complemented by the International Classification of Functioning, Disability and Health (adopted in 2001) that provides a tool for measuring levels of functioning and health. Along with these advances, it is now accepted that physical, mental and social wellbeing are inextricably linked to our environment and social values.

A framework

This book is based on the conceptual framework presented in Figure 1.1, which shows that levels of health and wellbeing, including diseases and disability, are influenced by a complex interplay between health determinants, interventions and resources.

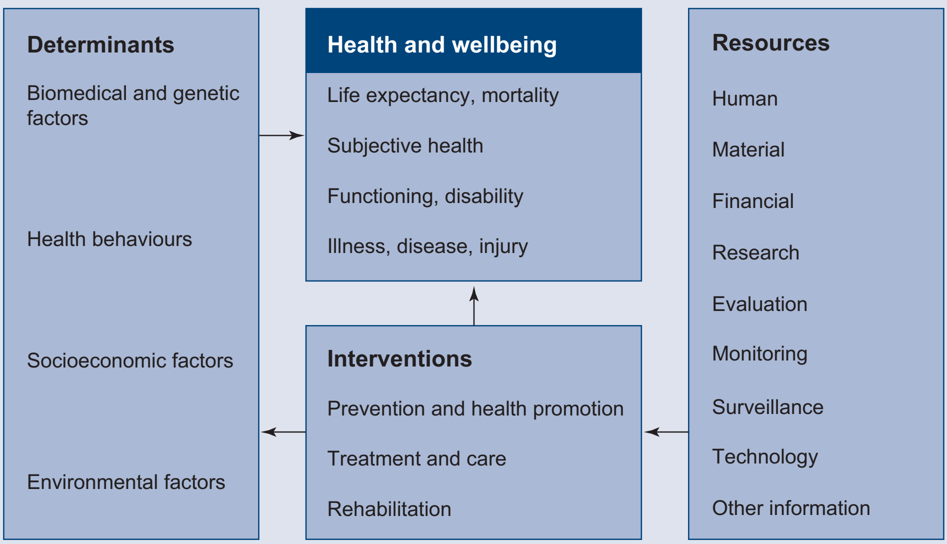


Figure 1.1: Conceptual framework for *Australia's health 2008*

Determinants such as behaviours and genetic makeup influence our chance of being healthy or unhealthy. Based on today's wisdom, some of these determinants lend themselves more readily to modification, such as individuals choosing not to smoke or governments making the roads safe. Others, such as our genetic structure, are not treated as modifiable, at least not at the population level. Interventions such as treatment or rehabilitation depend on the workforce and technology that enable them to be delivered.

Where possible, these aspects of health need to be considered in terms of the features and needs of individuals, population groups and the entire population. Finally, Australia's health can be viewed as a reflection of the performance of both the health system and of society as a whole.

1.2 Australia at a glance

Australia is a vast continent with a relatively small population: 21 million people as at June 2007. The population is highly urbanised, with over 70% living in metropolitan areas and mostly near the coastline.

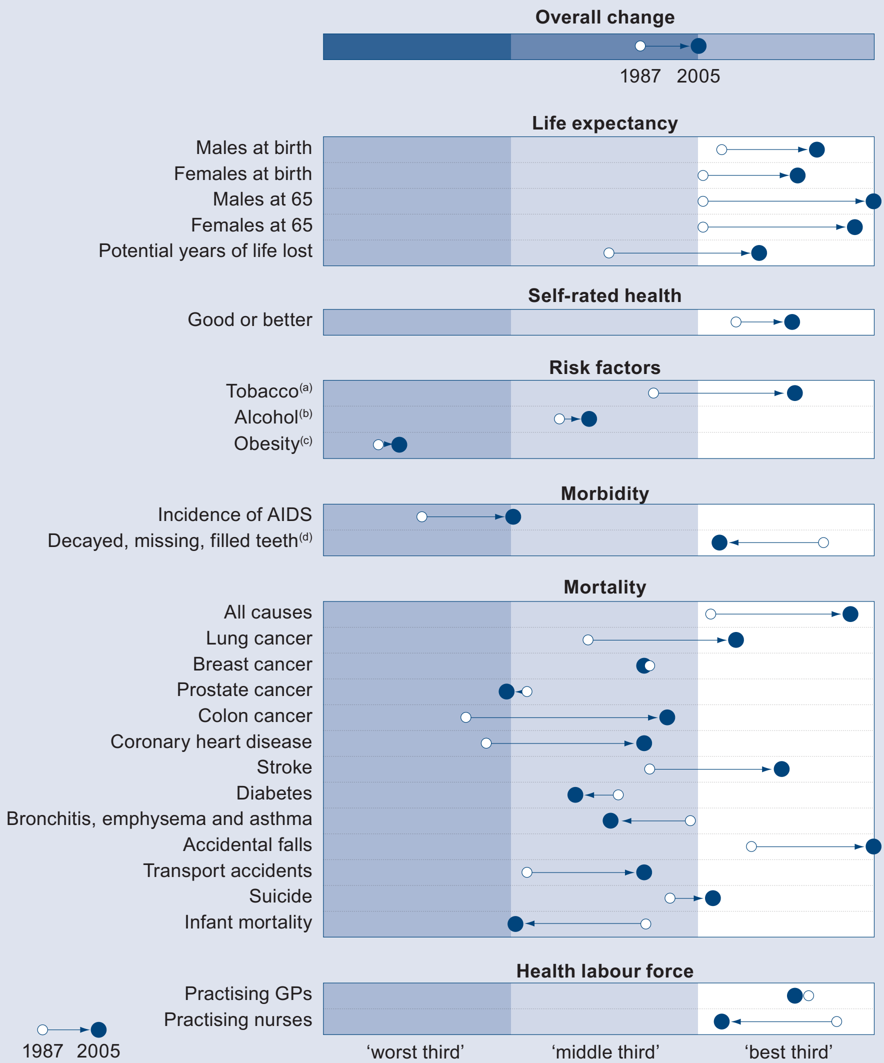
Australia is a nation made up mainly of migrants or their descendants. The proportion of Indigenous people identified in the 2006 Population Census was 2.5%. The countries of origin of Australia's population are diverse; migrants since World War II have come from all regions of the world. The population is also ageing. The median age (the age at which half the population is older and half is younger) of Australians has increased by more than 5 years over the last two decades from 31 years in 1987 to almost 37 years in 2007 (ABS 2007a).

Box 1.2: Australia at a glance

- Population of 21 million at June 2007
- In 2006 there were 517,200 Indigenous Australians (2.5% of the total population)
- Median age of Australians in 2007 was 36.8 years
- Most people living in Australia are born here, 76%. Of those born overseas, about 23% were born in the United Kingdom, 10% in New Zealand, 4% each in China and Vietnam
- Climate is varied but mainly dry; about 80% of the land is either desert or grassland and has minimal rainfall
- Most Australians live along the eastern seaboard and the south-eastern corner of the continent, in major cities
- Australia has a federal system of government with four divisions: Commonwealth, state, territory and local
- For gross domestic product (GDP) per person in 2005, Australia ranked eighth among OECD countries
- Total expenditure on health in Australia in 2005–06 was 9% of GDP
- Unemployment was at 4.3% in October 2007
- Fertility rate was 1.8 births per female in 2005–06, a slight increase from the preceding 5 years.

1.3 Australia compares well

Australia's level of health continues to improve overall. Moreover, in most aspects of health Australia matches or leads other comparable countries (those from the Organisation for Economic Co-operation and Development: OECD). Figure 1.2 shows broadly how Australia ranked in 1987 and 2005 on various measures of health among 30 member countries of the OECD. Where data were available for a substantial number of countries (on average, 25 countries for each indicator), comparisons were made for the years 1987 and 2005. In a few cases data relate to preceding years.



Notes

(a) Daily smokers as a proportion of population aged 15 years and over.

(b) Litres of pure alcohol per capita aged 15 years and over.

(c) Proportion of the population with a Body Mass Index greater than 30.

(d) Average number for 12 year olds.

Source: OECD 2007.

Figure 1.2: Australia's ranking among OECD countries, selected indicators, 1987 and 2005

In 2005, Australia's life expectancy at birth had risen to be one of the highest in the world. Life expectancy at age 65 for males ranked equal first with Japan, and for females it was equal second with France. Between the years compared, Australia's ranking among OECD countries improved markedly for mortality rates from coronary heart diseases, stroke, lung and colon cancer, and transport accidents, and in 2005 we had the lowest death rates from accidental falls in the OECD. Our smoking rates have continued to fall, with the ranking improving from middle third to 'best' third. The ranking for lower alcohol consumption also improved a little. The dental health of our 12 year olds slipped in rank somewhat since 1987, though it remained in the 'best' third.

However, since 1987 our ranking fell in relation to death rates for respiratory diseases, diabetes and, to a lesser extent, prostate cancer. Although there has been a small improvement in Australia's ranking for adult obesity rates since 1987, Australia remains in the 'worst' third of all OECD countries on this measure. However, note that Australia is among a small number of countries that provide bodyweight estimates based on actual measures of people's height and weight rather than self-report. This difference in methods limits data comparability.

Australia's infant mortality rate ranked almost in the 'worst' third of OECD countries in 2005, despite halving between 1985 and 2005.

1.4 Improving health and measuring performance

Many things influence health—as further described in Chapter 4—including preventive and treatment interventions. Living in a country that is socially and economically prosperous is arguably the most important factor in ensuring a good average level of health for a population. A prosperous country can afford to spend more on health care, thereby improving the health of its population. Improving health can lead to improved education and employment which, in turn, lead to economic and social prosperity.

However, these influences are not necessarily experienced to the same degree by some groups. There are differences among groups—such as their education and income levels, their choices about healthy living, and so forth.

Action on broad social risk and protective factors can be seen as the widest and most far-reaching form of 'health intervention'. Such action is among the great aims of society for reasons that include health, in its narrower sense, but which go well beyond it. It follows that this involves much more than the health system. However, that system can do much in its own right. Its activities range from clinical and preventive services and programs through to efforts to help improve the physical, social and economic environment for groups or individuals at special risk.

Given the great range of influences on health, major improvements depend on strong partnerships between components of the system—such as public and private health and clinical care—and require that the health sector works with other sectors to make the best use of available resources. Partnerships are also vital between the health system and others involved in the lives of those using the system, such as family and friends, teachers and employers.

As in other areas of public policy, pursuing the best health for a society needs to involve value judgments and includes political processes with competing interests. Along with limited resources, the challenge requires choices, priority setting and trade-offs between the health sector and other sectors, between prevention and treatment services, between improving health overall and reducing inequalities, and between short-term and longer-term objectives.

National health performance

In 2001, Australia's National Health Performance Committee (NHPC) adopted a conceptual framework specially designed for measuring health system performance. This framework (shown in Figure 1.3 in a shorter form) is consistent with the conceptual framework for this book, and offers a structure for considering the performance of the health system. The framework components include:

- availability and accessibility of services and programs
- appropriateness or relevance of interventions
- effectiveness of interventions in achieving the desired outcome
- responsiveness of the health system to individual or population needs
- the degree to which care is integrated and coordinated.

Chapter 9 describes in more detail the nationally endorsed performance indicators based on this framework and provides commentary on changes since the last NHPC report in 2003.

Health status and outcomes			
Health conditions	Human function	Life expectancy and wellbeing	Deaths

Determinants of health				
Environmental factors	Socioeconomic factors	Community capacity	Health behaviours	Person-related factors

Health system performance		
Effective	Appropriate	Efficient
Responsive	Accessible	Safe
Continuous	Capable	Sustainable

Source: NHPC 2001.

Figure 1.3: The National Health Performance Framework

1.5 The Australian health system: an outline

The Australian health care environment is complex, with many types of public and private service providers and a variety of funding and regulatory mechanisms.

Those who provide services include a range of medical practitioners, nurses, other health professionals, hospitals, clinics, and government and non-government agencies. Funding is provided by all levels of governments, health insurers and individual Australians. Health services and funding are covered in depth in chapters 7 and 8, but an overview is provided here to acquaint the reader with major elements of Australia's health system.

Overall coordination of the public health care delivery system is the responsibility of Australian Government and state/territory health ministers. They are supported by the Australian Health Ministers' Advisory Council (AHMAC)—a committee of the heads of the Australian Government, state and territory health authorities. AHMAC advises Australian health ministers on policy, resources and financial issues.

Given the complex funding arrangements and multi-faceted nature of the health system, it is no wonder that the public can find it difficult to understand who is responsible for their services and how to effect change. Figure 1.4 represents the main groups of health services, their funding sources and who has responsibility for their provision. It provides an at-a-glance picture to assist in answering the question, 'who funds and who runs the health system in Australia?' More complete information about service provision and funding is found in chapters 7 and 8.

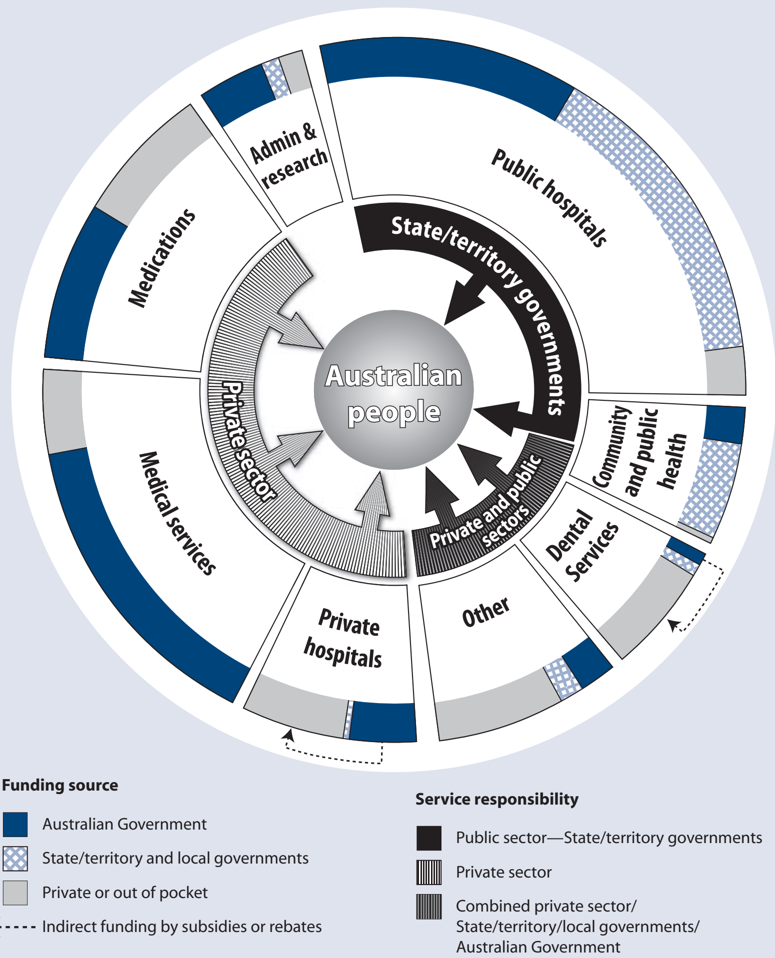


Figure 1.4: Health services—funding and responsibility

Starting with the outer ring, the proportion of different funding sources for each service group is colour coded. Funding is provided by the Australian Government, or state, territory and local governments, as well as private health insurance and out-of-pocket payments by individuals. Where Australian Government funding is provided indirectly in the form of subsidies or rebates, this is indicated by a broken arrow.

The next ring shows the major groups of services that comprise the health system. The size of each service group relates to its total expenditure. *Public hospitals, Private hospitals, Dental services*, and *Medications* are familiar elements of the system. The *Community and public health* group includes community nursing and public health education campaigns, among others. *Medical services* include general practice and specialist care as well as pathology and medical imaging. *Other* includes patient transport and aids, as well as health professionals such as physiotherapists and psychologists. *Administration and research* includes state departments of health and hospital or community health administration, as well as research and its funding. Examples are not exhaustive, and each group of services consists of many types of activities.

The darker arc inside the circle shows whether the service is provided by the private sector, public sector, or both. Examples of private sector providers include individual medical practices and pharmacies. Public sector service provision is the responsibility of state and territory governments, in the case of public hospitals, and a mixture of Australian Government and state, territory and local governments for community and public health services.

Who pays for health services?

Almost 70% of total health expenditure in Australia is funded by government, with the Australian Government contributing two-thirds of this and state, territory and local governments the other third. The Australian Government's major contributions include the two national subsidy schemes, Medicare and the Pharmaceutical Benefits Scheme (PBS). Medicare subsidises payments for services provided by doctors and optometrists and other allied health professionals such as clinical psychologists, and the PBS subsidises payments for a high proportion of prescription medications bought from pharmacies (individuals contribute out-of-pocket payments for these services as well). The Australian Government and state and territory governments also jointly fund public hospital services.

Between them, these government arrangements aim to give all Australians—regardless of their personal circumstances—access to adequate health care at an affordable cost or no cost. These schemes are further subsidised by social welfare arrangements, with larger rebates provided for individuals or families who receive certain income support payments (such as for unemployment or disability). There are also special health-care arrangements for members of the defence forces, and for war veterans and their dependants.

Services and subsidies

Most people's first contact with the health system is through a general medical practitioner (GP). Patients can choose their own GP and are reimbursed for all or part of the GP's fee by Medicare. For specialised care, patients can be referred by GPs to specialist medical practitioners, other health professionals, hospitals or community-based health-care organisations. Community-based services—a range of which can also be accessed directly by patients—provide care and treatment for issues such as mental health, alcohol and other drug use, and family planning.

Patients can access public hospitals through emergency departments, where they may present on their own initiative, via the ambulance services, or after referral from a medical practitioner. Public hospital emergency and outpatient services are provided free of charge, as is inpatient treatment for public patients. People admitted to a public hospital can choose to be treated there as either public or private patients, and others can choose to be admitted directly to a private hospital.

Private patients treated in a private hospital can select their treating specialist, but charges then apply for all of the hospital's services (such as accommodation and surgical supplies). Medicare subsidises the fees charged by doctors, and private health insurance contributes towards medical fees and hospital costs.

Australians also visit dentists and other private sector health professionals such as physiotherapists, chiropractors and natural therapists. Costs are usually met by the patients themselves or with the support of private health insurance.

Several state and territory governments and the Australian Government have established free 24-hour telephone-based health advice services in recent years. These are staffed by health professionals who answer queries from callers about health problems, assisted by specialised reference software.

Health insurance

In addition to their coverage by Medicare and the PBS, Australians have a choice of a wide range of private health insurance schemes. As of June 2006, 43.5% of the population was covered by basic private health insurance (PHIAC 2006). Participation in private health insurance membership is encouraged by an Australian Government tax rebate scheme. Hospital insurance schemes cover services in private hospitals as well as those provided in public hospitals for private patients. These are supplemented by additional schemes that cover a wide range of allied health and other professional services, including some alternative/complementary health services.

Other health services

Complementing the services outlined above is the provision of public health preventive services, which include:

- immunisation services and other communicable disease control (including biosecurity)
- public health education campaigns (including health promotion in the areas of nutrition and physical activity)
- activities to ensure food quality
- injury prevention activities
- programs to reduce the use and harmful effects of tobacco, alcohol and illicit drugs
- environmental monitoring and control
- screening programs for diseases such as breast cancer and cervical cancer.

Who regulates health services?

Health services are regulated in various ways. State and territory governments are responsible for licensing or registering private hospitals (including free-standing day hospital facilities), medical practitioners and other health professionals; and each state and territory has legislation relevant to the operation of public hospitals. State and territory governments are also largely responsible for industry regulations, such as the sale and supply of alcohol and tobacco products. The Australian Government's regulatory roles include overseeing the safety and quality of pharmaceutical and therapeutic goods and appliances, managing international quarantine arrangements, ensuring an adequate and safe supply of blood products, and regulating the private health insurance industry. There is also an established role for governments in the regulation of food safety and product labelling.

Other key parts of the system

Health services are supported by many other agencies. Research and statistical agencies provide the information needed for disease prevention, detection, diagnosis, treatment, care and associated policy. Consumer and advocacy groups contribute to public discussion and policy development. Professional associations for health practitioners set professional standards and clinical guidelines. Universities and hospitals train undergraduate and postgraduate health professionals. Voluntary agencies contribute in various ways, including raising funds for research, running educational and health promotion programs, and coordinating voluntary care.

Although they are not seen as strictly part of the health system, many other government and non-government organisations play a role in influencing health. Departments of transport and the environment, liquor licensing authorities and the media are just a few examples.

1.6 National health information

Health information is fundamental to developing evidence on which health policies and programs are based. That information can range from vital research into the nature, causes and mechanisms of disease; through clinical trials and other research into diagnosis and treatments; to the more statistical information derived from surveys or administrative data. In this report 'national health information' refers mainly to the last type of information (although it depends on the other types).

Following the components of Figure 1.1, health information in this context is about:

- assessing the level and distribution of the health of populations
- measuring the level, distribution and influence of determinants
- monitoring and appraising health interventions
- quantifying the inputs to the health system
- furthering knowledge through research and statistics
- evaluating the performance of the health system
- understanding the interrelationships of all of the above.

Increasing attention is being paid to organising health information that supports decision making, and there has been significant progress over the past 15 years in the collection and use of statistical information. The National Health Information Agreement (NHIA)—originally signed in 1993—includes the Australian Government Department of Health and Ageing, state and territory health agencies, the Australian Bureau of Statistics, the AIHW, the Department of Veterans' Affairs and Medicare Australia. The aim of the NHIA is to improve cooperation for the development, collection and exchange of data, and to improve access to uniform health information by community groups, health professionals, and government and non-government organisations. A major product of this agreement is the *National health data dictionary*, which is updated annually to provide standards for national health information and is used as a guide for gathering health data.

Achievements and developments

The vision for national health information in the years ahead is to promote its use to improve the health of populations. Building on the potential of information and communications technology, including e-health, the aim is to improve access to reliable, accurate, and timely information that can form the basis of discussions and decision making.

A strategic work plan for national health information was developed by AHMAC's principal information committee, formerly called the National Health Information Management Principal Committee (NHIMPC). This plan outlines achievements in recent years and the vision for future information development. Achievements include:

- more accurate enumeration of Aboriginal and Torres Strait Islander peoples in the Census and better quality and consistency of Indigenous identification in administrative data sets
- introduction of national minimum data sets for emergency departments and outpatient care and for government health expenditure
- inclusion of a data element into the Admitted Patient Care national minimum data set to assist in the quantification and description of adverse events in Australian hospitals
- the development of an information strategy by the Australian Commission on Safety and Quality in Health Care, outlining the Commission's initial plans for information and data work to support quality and safety improvement
- agreement on a systematic approach to nationwide surveillance of chronic diseases, supported by web-based tools
- work towards a national approach to data linkage and access to de-identified health data and to better accuracy and consistency of geographical data in the future
- the introduction by the AIHW of METeOR, an online metadata repository for national data standards for the health, housing and community services sectors; and the publication of a guide to data development, outlining sound data development practices to support the collection of high-quality data.

More detail on these developments can be found in the NHIMPC strategic plan and in the AIHW's annual report for 2006–07.

The four main priorities identified under the plan are:

- a stronger national approach, including strategic planning and partnerships across the health sector

- using health information to improve clinical care and reduce errors
- better health information for consumers
- better outcomes from targeted investment in health information (NHIMPC 2007).

Governance

The Principal Committee reporting to AHMAC on information plays a key role in ensuring there is central coordination across all governments and related agencies in relation to nationally relevant health information. The Principal Committee oversees subcommittees which negotiate and determine data standards and national initiatives to drive good quality data.

In January 2008, AHMAC agreed to reconstitute its principal information committee to include e-health alongside its existing focus on information management. Reflecting this broader focus, the principal committee has been renamed the National e-Health and Information Principal Committee (NEHIPC). As the e-health agenda plays out in Australia, the current ways of collecting information for the purposes of management, policy and research will be challenged. Work is well underway to examine the potential for harnessing information from new sources as well as the potential impacts on current data pathways.

The need to balance the public health use of information with community concern about personal privacy presents a key challenge for the health information system. Health information collected as a by-product of clinical services has been and will remain a very powerful tool in building improved health in Australia.

1.7 How this report is presented

Although this report follows the framework depicted in Figure 1.1, it is structured somewhat differently from previous editions. The main features of the chapters are described below. Chapters 2–8 include key facts in the beginning to summarise important messages in that chapter. Boxes and figures are used within the chapters to help the reader gain key insights quickly, and 'user friendly' language has been used as much as possible.

Chapter 2 provides an overview of the health status of Australians and answers questions such as 'Which diseases and conditions impose the greatest burden on our population? Is our health improving overall?'

Chapter 3 describes the health of particular population groups and shows that some, especially Aboriginal and Torres Strait Islander peoples, do not share in Australia's generally good health.

Chapter 4 focuses on the determinants of health: biomedical and genetic factors, health behaviours, socioeconomic factors and environmental factors. It discusses why some diseases happen in the first place and which preventable risk factors contribute to them.

Chapter 5 covers the main diseases and injuries seen in Australians and tracks changes in their levels, as well as their impacts on health system use.

Chapter 6 highlights key health issues over the life span, summarising the health of babies, children and young people, working-age people and older people.

Chapter 7 presents extensive information on health services and their use in Australia, including public health services, hospital services, and those from doctors and other health professionals.

Chapter 8 examines health system expenditure and funding, and describes statistics on the health workforce. It outlines some of the complexities of resourcing the health system.

Chapter 9 is a new chapter that brings together the national health performance indicators that appear in detail throughout the report. These indicators were developed for health ministers to monitor the performance of the health system. Results from these indicators are summarised and synthesised in this chapter.

Note that NHPC indicators are discussed in detail in the relevant chapters. For ease of identification they are annotated in italics and parenthesis; for example, '(*NHPC indicator 1.0*)'.

Statistical tables covering a range of topics are included after Chapter 9. Many of the tables provide time series information. Tables have also been included for some of the graphs in the report, for the benefit of readers who may wish to examine the data in more detail.

A list of abbreviations and a glossary are at the end of the report.

References

ABS (Australian Bureau of Statistics) 2007a. Population by age and sex, Australian states and territories 2007. ABS cat. no. 3201.0. Canberra: ABS.

ABS 2007b. Migration Australia 2005–06. ABS cat. no. 3412.0. Canberra: ABS.

NHPC (National Health Performance Committee) 2001. National health performance framework report. Brisbane: Queensland Health.

NHIMPC (National Health Information Management Principal Committee) 2007. Strategic work plan 2007–08 to 2012–13.

OECD (Organisation for Economic Co-operation and Development) 2005. OECD health data 2005: a comparative analysis of 30 countries. Paris: OECD.

OECD 2007. Health at a glance 2007—OECD indicators. Paris: OECD.

PHIAC (Private Health Insurance Administration Committee) 2006. Annual report 2005–06. Canberra: AusInfo.

WHO (World Health Organization) 1946. Constitution of the WHO, 45th edition, Supplement, October 2006. Viewed 23 January 2007, <www.who.int/governance/eb/who_constitution_en.pdf>.

The health of Australians —an overview

2

Key points

- Australians enjoy one of the highest life expectancies in the world, at 81.4 years—second only to Japan.
- Death rates continue to fall and life expectancy to rise, but the fertility rate remains below the replacement level—all leading to ageing of the population.
- Many Australians live with long-term health conditions. Most of these conditions are not major causes of death, but they are common causes of disability and reduced quality of life.
- One in five Australians (4 million people) lives with some degree of disability.
- Because of severe disability, more than 1 million people need assistance with the core life activities of mobility, self-care or communication.
- Cardiovascular diseases, cancers and respiratory diseases remain the leading causes of death overall. However, injury is by far the most common cause of death in the first half of life.
- Almost three-quarters of deaths among people under 75 years are considered to be largely avoidable.
- Coronary heart disease is the largest single contributor to the burden of disease in Australia, followed by anxiety and depression.

How healthy are Australians? Which diseases and conditions impose the greatest burden on the population and the health-care system? How long can today's Australians expect to live? Is health improving overall?

The answers to these types of questions help to shape health policy, plan health service delivery and create strategies to improve the health of the Australian population. A few general measures of health status can provide useful information about these issues, both for the entire population and for particular groups within the community. These measures include life expectancy, fertility rates, causes of death, chronic disease prevalence and disability status.

This chapter describes Australia's health using general measures of health status. The population is considered as a whole, with some key differences highlighted for Aboriginal and Torres Strait Islander peoples. More detailed discussion of the health of the Indigenous population and other groups is in Chapter 3, and health across the life course is discussed in Chapter 6. Individual diseases and conditions are not considered in detail in this chapter either—comprehensive information about them is presented in Chapter 5.

2.1 Australia's changing population

An important aspect of monitoring a population's health is to track its demographic features: how large is the population, what is the ratio of males to females, what is its age composition, and how are these characteristics changing? Demographic trends not only reflect past health events, but also provide insights into the current and future health of the population.

An ageing population, for example, is much more than a demographic trend. In the context of health, population ageing may translate into higher overall morbidity and mortality. An increasingly older population also places extra demands on health-care facilities.

Other demographic aspects that provide good insights into a population's health are fertility, mortality and life expectancy. Birth and death rates are major drivers of a population's age structure, whereas life expectancy summarises the outlook on life based on current mortality patterns. Migration also contributes to changes in the size, structure and health of the population. These factors are discussed in turn below.

Age and sex structure

The estimated resident population of Australia in December 2006 was 20.9 million (preliminary data; ABS 2007b). Since Federation in 1901, the Australian population has increased by 16 million, with over 2 million added in the latest decade. Overall, natural increase (that is, the number of births exceeding the number of deaths) has contributed more to this growth than immigration, accounting for around two-thirds of the increase in the past 50 years.

Since 1901, the Australian population has undergone a significant demographic transition. Two major features of this have been declining fertility and declining mortality. A decline in fertility since the 1950s has led to slow growth of the population at younger ages, whereas declining mortality has contributed to large growth in the number of people in the older age groups. For example, the number of people aged 0–14 years increased by 46% between 1956 and 2006. In contrast, the number of people aged 65 years and over more than doubled over this period, and the number of people aged 85 years and over increased more than sevenfold. Australia's demographic transition over the last 50 years is illustrated in Figure 2.1, with the age structure changing from its pyramid-like look in 1956 to its present beehive shape.

In 2006, almost 2.7 million Australians (13.0% of the population) were aged 65 years and over (Table 2.1). This proportion was similar to that in the United States and Canada, but substantially lower than in Japan and Italy. Around 1.6% of Australia's population (322,000 people) were aged 85 years and over. By comparison, in 1956, 8.4% of the population were aged 65 years and over and 0.4% were aged 85 years and over.

Table 2.1: Estimated resident population, ages 65 years and over, 2006[(a)]

	Males		Females	
Age group	Estimated resident population	Per cent of population	Estimated resident population	Per cent of population
65–69	385,226	3.7	393,943	3.8
70–74	302,778	2.9	326,360	3.1
75–79	252,158	2.5	299,330	2.9
80–84	166,000	1.6	239,328	2.3
85–89	75,405	0.7	138,933	1.3
90–94	24,167	0.2	61,649	0.6
95–99	4,305	<0.1	15,091	1.4
100+	460	<0.1	1,981	<0.1
Total 65 and over	**1,210,499**	**11.7**	**1,476,615**	**14.1**
Total all ages	**10,290,338**	**100.0**	**10,441,150**	**100.0**

(a) Preliminary data.

Source: ABS 2007b.

Fertility

Two different measures are commonly used to describe trends and patterns in fertility: the number of children born per female, and the age of mothers giving birth.

Total fertility rate

The total fertility rate (TFR) is a summary measure used to describe the number of children a female could expect to bear during her lifetime if she experienced current age-specific fertility rates throughout her child-bearing life. This information may be supplemented by detailing the age-specific fertility rates.

The TFR in Australia was 1.8 births per female in 2006 (ABS 2007c). This figure is lower than the replacement level of 2.1—the rate needed to maintain the population size by 'replacing' the number of deaths. Over the last century, the TFR in Australia has varied considerably. After the Great Depression in the 1930s, during which the TFR fell almost to 2.0, it rose steadily to a high of 3.6 by 1961. The rate then declined, and since 1975 it has been below the replacement level, dropping to a low of 1.7 in 2001 (Figure 2.2).

These fertility trends mask considerable variation in age-specific fertility rates. Since the 1970s, fertility rates among younger females (aged 15–29 years) have declined, whereas rates among females aged 30–44 have increased. Fertility rates in Australia are now highest in the age group 30–34 years, at 120 babies per 1,000 females (ABS 2007c).

There were 2.7% more males than females in Australia's population in 1956, whereas in 2006 there were 1.2% more females than males. Females have outnumbered males since 1979, reflecting significant gains in female health compared with that of males during the mid-to-late years of the 20th century. The gap is reducing, however, with relatively greater increases in male life expectancy over the past two decades.

Median age

The median age of the population is the mark at which half is older and half is younger. It was estimated to be 36.8 years in June 2007, having increased by 5.5 years over the previous two decades (ABS 2007d). This increase results from Australia's long period of low fertility and increasing life expectancy.

Some developed countries have an even higher median age. In countries where the number of persons aged 65 years and over exceeds the number of children aged under 15, such as in Japan and Italy, the median ages are 42.9 and 42.3 years, respectively.

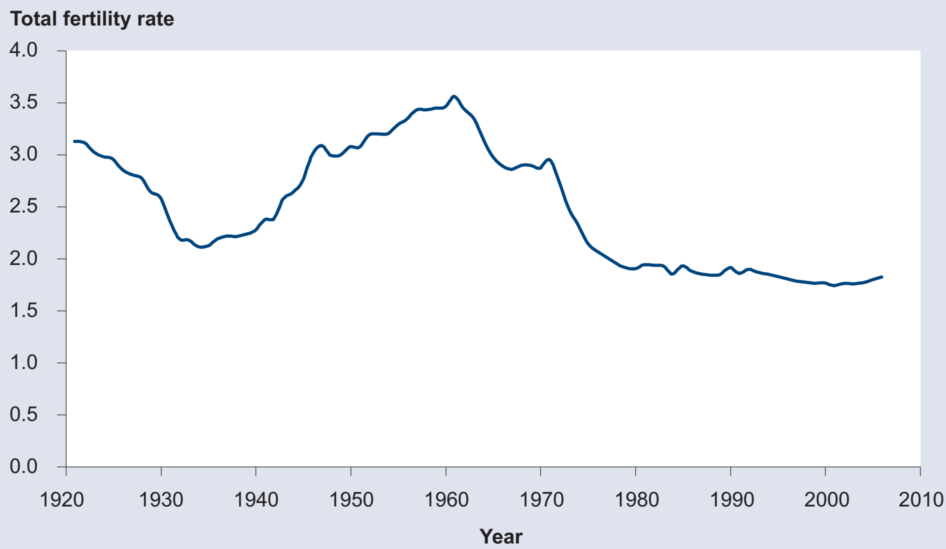
Note: The age group 85+ includes all ages 85 years and over, and is not directly comparable with other 5-year age groups.

Source: AIHW population database.

Figure 2.1: Age structure of the Australian population, 1956 and 2006

The older population

During the past several decades, the number and proportion of the population aged 65 years and over have increased considerably. The proportional increase in the Australian population aged 85 years and over has been even more marked.



Source: ABS 2007c.

Figure 2.2: Trends in total fertility rate, 1921–2006

The TFR also varies between Indigenous and non-Indigenous females, with an estimated rate of 2.1 births per Indigenous female in 2006 (ABS 2007c). However, the TFR for Indigenous females has decreased by almost 65% since the 1960s, when it was 5.8.

Median age of mothers

The median age of mothers giving birth is another useful measure of the fertility patterns of a population. It refers to the median age of all females giving birth in a particular year; in 2006, this was 30.8 years (ABS 2007c). The age has been continually increasing over the past three to four decades, after reaching a low of 25.4 years in 1971.

A more specific form of this measure is the median age of mothers at the birth of their first child. The median age of first-time mothers in 2005 was 28.0 years (Laws et al. 2007). This age has also been increasing over the past few decades.

More information about Australia's mothers and babies can be found in Chapter 6.

Migration

Inward and outward migration (immigration and emigration, respectively) also contribute to population change. Immigration has been a major factor in shaping Australian society, and today almost one-quarter of the population was born overseas. Since the launch of the Australian Migration Program in 1945, more than 6.5 million people have arrived in Australia with the intention of taking up long-term or permanent residence (DIMA 2001). At the same time, increasing affordability of international transport, along with greater transferability of skills in an international labour market, has resulted in rising long-term and permanent emigration (Hugo et al. 2001).

A simple way to measure the impact of migration on the population is to consider the value of net overseas migration (NOM). NOM is calculated as the number of long-term or permanent arrivals minus the number of long-term or permanent departures. Australia's NOM in 2005–06 was almost 147,000 persons, accounting for just over half of the country's net population growth over the 12 months to June 2006 (ABS 2007b).

People come to Australia from all over the world. Historically, the United Kingdom, Ireland, Germany, China and New Zealand were the major sources of immigrants to Australia, accounting for over 90% of overseas-born Australians in 1901 (Hugo et al. 2001). However, some major shifts in immigration patterns occurred in the second half of the 20th century. Resettlement of Europeans in the years after World War II resulted in increased numbers of immigrants from countries such as Greece, Italy, the Netherlands and Poland, and the gradual dismantling of the 'White Australia' policy between 1949 and 1973 paved the way for increased immigration from non-European nations such as Lebanon, Indonesia, Viet Nam, India, Chile and Fiji.

Changes in immigration patterns affect the relative age structures of different sections of the community. For example, compared with the Australian-born population, people born in Europe are more likely to be aged 65 years and over, whereas those born in Asia and the Middle East are more likely to be aged 15–34 years. The current European-born population is therefore likely to experience a different set of health issues compared with the Asian-born population; this has implications for planning public health strategies.

The health of most new immigrants is as good as or better than the health of the general Australian population, a phenomenon known as the 'healthy migrant effect'. On the other hand, socioeconomic, cultural and genetic factors mean that some risk factors and diseases are more common among certain population groups. Information on the health of overseas-born Australians can be found in Chapter 3.

Mortality

Data on death and its causes are vital measures of a population's health. Examining trends and patterns in mortality can help to explain changes and differences in health status, evaluate health strategies, and guide planning and policy making. Cause-specific mortality (which is discussed in Section 2.5) provides further insight into the events contributing to deaths, reflecting changes in behaviours, exposures, and social and environmental circumstances as well as the impacts of medical and technological advances.

There were 130,714 deaths registered in Australia in 2005. Male deaths outnumbered female deaths (67,241 compared with 63,473), with a death rate ratio of 107 males to 100 females (Table 2.2). About 25% of male and 15% of female deaths in 2005 were of persons aged under 65. The median age at death was 76.8 years for males and 82.9 years for females (ABS 2006b).

Death rates are declining in Australia. The age-standardised death rate (Box 2.1) for females fell by 73% between 1907 and 2005, from 1,844 to 490 per 100,000 population. The corresponding male death rate fell by 67%, from 2,234 to 728 per 100,000.

Table 2.2: Age- and sex-specific distribution of deaths, 2005

	Males		Females		Sex ratio	
Age group	**Number**	**Rate[(a)]**	**Number**	**Rate[(a)]**	**Crude[(b)]**	**Rate ratio[(c)]**
<1	714	538.3	588	471.2	121	114
1–14	306	15.8	223	12.2	137	130
15–24	959	66.7	350	25.7	274	260
25–44	3,666	124.4	1,762	59.7	208	208
45–64	11,663	467.6	6,971	279.0	167	168
65–84	35,199	3,205.3	26,990	2,146.2	130	149
85+	14,721	14,582.9	26,576	12,538.5	55	116
Unknown age	13	. .	13	. .	. .	. .
Total	**67,241**	**664.3**	**63,473**	**621.2**	**106**	**107**

. . Not applicable.

(a) Age-specific number of deaths per 100,000 persons.

(b) Male deaths per 100 female deaths.

(c) Male death rate divided by female death rate, multiplied by 100.

Note: For more detailed information, see statistical tables S12 and S13.

Source: ABS 2006b.

Box 2.1: Comparing death rates: age-standardisation

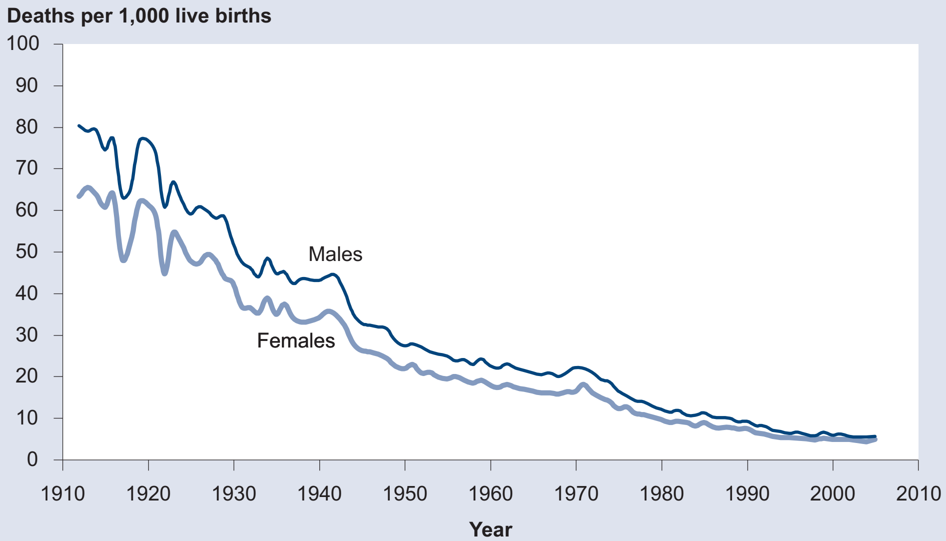
Statistics relating to deaths are sometimes presented as crude death rates; that is, the number of deaths in a year divided by the size of the corresponding population, indexed to 100,000. The crude death rate in Australia was 631 deaths per 100,000 persons in 2005.

However, the risk of dying and of getting various diseases varies greatly with age. This may make comparisons across populations misleading if they have different age structures, and even small age differences may lead to false conclusions. Similarly, analysis of time trends in death rates may be flawed unless this age relationship is taken into account. Age-specific comparisons can be made—that is, comparing death rates at specific ages—but this can be cumbersome because it requires numerous comparisons.

Variations in age structure, between populations or over time, can be adjusted for by a statistical procedure called age-standardisation. This procedure converts the age structure of the different populations to the same 'standard' structure. Using age-specific rates from the different populations, their overall rates that would then occur with the standard age structure can be calculated and compared. In other words, this allows the different populations to be compared on an equal age basis.

Unless otherwise specified, death rates in this report have been directly age-standardised to the Australian population as at 30 June 2001. Both the AIHW and the Australian Bureau of Statistics (ABS) have agreed to adopt 2001 as the national standard population. This same standard population was used in the 2004 and 2006 editions of *Australia's health*. The population at 30 June 1991 was the standard used in the 1996, 1998, 2000 and 2002 editions, whereas the 1992 and 1994 editions used the population at 30 June 1988 as the standard. For this reason, age-standardised death rates in this publication are not directly comparable with those given in editions before 2004.

These mortality reductions have occurred across all age groups. Reductions in infant and early childhood (0–4 years) mortality have been substantial, with deaths in this age group accounting for 25% of all deaths in 1910, 10% in 1930 and 1% in 2005. Declining infant mortality (deaths of those aged under 1 year) contributed significantly to this (Figure 2.3). Death rates among those of ‘parent age’ (25–44 years) fell rapidly during the first half of the 20th century, and have since continued to decline. Death rates among older Australians have also decreased considerably, particularly in the last 30–40 years (AIHW 2006).



Note: The infant mortality rate is calculated as the number of deaths of those aged under 1 year divided by the number of live births.

Sources: Commonwealth Bureau of Census and Statistics Bulletins (1912 to 1963); AIHW National Mortality Database (1964 to 2005).

Figure 2.3: All-cause infant mortality rates, 1912 to 2005 (*NHPC indicator 1.07*)

Reductions in death rates do not necessarily mean a lower death count. The annual number of deaths in Australia increased from 45,305 in 1907 to 130,714 in 2005. Much of this increase reflects population growth. Although the bulk of deaths in Australia currently occurs among those aged 65–84 years, the number of deaths in the 85 years and over group is increasing rapidly. The latter group will be the category with the largest number of deaths some time in the future.

Life expectancy

Life expectancy is the average number of years a person can expect to live if the existing mortality patterns continue (Box 2.2). It is one of the most commonly used summary indicators of a population’s health.

A direct consequence of declining death rates, as described earlier, is that Australians in general enjoy one of the highest life expectancies in the world. Australian females born in 2003–2005 could expect to live an average of 83.3 years, and a male could expect to live 78.5 years (ABS 2006b). But not all groups within the Australian community are so fortunate—among Aboriginal and Torres Strait Islander peoples, life expectancy at birth is around 17 years less than this. More detail about life expectancy for Indigenous Australians is presented in Chapter 3.

Box 2.2: Calculating life expectancy

Technically, life expectancy is the average number of years of life remaining to a person at any specified age. The most commonly used measure is the expectancy at birth, which estimates the average number of years a newborn can expect to live. Life expectancy is also calculated for other ages, in particular at ages 30, 65 and 85 years.

Life expectancy for a person is based on the prevailing mortality patterns in a population; the calculation assumes that the current death rates will persist throughout the person's life. The life expectancy of newborns is based on age-specific death rates that year and not on future, projected death rates.

For ease of understanding, in this report life expectancy is expressed as the age a person may expect to live to, rather than the additional number of years after achieving a particular age. For example, the life expectancy of a 65-year-old male is presented as 83.1 years, rather than 18.1 years.

Because of some difficulties in obtaining accurate information about births and deaths of Indigenous Australians, a special method is used to calculate life expectancy for Aboriginal and Torres Strait Islander peoples (see Chapter 3, Box 3.2).

Life expectancy at different ages

The calculation of life expectancy at birth takes into consideration factors affecting the full course of life, including the relatively higher death rates in the first few years of life. Some of these factors do not extend beyond those early years. Persons aged 30 years would have overcome many of these early risk factors and therefore would have an increased life expectancy. In 2003–2005, life expectancies for 30-year-old females and males were 84.1 years and 79.7 years, respectively, about 0.8 years and 1.2 years greater than for newborns in that period.

These increments in life expectancy with age continue into the later years of life as well. In 2003–2005, Australian females and males aged 65 years could look forward to living to the ages of 86.4 years and 83.1 years, respectively; again, substantially greater than life expectancy at birth and at age 30 years. For those aged 85 years, life expectancy was greater still at 92.1 years for females and 90.9 years for males.

Trends in life expectancy

Life expectancy in Australia has been increasing. Apart from a period around 1960 to 1970, when the death rates for heart disease were at their peak, life expectancy improved continually throughout the last century and into this century.

The overall increase in life expectancy at birth between 1901–1910 and 2003–2005 was about 42% (Table 2.3). For females, the increase was 24.5 years—from 58.8 to 83.3 years. For males, it was 23.3 years—from 55.2 to 78.5. Male life expectancy has been consistently lower than for females all through this period, although the size of the difference has varied.

Table 2.3: Life expectancy at different ages, 1901–1910 and 2003–2005

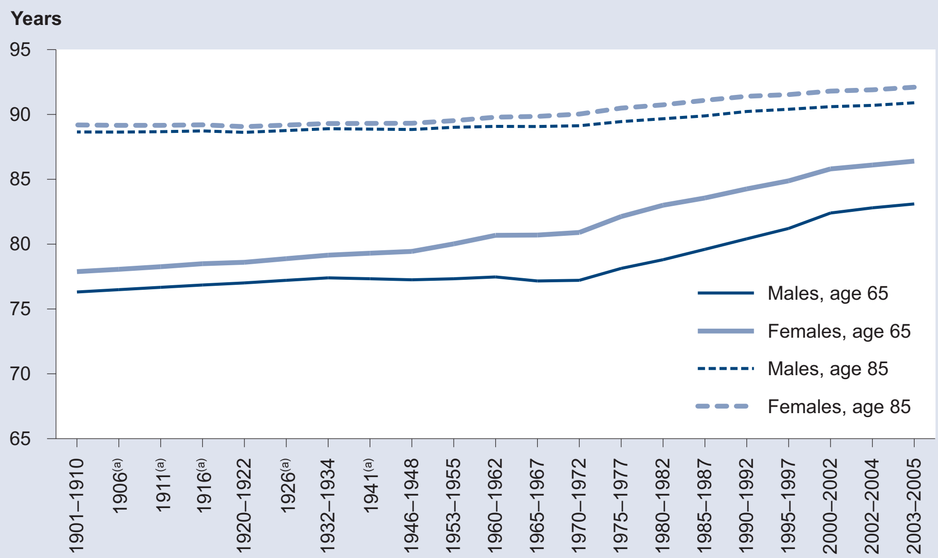
	Males		Females	
Age	**1901–1910**	**2003–2005**	**1901–1910**	**2003–2005**
Birth[(a)]	55.2	78.5	58.8	83.3
30	66.5	79.7	69.3	84.1
65	76.3	83.1	77.9	86.4
85	87.7	90.9	89.2	92.1

(a) *NHPC indicator 1.04*: Life expectancy at birth.

Note: For more detailed information, see statistical tables S9 and S10.

Sources: ABS 2006b; ABS unpublished data.

Early in the 20th century, improvements in life expectancy were made at middle or younger ages, with reductions in infant and child mortality being the major contributors. Life expectancies at birth and at age 30 years showed similar increasing trends over most of the 20th century. Life expectancy at age 65 years increased only slightly between 1900 and 1970, but from 1970 on it has consistently improved (Figure 2.4). Improvements in life expectancy for persons aged 85 years have also occurred since the 1970s.



(a) Pro-rated for missing years.

Source: AIHW population database.

Figure 2.4: Trends in life expectancy at various ages, 1901–1910 to 2003–2005

International comparisons of life expectancy

Overall, Australians enjoy one of the highest life expectancies in the world, at 81.4 years for males and females combined—second only to Japan, at 82.2 years (WHO 2007). Note that the estimates of Australian life expectancy presented here differ from those provided in earlier pages, because of a different estimation method used by the World Health Organization (WHO).

The WHO has estimated that the Australian male life expectancy in 2005 (79.0 years) was among the world's highest, marginally behind Iceland and ahead of Japan for the first time (Table 2.4). Similarly, female life expectancy in Australia (83.7 years) was close to that in the countries with the highest life expectancy.

Table 2.4: Life expectancy at birth, selected countries, 2005

Country	Males	Country	Females
Iceland	79.2	Japan	85.5
Australia	**79.0**	France	83.9
Japan	78.7	Switzerland	83.8
Switzerland	78.7	Italy	83.8
Sweden	78.7	**Australia**	**83.7**
Singapore	78.2	Spain	83.6
Canada	78.0	Sweden	83.0
Italy	77.9	Iceland	82.8
Norway	77.5	Canada	82.7
New Zealand	77.5	Norway	82.4
Spain	76.9	Singapore	82.3
France	76.8	New Zealand	81.9
United Kingdom	76.6	United Kingdom	81.1
United States of America	75.3	United States of America	80.4

Source: WHO 2007.

2.2 Self-assessment of health

An individual's rating of his or her own overall health is often used as an indicator of health status and, at the population level, as a predictor of health service use and mortality (Boult et al. 1993; Ford et al. 2007).

Information about health status is collected in many national and statewide surveys in Australia. The ABS National Health Survey (NHS; Box 2.3) asks respondents to assess their health against five grades, from excellent through to poor. Several other surveys generate similar information.

Box 2.3: The National Health Survey (NHS)

The NHS, conducted every 3 years by the ABS, is designed to obtain national information on the health status of Australians, their use of health services and facilities, and health-related aspects of their lifestyle (ABS 2006a). The most recent survey was conducted in 2007–08, with previous surveys being conducted in 2004–05, 2001, 1995, 1989–90, 1983 and 1977. The survey is community-based and does not include information from people living in non-private dwellings or institutions (such as nursing homes, hospitals or prisons).

Data available from the NHS include self-reports of various long-term conditions, health risk factors and use of health services. For some conditions, information about age at diagnosis, medications used and other actions taken for treatment or management is also available.

In the 2004–05 NHS, 56% of respondents aged 15 years and over assessed their health as very good or excellent. This was a small increase from the 52% in 2001 and the 54% in 1995 (Table 2.5). Similar proportions were also reported by adults (18 years and over) in the 2006 ABS General Social Survey (GSS) (ABS 2007a).

Table 2.5: Trends in self-assessed health status[a][b], 1995, 2001 and 2004–05 (per cent)

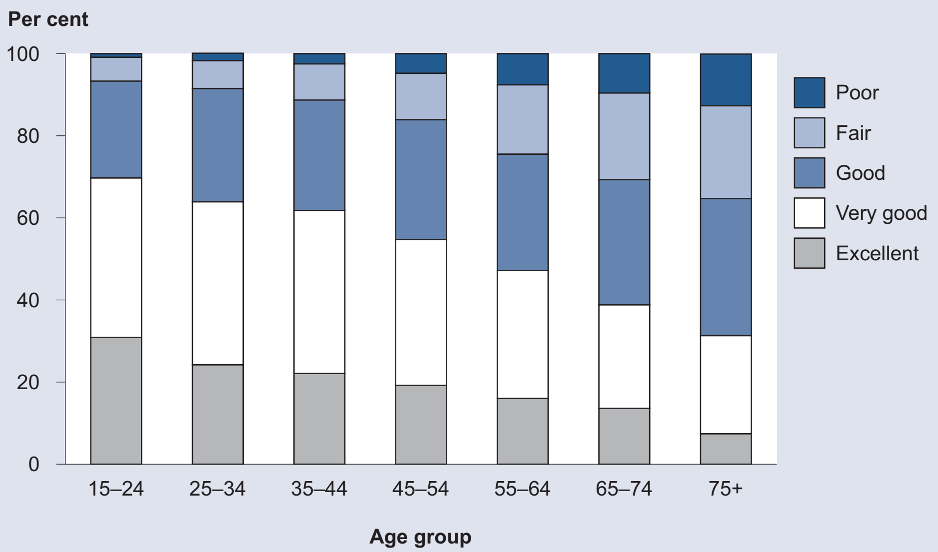
	Males			Females			Persons		
	1995	2001	2004–05	1995	2001	2004–05	1995	2001	2004–05
Excellent/very good	53.9	50.1	54.7	54.6	52.9	58.1	54.3	51.5	56.4
Good	28.6	31.4	28.8	28.5	29.2	26.9	28.5	30.2	27.8
Fair/poor	17.5	18.5	16.5	16.8	17.9	15.1	17.2	18.2	15.7

(a) Age-standardised to the Australian population as at June 2001.

(b) Persons aged 15 years and over.

Source: ABS 2006a.

Patterns in self-ratings of health were similar for males and females but differed by age group. Generally, the proportions of people reporting excellent or very good health decreased with age (Figure 2.5).

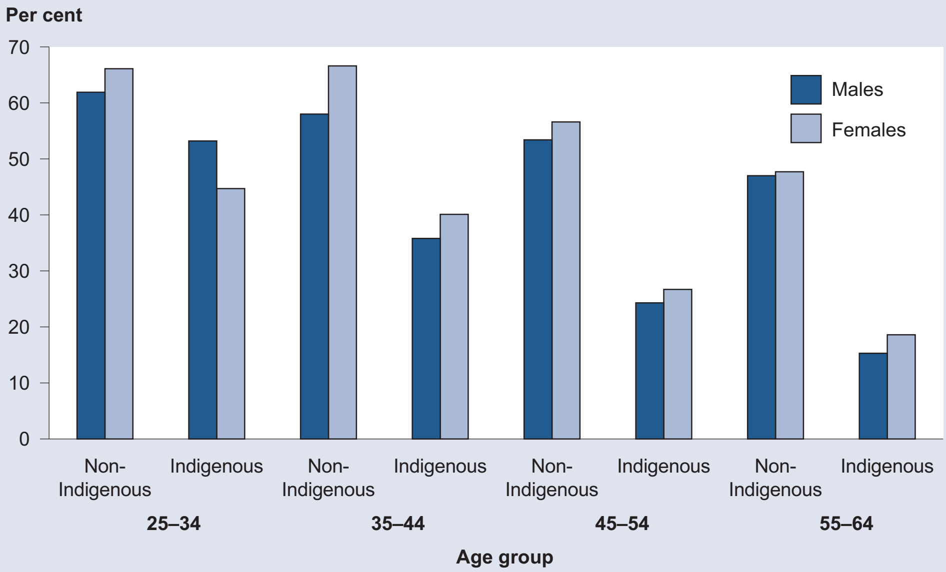


Note: Persons aged 15 years and over.

Source: ABS 2006a.

Figure 2.5: Self-assessed health status, by age group, 2004–05 (per cent)

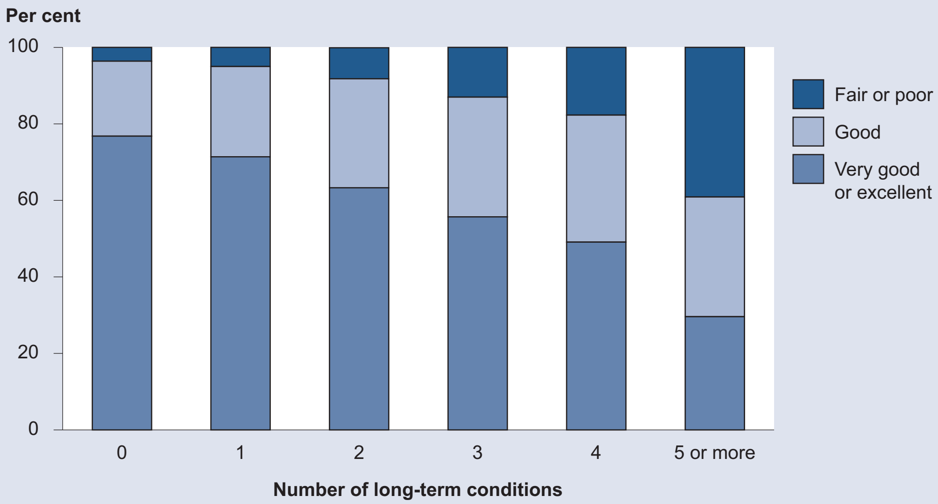
It is widely documented that the Indigenous peoples of Australia do not enjoy as good health as other Australians. This is also supported by results from the 2004–05 National Aboriginal and Torres Strait Islander Health Survey (ABS 2006c). These show that the proportions of Indigenous Australians who reported excellent or very good health were markedly lower than for non-Indigenous Australians, with the differences widening with age (Figure 2.6).



Source: ABS 2006c.

Figure 2.6: Proportion of people rating their health as very good or excellent, by age group and Indigenous status, 2004–05

How people rated their health was also associated with the number of long-term conditions they reported (Figure 2.7). The more long-term conditions a person had, the more likely they were to rate their health less favourably than those who reported fewer conditions.



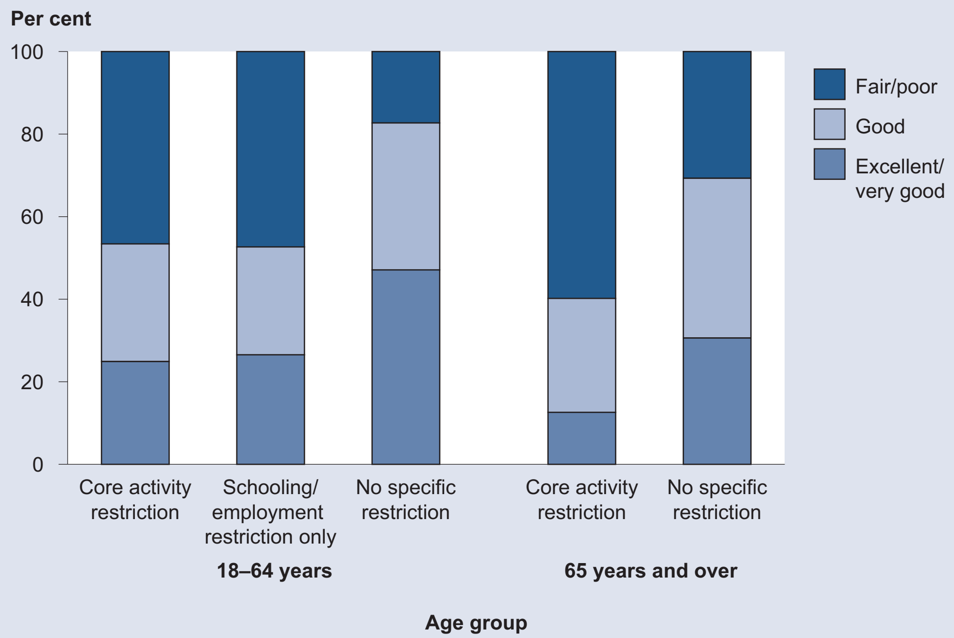
Notes

1. Persons aged 15 years and over.
2. Conditions are self-reported.

Source: AIHW analysis of the ABS 2004–05 NHS.

Figure 2.7: Self-assessed health status, by number of long-term conditions, 2004–05

As with long-term conditions, a person's rating of his or her health differed by whether the person had an activity restriction or not (see Section 2.4 for an explanation of this and related terms). In 2006, those who reported a restriction were much more likely to rate their health as fair or poor (Figure 2.8). Being older as well as having an activity restriction had the most influence on how people rated their health. Sixty per cent of those who were aged 65 years and over, and had a restriction, rated their health as fair or poor. In contrast, 30% of those the same age but without a restriction assessed themselves at that level.



Note: Employment restrictions relate to persons aged 18–64 years only, and schooling restrictions relate to persons aged 18–20 years only. Persons were classified as having only a schooling or employment restriction if no other core activity limitations were reported.

Source: ABS 2007a.

Figure 2.8: Self-assessed health status, by activity restrictions and age group, 2006

A relationship also exists between self-assessed health and certain health behaviours (Table 2.6). For example, those who reported healthy lifestyle behaviours, such as never smoking, were more likely to rate their health as excellent or very good than those whose behaviours were negative (for example, those who smoked daily). Some health behaviours may not necessarily be the result of personal choice. For example, for some people, ill health or disability may stop them participating in some or all forms of exercise.

Table 2.6: Excellent or very good self-assessed health status, by selected health behaviours[a], 2004–05 (per cent)

	Self-assessed health status		
Health behaviour	**Excellent/very good**	**Good**	**Fair/poor**
Exercise level			
High level	75.8	17.9	6.3
Sedentary	44.9	31.9	23.2
Alcohol intake[b]			
Low risk	58.5	27.9	13.7
High risk	47.8	32.7	19.5
Type of milk usually consumed			
Low or reduced fat	58.3	27.9	13.8
Whole or full cream	51.7	30.0	18.4
Usual daily serves of vegetable			
Four or more serves	60.3	25.3	14.4
Doesn't eat vegetables	38.8	32.7	28.5
Usual daily serves of fruit			
Two or more serves	58.6	27.1	14.2
Doesn't eat fruit	44.2	32.3	23.5
Body weight[c]			
Normal weight	61.7	25.3	13.0
Obese	40.6	35.1	24.3
Smoker status			
Never smoked	59.6	27.0	13.5
Current daily smoker	43.4	33.2	23.4

(a) Persons aged 18 years and over.

(b) Based on Australian Alcohol Guidelines, NHMRC 2001.

(c) Based on body mass index calculated from self-reported height and weight.

Notes

1. Based on self-reported information.
2. Data are age-standardised to the 2004–05 NHS population.

Source: AIHW analysis of the ABS 2004–05 NHS.

2.3 Long-term conditions

In 2004–05, an estimated 77% of Australians had a long-term condition; that is, a disease or other health problem that had lasted, or was expected to last, 6 months or more. The proportion reporting long-term conditions in the 2004–05 NHS increased with age, from 41% of those aged less than 15 years to over 95% of persons aged 45 years and over.

The most commonly reported conditions were sensory impairments and diseases (notably, vision and hearing problems), back pain and disc problems, hay fever and allergic rhinitis, and arthritis (Table 2.7). The same types of conditions were commonly reported by both sexes, but most conditions were more likely to be reported by females than males. The exceptions to this were deafness, high cholesterol, and back pain and disc problems, which were more common among males.

Table 2.7: Commonly reported long-term conditions, 2004–05

	Males		Females	
Condition	**Per cent**	**Rank**	**Per cent**	**Rank**
Long-sightedness	24.3	1	29.9	1
Short-sightedness	19.2	2	25.0	2
Back pain & disc problems(a)	16.0	3	14.7	4
Hay fever & allergic rhinitis	15.0	4	17.2	3
Deafness	13.3	5	7.2	10
Hypertensive disease	10.2	6	11.1	6
Asthma	9.0	7	11.5	5
Chronic sinusitis	7.5	8	10.9	7
High cholesterol	7.0	9	6.6	12
Osteoarthritis	6.1	10	9.6	8
Migraine	3.8	20	9.3	9

(a) Includes back problems not elsewhere classified.

Source: ABS 2006a.

Age-specific distributions

The types of long-term conditions that people reported varied with age (Table 2.8). For example, conditions such as asthma and hay fever (and rhinitis) were common in the younger age groups, whereas arthritis and hypertensive diseases (high blood pressure or related conditions) featured as common conditions for those aged 55 years and over. Long- and short-sightedness were common in most age groups.

It is interesting to note that the long-term conditions that dominate in certain age groups (for example, arthritis in older age groups) are not the conditions that are common causes of death in those age groups (see Section 2.5). However, some of these conditions commonly feature as those that contribute to disability. For example, chronic respiratory conditions (which include asthma) are the second highest cause of prevalent disability in those aged 0–24 years, and arthritis and back pain are common causes of prevalent disability in those aged 65 years and over.

Table 2.8: Five most commonly reported long-term conditions, by age group, 2004–05

Age group	Condition	Per cent[(a)]	Age group	Condition	Per cent[(a)]
0–14	Asthma	11.5	45–54	Long-sightedness	52.2
	Hay fever & allergic rhinitis	7.7		Short-sightedness	30.5
	Allergy (undefined)	6.2		Back pain & disc problems[(b)]	22.5
	Long-sightedness	3.7		Arthritis (all types)	20.0
	Short-sightedness	3.5		Hay fever & allergic rhinitis	19.3
15–24	Hay fever & allergic rhinitis	19.4	55–64	Long-sightedness	63.0
	Short-sightedness	17.9		Arthritis (all types)	38.6
	Asthma	12.4		Short-sightedness	36.5
	Back pain & disc problems[(b)]	9.1		Hypertensive diseases	26.4
	Long-sightedness	8.8		Back pain & disc problems[(b)]	26.1
25–34	Short-sightedness	22.3	65–74	Long-sightedness	63.8
	Hay fever & allergic rhinitis	22.0		Arthritis (all types)	49.0
	Back pain & disc problems[(b)]	15.3		Hypertensive diseases	38.0
	Chronic sinusitis	11.3		Short-sightedness	35.7
	Asthma	10.7		Deafness	26.5
35–44	Short-sightedness	21.6	75+	Long-sightedness	59.3
	Back pain & disc problems[(b)]	21.6		Arthritis (all types)	49.9
	Hay fever & allergic rhinitis	20.3		Deafness	42.2
	Long-sightedness	14.7		Hypertensive diseases	41.3
	Chronic sinusitis	11.6		Short-sightedness	34.4

(a) The proportion in each age group who reported that long-term condition.

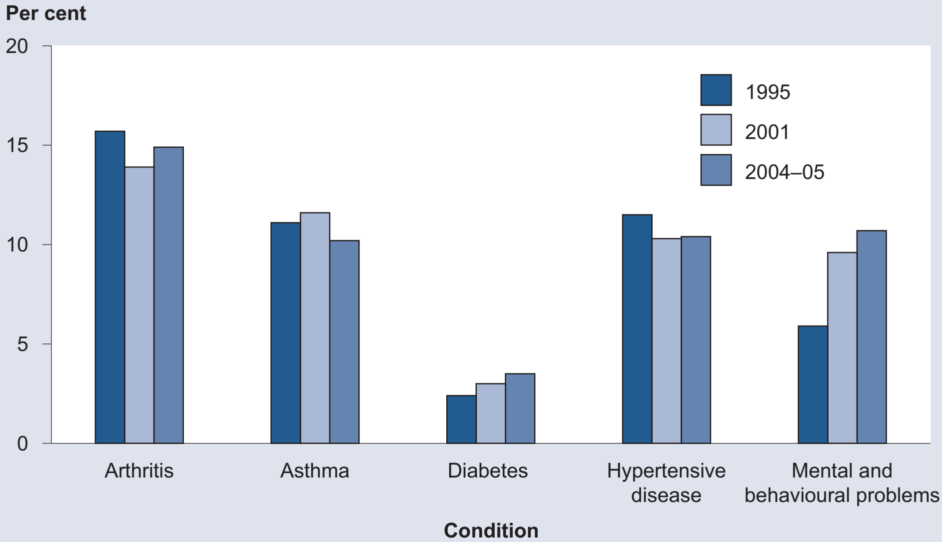
(b) Includes back problems not elsewhere classified.

Source: ABS 2006a.

Trends in prevalence

The last three NHSs provide insight into trends in self-reported long-term conditions in the community. For many conditions, the proportions who report them remain similar over time—for example, the chronic conditions of hypertensive disease and arthritis (Figure 2.9). For other conditions (such as diabetes and mental and behavioural problems) increases in the proportions reporting them are evident.

More information about specific conditions can be found in Chapter 5.



Notes

1. Based on self-reported information.
2. Data are age-standardised to the 2001 Australian population.

Source: ABS 2006a.

Figure 2.9: Selected long-term conditions, 1995 to 2004–05

2.4 Functioning and disability

A basic aspect of our health and wellbeing is how well we function from day to day. Do we feel sufficiently energetic and well? Can we move around and can we feed, dress and generally take care of ourselves? How well can we communicate with others, and can we take part in work and wider social activities?

Diseases and injuries can often impair how a person functions for a while, but mostly the person recovers fully. Everyone has had this experience. However, for some people the effect can be long term because there is residual damage or the health condition is chronic. Alternatively, a person may have some permanent damage or defect from birth. In these cases, the resulting disability may bring special needs for assistance in the person's daily life.

How people experience and cope with disability can be greatly affected by the opportunities and services provided for them (WHO 2001). For example, are buildings and public transport designed so that people with wheelchairs can gain access to them? And do people have access to wheelchairs in the first place, or to other technical aids or personal assistance? Do policies make it easier for people with disability to be employed where possible? These factors can all reduce a person's effective level of disability and support their participation in society.

This section provides an overview of disability prevalence in Australia along with how people describe the nature of their disability and what they see as its causes. It also discusses the need for assistance for activities and how far this need is being met among Australians with disability.

Box 2.4: The Survey of Disability, Ageing and Carers (SDAC)

Conducted by the ABS, the SDAC collects information on people with disability, older people (aged 60 years or over), and people who care for an older person or a person with disability (ABS 2004). The survey is conducted every 5 years (with surveys in 1988, 1993, 1998 and 2003), and covers people in private and non-private dwellings. This includes people in cared accommodation establishments, but excludes those in correctional institutions. The survey collects data on disability owing to impairments, activity limitations and participation restrictions, health status, causes of disability, the need for and receipt of assistance with various activities, and information about caring and its impacts on the carer.

How many Australians have a disability?

To help plan services for people with disability, and to track progress over time, we need good measures of the levels and trends of disability in Australia. Technically, we can describe disability in relation to several categories: as an impairment in body structure or function; as a limitation in activities (such as mobility and communication); or as a restriction in participation (involvement in 'life situations' such as social interaction and work). These can all exist in varying degrees and combinations but there needs to be a well-accepted definition for the purposes of measurement.

The ABS 2003 Survey of Disability, Ageing and Carers (SDAC; Box 2.4), along with its predecessors, is used to measure national disability prevalence and related factors. From the SDAC, an estimated 3.9 million Australians (20% of the population) had some form of disability in 2003. To be defined as having a disability, a respondent to the survey needed to report having at least one of a list of impairments, health conditions or limitations that had lasted—or was likely to last—for at least 6 months, and that restricted everyday activities.

The 2003 SDAC collected information about the nature and severity of specific activity limitations or restrictions in 'core activities' (self-care, mobility and communication), and in schooling or employment. Over 1.2 million people, or 6.3% of Australians, had a severe or profound core activity limitation, meaning that they sometimes or always needed personal assistance or supervision with the core activities of daily living (*NHPC indicator 1.03*) (Table 2.9).

Table 2.9: All people with disability, by age and severity of core activity limitation, 2003

	Core activity limitation						
Age	Severe or profound	Moderate	Mild	Schooling or employment restriction only[(a)]	Total with specific limitation or restriction	Without specific limitation or restriction	Total with disability
				Number ('000)			
0–64	677.7	436.5	626.7	384.1	2,125.1	430.9	2,556.0
65+	560.9	262.2	430.4	. .	1,253.5	136.9	1,390.4
Total	**1,238.6**	**698.7**	**1,057.1**	**384.1**	**3,378.6**	**567.8**	**3,946.4**
				Per cent[(b)]			
0–64	3.9	2.5	3.6	2.2	12.3	2.5	14.8
65+	22.5	10.5	17.2	. .	50.2	5.5	55.7
Total	**6.3**[(c)]	**3.5**	**5.4**	**1.9**	**17.1**	**2.9**	**20.0**

(a) Schooling or employment restriction relates to people aged 5–64 years.

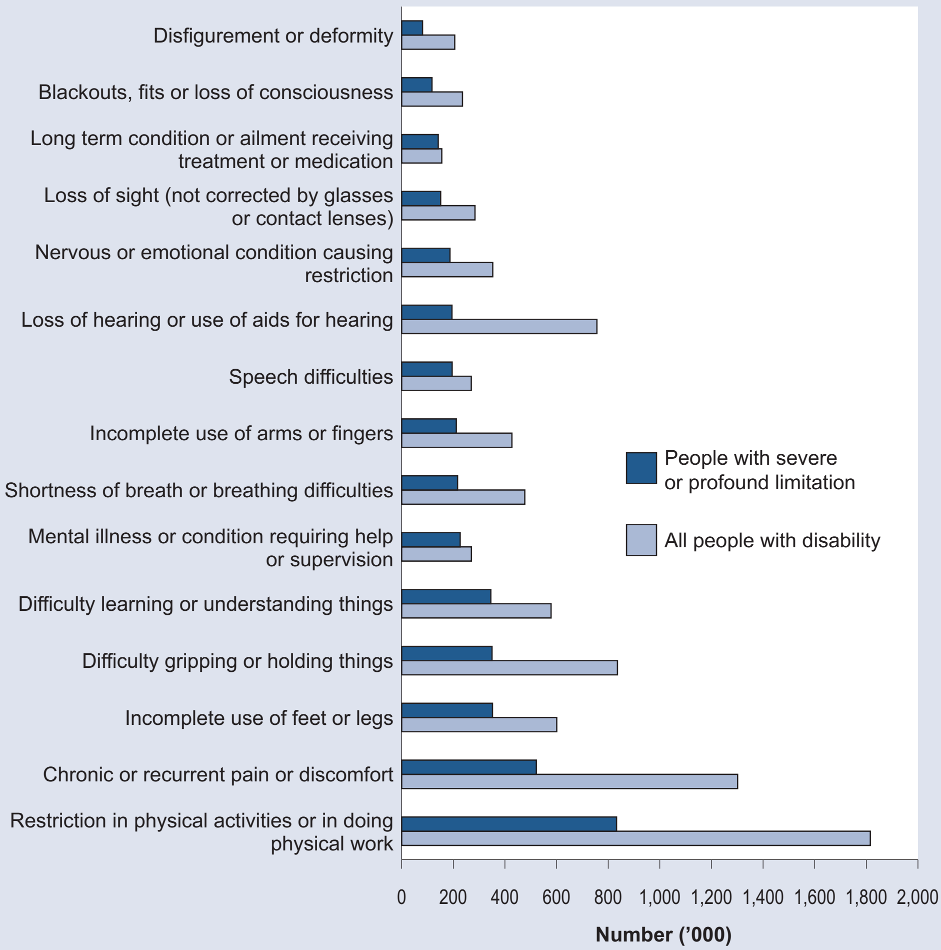
(b) Per cent of the Australian population of that age.

(c) Relates to *NHPC indicator 1.03*: Severe or profound core activity limitation, people aged 5 years and over.

Source: AIHW analysis of ABS 2003 SDAC confidentialised unit record file.

What types of problems do people with disability have?

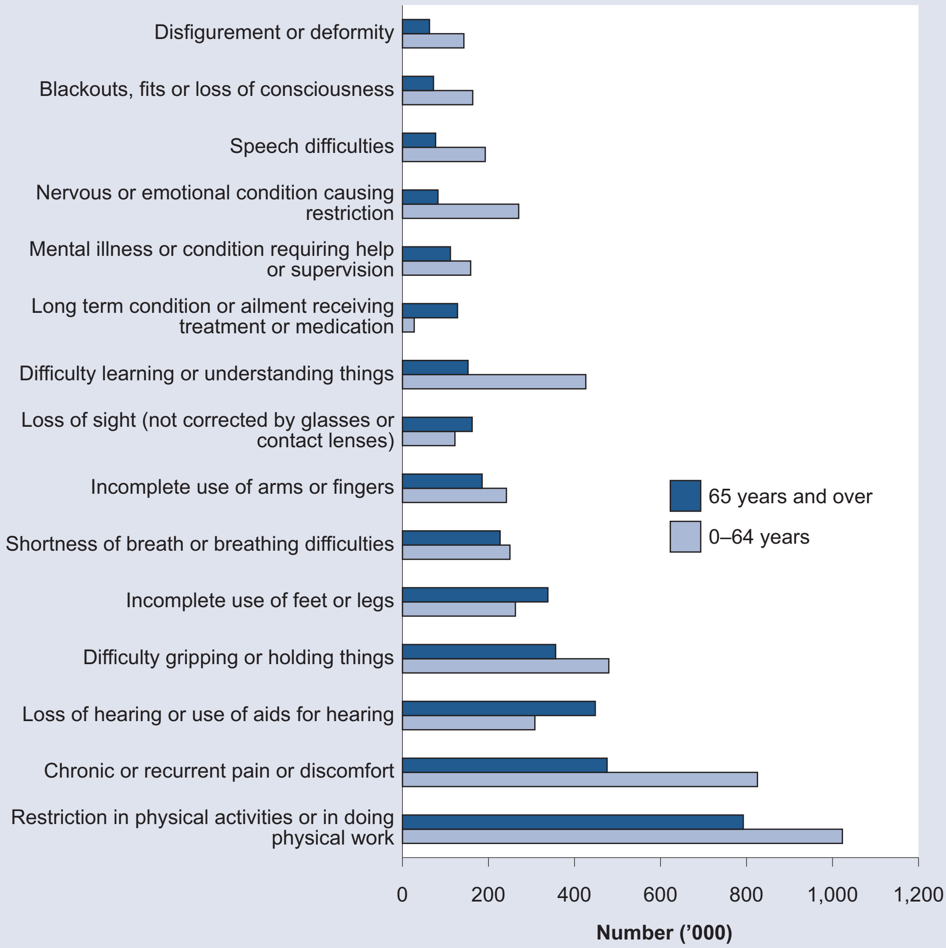
The most common types of impairments or limitations reported by respondents to the 2003 SDAC were 'restriction in physical activities or in doing physical work' (1.8 million people) and 'chronic or recurrent pain or discomfort' (1.3 million people) (Figure 2.10). These also headed the list for people of all ages with a severe or profound core activity limitation, with an estimated 832,400 such people having 'restriction in physical activities or in doing physical work' and an estimated 521,600 having 'chronic or recurrent pain or discomfort'.



Source: AIHW analysis of ABS 2003 SDAC confidentialised unit record file.

Figure 2.10: People with disability: specific impairments or limitations, by severity of disability, 2003

When comparing the types of limitations reported by people of different ages, 'restriction in physical activities or in doing physical work' and 'chronic or recurrent pain or discomfort' were again the most common for those both above and below the age of 65 years (Figure 2.11). 'Difficulty gripping or holding things' was the third most commonly reported limitation for people aged under 65, compared with 'loss of hearing or use of aids for hearing' for those aged 65 years and over. 'Difficulty learning or understanding things' and 'nervous or emotional condition causing restriction' were more commonly reported among people aged under 65 years (fourth and sixth), compared with those aged 65 years and over (ninth and twelfth).



Source: AIHW analysis of ABS 2003 SDAC confidentialised unit record file.

Figure 2.11: People with disability: specific impairments or limitations, by age, 2003

Cause of main disabling condition

The 2003 SDAC respondents were also asked about their main disabling conditions and the causes of these conditions. For people with multiple conditions, the main disabling condition is defined as the one causing the most problems. If only one disabling condition was reported, this was recorded as the main disabling condition.

A wide range of physical conditions and mental and behavioural disorders can lead to disability. The causes of these disabling conditions and disorders are complex, ranging from genetic disorders to environmental factors; in many cases no specific cause is identified. Of all people with disability, about 11% did not know what caused the disabling condition and 22% reported that it 'just came on' (Table 2.10). Accident or injury (15%) and disease, illness or hereditary disorders (14%) were the most commonly reported known causes of disabling conditions, followed by work-related causes (11%).

Among people aged under 65 years, accident or injury was the most common known cause (19%), whereas 'old age' was the most common cause reported by those aged 65 years and over (16%). Work-related causes were more common among people aged under 65 years (12%) than among those aged 65 years and over (9%). A notable proportion of people aged under 65 years reported conditions present at birth as the causes of disability (11%).

Accident or injury was the top known cause of disability for males (18%), whereas disease, illness or hereditary causes led for females (16%). Males were more likely than females to have work-related disabilities (15% versus 6%).

Table 2.10: People with disability: cause of main disabling condition, by age and sex

	0–64		65+		Male		Female		Total	
	No. ('000)	Per cent	No. ('000)	Per cent	No. ('000)	Per cent	No. ('000)	Per cent	No. ('000)	Per cent
Main condition just came on	503.7	19.7	379.1	27.3	364.2	18.7	518.6	26.0	882.8	22.4
Accident or injury	478.1	18.7	118.8	8.5	357.4	18.3	239.5	12.0	596.9	15.1
Disease or illness or hereditary	344.2	13.5	210.2	15.1	238.9	12.2	315.6	15.8	554.5	14.1
Working conditions or work or overwork	305.7	12.0	117.8	8.5	300.4	15.4	123.1	6.2	423.5	10.7
Present at birth	270.5	10.6	12.9	0.9	165.4	8.5	118.0	5.9	283.5	7.2
Old age	20.7	0.8	216.6	15.6	85.6	4.4	151.8	7.6	237.3	6.0
Personal or family problems or death	73.8	2.9	13.3	1.0	28.1	1.4	59.0	3.0	87.1	2.2
Stress	53.6	2.1	15.6	1.1	26.2	1.3	43.1	2.2	69.2	1.8
Smoking	18.5	0.7	39.8	2.9	36.3	1.9	21.9	1.1	58.2	1.5
Side effect of medication or medical procedure	28.0	1.1	28.1	2.0	25.4	1.3	30.7	1.5	56.1	1.4
Allergy (for example, to food, medication or environment)	30.1	1.2	9.8	0.7	14.2	0.7	25.7	1.3	40.0	1.0
War or peacekeeping service	14.3	0.6	20.1	1.4	31.5	1.6	*2.8	*0.1	34.3	0.9
Own pregnancy or childbirth	20.2	0.8	*4.7	*0.3	. .	. .	24.8	1.2	24.8	0.6
Overweight	*5.0	*0.2	**1.6	**0.1	*3.0	*0.2	*3.6	*0.2	*6.6	*0.2
Other cause	99.0	3.9	67.1	4.8	79.7	4.1	86.4	4.3	166.1	4.2
Don't know	290.6	11.4	134.8	9.7	194.3	10.0	231.1	11.6	425.4	10.8
Total	**2,556.0**	**100.0**	**1,390.4**	**100.0**	**1,950.6**	**100.0**	**1,995.8**	**100.0**	**3,946.4**	**100.0**

* Subject to high standard errors (relative standard error of 25–50%) and should be used with caution.

** Subject to sampling variability too high for practical purposes (relative standard error greater than 50%).

Source: AIHW analysis of ABS 2003 SDAC confidentialised unit record file.

Note that these responses may or may not reflect professional assessment. A person with an early-onset condition who has learnt to cope with it might find a different, recently acquired condition more disabling and report this as the main condition.

Activities needing assistance

Among SDAC respondents living in households (as distinct from those living in residential care facilities), an estimated 1.1 million people with a severe or profound core limitation needed assistance with at least one of ten specific activities (Table 2.11). Of these, 649,500 people were aged under 65, and 405,100 were aged 65 years and over. Overall, mobility (806,400 people or 76%) and health care (591,700 people or 55%) were the two most commonly reported activities requiring assistance.

There are differences in the profile of need for assistance between people aged under 65 years and those aged 65 and over (Table 2.11). People aged under 65 years with a severe or profound core activity limitation living in households most commonly needed help with mobility (71%), self-care (48%), cognition or emotion (48%) and health care (46%). Among those aged 65 years and over, mobility (76%), transport (73%) and property maintenance (71%) were the most commonly reported activities with which help was needed.

Table 2.11: People with severe or profound core activity limitation living in households, by age group and activity type needing assistance, 2003

	Age group			Age group		
	0–64	**65+**	**All ages**	**0–64**	**65+**	**All ages**
	Per cent[(a)]			**Number ('000)**		
Self-care	48.2	51.1	49.3	318.6	207.9	526.5
Mobility	70.5	83.5	75.5	466.6	339.8	806.4
Communication	23.8	8.8	18.1	157.3	35.7	193.0
Cognition or emotion	47.9	26.3	39.7	316.8	107.2	424.0
Health care	46.2	70.4	55.4	305.4	286.3	591.7
Paperwork	19.1	31.8	24.0	126.6	129.5	256.1
Transport	40.6	73.3	53.0	268.3	298.3	566.7
Housework	39.3	69.3	50.7	259.6	281.9	541.5
Property maintenance	42.1	71.6	53.4	278.5	291.5	570.0
Meal preparation	17.6	36.1	24.6	116.2	146.9	263.0
Total needing assistance[(b)]	**98.2**	**99.6**	**98.7**	**649.5**	**405.1**	**1,054.7**
Total with severe or profound core activity limitation	**100.0**	**100.0**	**100.0**	**661.4**	**406.9**	**1,068.4**

(a) Per cent needing assistance with the activity.

(b) The total number of people needing assistance is less than the sum of activity types since people may need help with more than one activity.

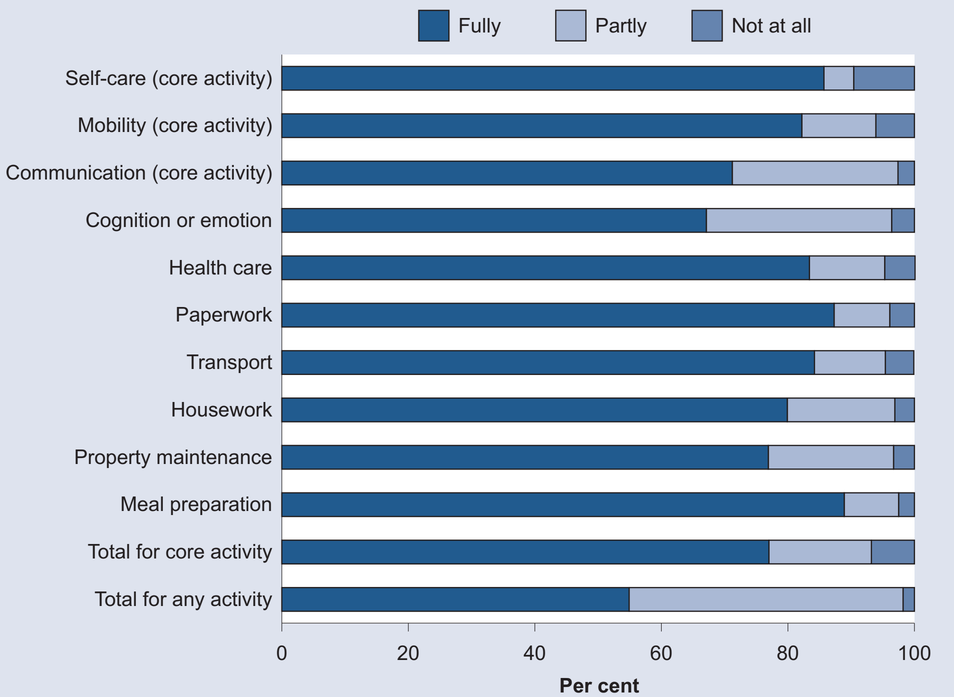
Source: AIHW analysis of ABS 2003 SDAC confidentialised unit record file.

Are needs for assistance being met?

Of the 1.1 million people living in households who needed help with core or other activities, just over half (579,300, or 55%) had their needs fully met and 456,200 (43%) had their needs only partly met. Of the 1 million people who needed help with a core activity (self-care, mobility or communication), 802,200 (77%) had their needs fully met and 169,300 (16%) had their needs partly met (Figure 2.12). About 1 in 14 (7%) individuals needing help with a core activity felt that their needs were not being met at all.

It is noteworthy that the overall proportion having their needs fully met across all activities was substantially lower than the proportion having needs met for some specific activities (Figure 2.12). For example, about 77% of all people needing help with one or more core activities had all their needs fully met, compared with 86% of those needing help with self-care and 82% with mobility. Similarly, 55% of all people needing help with any activity (either core or non-core activities or both) had all their needs fully met, compared with the substantially higher proportions of people who had their needs met for various specific activities. The data relating to the overall extent to which need for help was met (the bottom two bars in Figure 2.12) summarise the survey responses relating to various areas of activity. For example, people needing help with all three core activities are only counted as having their needs fully met overall if they are met for all three.

The variation seen between specific activities may be due to two main reasons. First, some services may be provided more readily or consistently than others. Second, people's limitations and their needs can be complex, and they may find it difficult to navigate an often complex system of support services.



Note: People with a severe or profound core activity limitation living in households.

Source: AIHW analysis of ABS 2003 SDAC confidentialised unit record file.

Figure 2.12: Extent to which need for assistance was met for various activities, 2003

2.5 Causes of death

This section provides an overview of the leading causes of death in Australia and trends in causes of death over the last century. It also considers the impact of premature and avoidable deaths.

Cause of death statistics are usually based on the 'underlying cause', which is the disease or injury that initiated the train of events leading directly to an individual's death—in other words, the condition believed to be the primary cause of death. Any other condition or event that is not the underlying cause, but is still considered to contribute to the death, is known as an associated cause. In Australia, the underlying cause is derived from information on death certificates, using an automated process.

Leading causes of death

For the population as a whole, the top 20 causes have been listed as specific causes rather than at the broader International Classification of Diseases (ICD) chapter level (Box 2.5). Information on cancer deaths, for example, has been provided by individual cancer type rather than for cancer overall.

Box 2.5: Classifying causes of death

The major causes of death are coded according to the 10th revision of the ICD (ICD-10; WHO 1992). ICD-10 categorises diseases into 21 broad groupings (chapters) on the basis of type of condition or body system. Causes of death can be further subdivided either on the basis of similar disease causation (for example, infectious diseases) or into specific entities (for example tuberculosis, breast cancer or AIDS). Commonly accepted groupings have been used in this report.

The top 20 specific causes of death were responsible for about 74% of all deaths in 2005 (Table 2.12). Coronary heart disease (also known as ischaemic heart disease: heart attack and related disorders) was the leading specific cause of death in both sexes and accounted for nearly one-fifth of all deaths that year.

Lung cancer and cerebrovascular disease (notably stroke) were the second and third leading cause of male deaths, followed by 'other heart diseases', a category which includes heart failure. In contrast, cerebrovascular disease and 'other heart diseases' were the second and third leading cause of death among females, followed by dementia and related disorders.

Lung cancer, chronic obstructive pulmonary disease (COPD), colorectal cancer and diabetes were among the top 10 leading causes of death in both sexes. In females, pneumonia and influenza also constituted a leading cause of death, and cancers with an unknown primary site and suicide were prominent among the males. Prostate cancer and breast cancer were significant sex-specific causes of deaths.

Table 2.12: Leading underlying causes of death, all ages, specific causes, 2005

	Males			Females		
Rank	Cause of death (code)	Number of deaths	Per cent all male deaths	Cause of death (code)	Number of deaths	Per cent all female deaths
1	Coronary heart disease (I20–I25)	12,433	18.5	Coronary heart disease (I20–I25)	11,137	17.5
2	Lung cancer (C33–C34)	4,694	7.0	Cerebrovascular disease (I60–I69)	6,845	10.8
3	Cerebrovascular disease (I60–I69)	4,668	6.9	Other heart diseases (I05–I09, I11, I13, I26, I27, I30–I52)	4,378	6.9
4	Other heart diseases (I05–I09, I11, I13, I26, I27, I30–I52)	3,249	4.8	Dementia and related disorders (F01–F03, G30–G32)	3,277	5.2
5	Prostate cancer (C61)	2,946	4.4	Breast cancer (C50)	2,719	4.3
6	Chronic obstructive pulmonary disease (J41–J44)	2,832	4.2	Lung cancer (C33–C34)	2,705	4.3
7	Colorectal cancer (C18–C21)	2,330	3.5	Chronic obstructive pulmonary disease (J41–J44)	2,054	3.2
8	Unknown primary site cancers (C76–C80, C26, C39)	1,785	2.7	Colorectal cancer (C18–C21)	1,841	2.9
9	Diabetes (E10–E14)	1,775	2.6	Diabetes (E10–E14)	1,754	2.8
10	Suicide (X60–X84)	1,657	2.5	Pneumonia and influenza (J10–J18)	1,703	2.7
11	Dementia and related disorders (F01–F03, G30–G32)	1,496	2.2	Unknown primary site cancers (C76–C80, C26, C39)	1,593	2.5
12	Pneumonia and influenza (J10–J18)	1,331	2.0	Diseases of the arteries, arterioles and capillaries (I7)	1,169	1.8
13	Diseases of the arteries, arterioles and capillaries (I7)	1,217	1.8	Pancreatic cancer (C25)	1,055	1.7
14	Land transport accidents (V00–V89)	1,167	1.7	Renal failure (N17–N19)	1,003	1.6
15	Liver diseases (K70–K77)	1,002	1.5	Ovarian cancer (C56)	884	1.4
16	Pancreatic cancer (C25)	963	1.4	Musculoskeletal and connective tissue disorders (M001–M99)	731	1.2
17	Renal failure (N17–N19)	883	1.3	Lymphomas (C81–C85, C96)	694	1.1
18	Melanoma (C43)	862	1.3	Leukaemia (C91–C95)	614	1.0
19	Leukaemia (C91–C95)	800	1.2	Uterine cancer (C53–C55)	566	0.9
20	Oesophageal cancer (C15)	791	1.2	Exposure to unspecified factor (X59)	560	0.9
	Total 20 leading causes	**48,881**	**72.7**	**Total 20 leading causes**	**47,282**	**74.5**
	All deaths	**67,241**	**100.0**	**All deaths**	**63,473**	**100.0**

Note: Codes refer to the International Classification of Diseases, 10th revision (ICD-10).

Source: AIHW National Mortality Database.

Major causes of death by life stage

The statistics for various age groups are provided at the broad ICD chapter level, rather than at the specific disease level, to give a better picture of the broad distribution of causes of death. The relative contribution of different underlying causes of death varies with age (Table 2.13). Conditions emerging from the perinatal period dominate the infant mortality statistics, followed by congenital anomalies. Injury and poisoning is the most common cause of death in the age groups 1–14 years and 15–24 years. The changes in leading causes of death as age increases reflect both longer exposure to various environmental factors and the underlying ageing processes. Among those aged 25–44 years, injury and poisoning is the leading cause of death in males, but cancer takes over as the leading cause of death among females. In both sexes, cancer is the most common cause of death among those aged 45–64 years, followed by cardiovascular disease, which includes both coronary heart disease and stroke. Cancer and cardiovascular disease are again the two most common causes among those aged 65–84 years, but cardiovascular disease dominates the 85 and over age group.

Respiratory diseases are significant contributors to death among those in advancing age. Prominent among these is COPD, a leading specific contributor to deaths overall.

Table 2.13: Leading underlying causes of death, by age group, broad causes, 2005

	Males		Females	
Age group	Cause of death	Per cent of deaths[(a)]	Cause of death	Per cent of deaths[(a)]
Infants (less than one year)	Conditions emerging from the perinatal period	52.1	Conditions emerging from the perinatal period	50.2
	Congenital anomalies	22.5	Congenital anomalies	24.8
	Ill defined	11.1	Ill defined	11.1
	Injury and poisoning	2.4	Injury and poisoning	2.4
1–14	Injury and poisoning	35.9	Injury and poisoning	35.4
	Cancer	16.7	Cancer	18.4
	Nervous system diseases	9.8	Nervous system diseases	7.2
	Cardiovascular disease	7.8	Ill defined	6.3
			Endocrine	6.3
15–24	Injury and poisoning	75.0	Injury and poisoning	57.1
	Cancer	6.3	Cancer	16.0
	Nervous system diseases	5.1	Nervous system diseases	5.4
	Cardiovascular disease	4.2	Cardiovascular disease	4.3
25–44	Injury and poisoning	51.9	Cancer	35.5
	Cancer	14.1	Injury and poisoning	27.0
	Cardiovascular disease	13.9	Cardiovascular disease	13.5
	Digestive disorders	4.3	Digestive disorders	4.4
45–64	Cancer	42.5	Cancer	57.3
	Cardiovascular disease	26.4	Cardiovascular disease	15.1
	Injury and poisoning	10.5	Injury and poisoning	6.3
	Digestive disorders	5.6	Respiratory system diseases	5.3
65–84	Cancer	38.1	Cardiovascular disease	34.3
	Cardiovascular disease	33.5	Cancer	33.8
	Respiratory system diseases	9.6	Respiratory system diseases	8.6
	Endocrine	4.0	Endocrine	4.7
85+	Cardiovascular disease	44.2	Cardiovascular disease	51.2
	Cancer	20.5	Cancer	12.6
	Respiratory system diseases	12.0	Respiratory system diseases	8.8
	Genitourinary diseases	3.5	Mental disorders	5.2

(a) Per cent of deaths within each age and sex group.

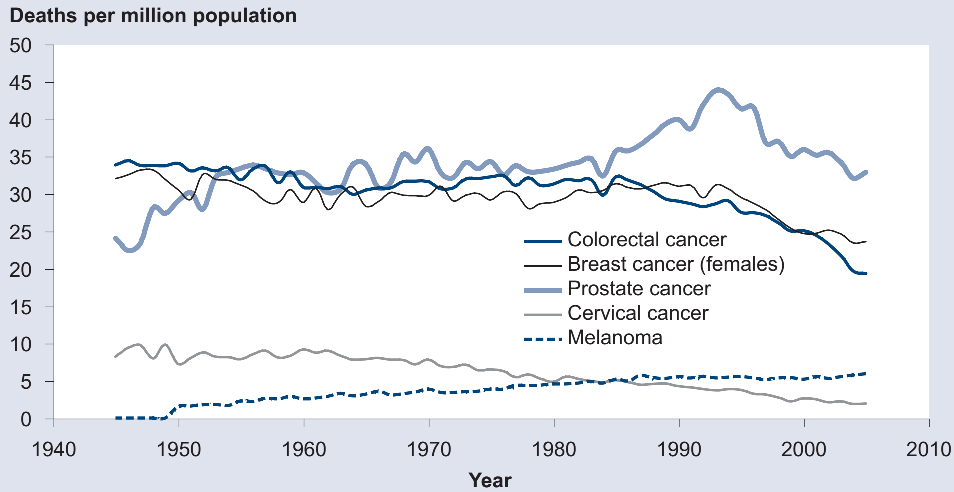
Source: AIHW National Mortality Database.

Trends in mortality

A major feature of mortality trends in Australia is the steady reduction in age-standardised death rates over the last several decades. Overall death rates in Australia have fallen by around two-thirds over the past century. As detailed earlier, the male age-standardised death rate fell by 67% between the early 1900s and 2005, and the corresponding female death rate fell by 73% (see 'Mortality' in Section 2.1). These consistent overall trends, however, mask much variation in underlying trends in cause-specific death rates. Analysing these trends in more detail can provide a valuable guide to the evolution of a nation's health (Jemal et al. 2005).

One of the 20th century's major successes in relation to mortality was the 95% drop in infectious disease deaths (from around 140 per million in the early 1920s to 8 per million in 2005). Reasons for this drop have been widely debated, but probably include improvements in sanitation and living conditions, increased understanding of the causes and transmission of infectious diseases, and the development and widespread application of antibiotics and vaccines (Ausubel et al. 2001). Another oft-cited trend is the rise and fall in cardiovascular disease deaths, which peaked around 1960, with the fall attributed roughly equally to improvements in risk factors and advances in treatment (Capewell et al. 2000).

Death rates from many other diseases have also fallen considerably over the last century, but the sizes of these falls and the periods over which they occurred have varied. For example, the death rate for colorectal cancer was reasonably steady until the late 1980s and has since fallen by around 40%, whereas the death rate for cervical cancer began to fall in the mid-1960s, and has dropped by around 75% since that time (Figure 2.13). Examining these different trends can help us understand the effects of societal, medical and technological changes on the health of the population.

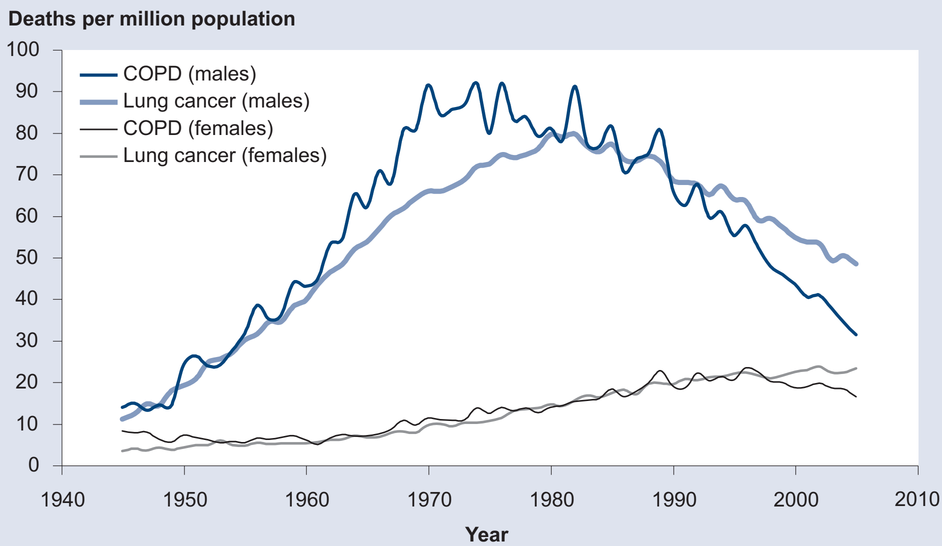


Note: Rates have been age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National GRIM Books.

Figure 2.13: Trends in death rates for selected cancers, 1945 to 2005

Differences in death rates between the sexes can highlight the effects of gender differences in health-related behaviours. For example, the different patterns of lung cancer death rates reflect the different patterns of cigarette smoking between the sexes, along with the decades-long lag in resultant cancers. Death rates for lung cancer among males reflect their widespread and rapid uptake of cigarette smoking in the first half of the 20th century, with the death rate peaking around 1980 then falling following the marked decrease in male smoking prevalence in the second half of the century (Figure 2.14). In contrast, smoking among females was less common than in males and fell much later in the century (Winstanley et al. 1995), leading to a lung cancer death rate that has so far continued to rise gradually. The death rates for chronic obstructive pulmonary disease, a chronic respiratory condition strongly associated with tobacco smoking, show very similar patterns.



COPD = chronic obstructive pulmonary disease.

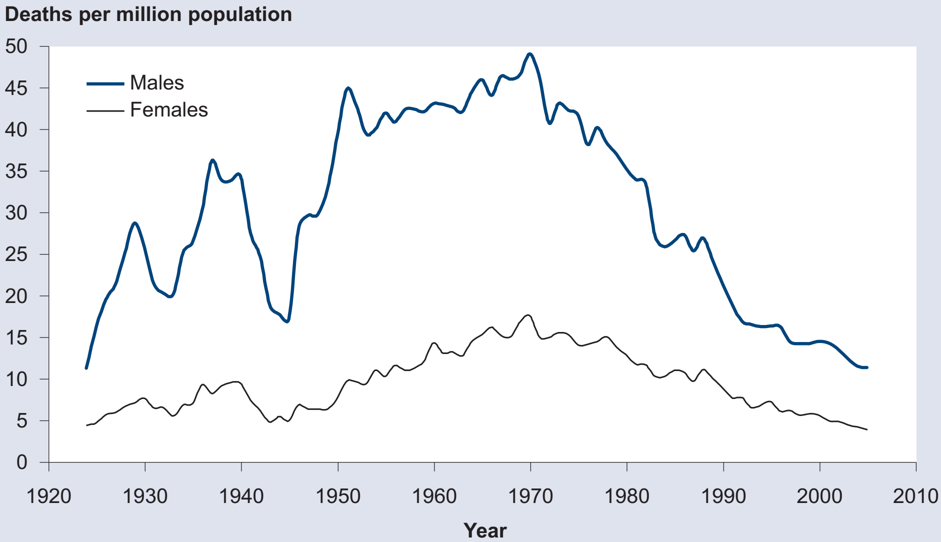
Note: Rates have been age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National GRIM Books.

Figure 2.14: Trends in death rates for lung cancer and COPD, by sex, 1945 to 2005

Looking at 'peak' periods in death rates and combining this with other relevant information can provide insight into the effects of changes in health-related policies, legislation and behaviours. Sometimes the effects of these changes can be rapid. For example, the death rate for motor vehicle accidents began to fall when the wearing of seat belts became compulsory during the early 1970s. Motor vehicle accident death rates for both sexes in 2005 were similar to those seen in the early 1920s, having dropped by almost 80% since 1970 (Figure 2.15).

Death rates can also reflect the success of prevention and treatment strategies—for example, the drop in cervical cancer death rates after the Pap smear became available to Australian females in the 1960s (Figure 2.13). Tracking trends in death rates and identifying changes in the years to come can help to set new priorities for policy, practice and research to improve the health of Australians.



Note: Rates have been age-standardised to the Australian population as at 30 June 2001.

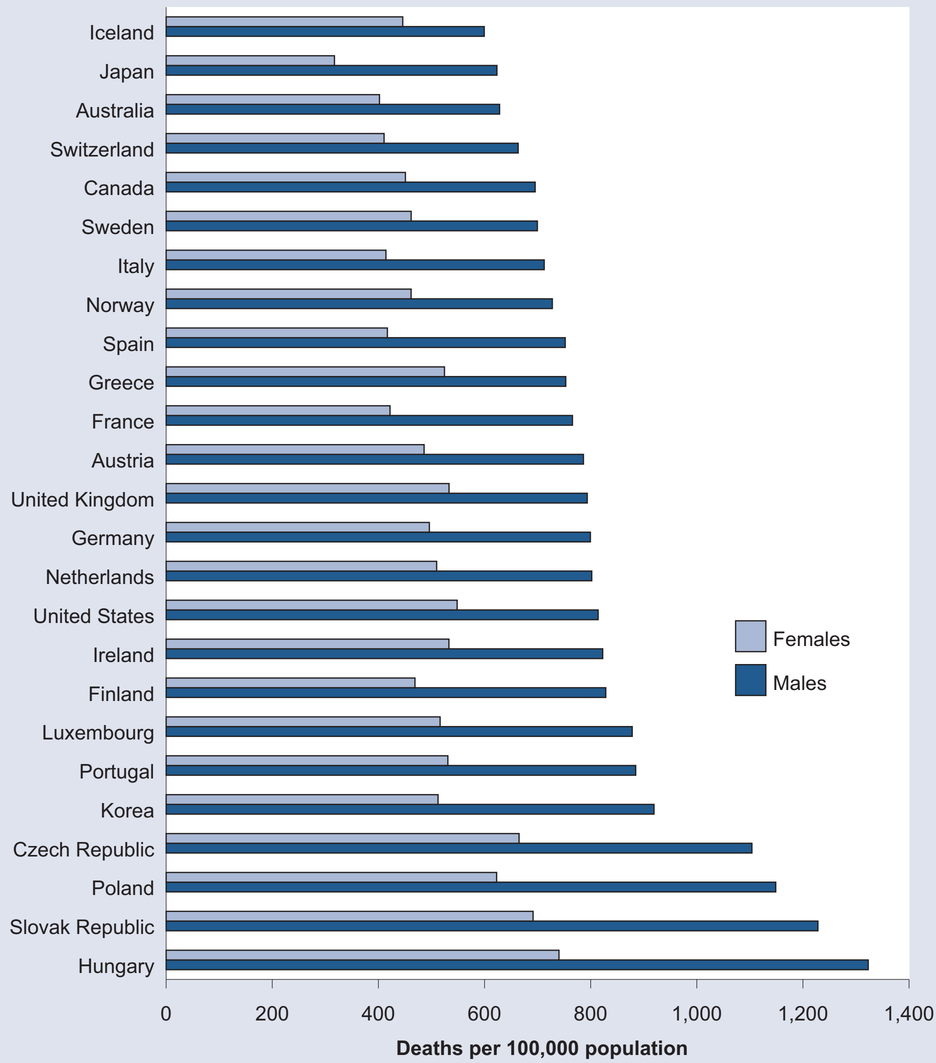
Source: AIHW National GRIM Books.

Figure 2.15: Trends in death rates for motor vehicle accidents, 1924 to 2005

International comparisons

As could be expected from our high life expectancy, Australia's overall death rate compares well with other OECD countries (Figure 2.16). Australia's OECD age-standardised rates of 628 and 402 deaths per 100,000 population in 2003 for males and females, respectively, ranked behind those of Japan (at 623 and 317, respectively, in 2003). Death rates for Icelandic males were lower than those for Australian or Japanese males, although rates for Icelandic females were higher. Death rates in Switzerland were similar to those in Australia. In contrast, the Eastern European countries of Hungary, the Czech and Slovak republics, and Poland had death rates over 50% higher than Australia.

Almost all OECD countries have had large declines in mortality in the last several decades. Since 1960, Japan has seen its male death rate decline by 59% and its female death rate by 70%. Although from a lower base rate than Japan's in 1960, Australia's decline of 53% among males and 54% among females in the same period is also notable. Other countries with significant declines in death rates include Italy, Finland, France and Germany. Death rates in Eastern European countries have begun to decline in more recent years.



Notes

1. Data for Canada, Italy, the Slovak Republic, Sweden, the United Kingdom and the United States are for 2002; data for other countries are for 2003.
2. Rates have been standardised to the OECD 1980 population.

Source: OECD 2007.

Figure 2.16: All-cause death rates among OECD countries, 2002 and 2003

Contributing causes of death

A fuller picture of events and circumstances around the time of death may be generated from 'multiple causes of death' data, made available by the ABS since 1997 (Box 2.6). In addition to the underlying cause of death, other conditions or diseases that played a part in the death are also recorded on the death certificate, and are known as associated causes of death. Considering the contribution that a particular condition or disease makes as either the underlying or an associated cause can provide a fuller picture of its role in leading to deaths in the population. 'Contributing causes of death' include both underlying and associated causes of death.

The rankings of the most common contributing causes of death show the significant toll of cardiovascular diseases on the Australian community, producing the top three specific causes for both males and females (Table 2.14). Cardiovascular diseases as a group contributed to 55% of all male deaths, and 60% of all female deaths.

Table 2.14: Contributing causes of death, all ages, 2005

Rank	Contributing cause of death (code)	Number of mentions[a]	Per cent[b]	Per cent underlying[c]
	Males			
1	Coronary heart disease (I20–I25)	20,111	29.9	61.8
2	Other heart diseases (I05–I09, I11, I13, I26, I27, I30–I52)	18,055	26.9	18.0
3	Cerebrovascular disease (I60–I69)	9,041	13.4	51.6
4	Pneumonia and influenza (J10–J18)	8,548	12.7	15.6
5	Chronic obstructive pulmonary disease (J41–J44)	7,489	11.1	37.8
6	Renal failure (N17–N19)	7,265	10.8	12.2
7	Diabetes (E10–E14)	6,325	9.4	28.1
8	Essential (primary) hypertension (I10)	6,116	9.1	2.0
9	Dementia and related disorders (F01–F03, G30–G32)	5,656	8.4	26.4
10	Lung cancer (C33–C34)	5,016	7.5	93.6
11	Unknown primary site cancers (C76–C80, C26, C39)	4,965	7.4	36.0
12	Other diseases of the respiratory system (J95–J99)	4,770	7.1	5.6
13	Prostate cancer (C61)	4,240	6.3	69.5
14	Diseases of the arteries, arterioles and capillaries (I7)	3,914	5.8	31.1
15	Septicaemia (A40, A41)	3,815	5.7	13.2
	All male deaths	**67,241**		
	Females			
1	Other heart diseases (I05–I09, I11, I13, I26, I27, I30–I52)	19,417	30.6	22.5
2	Coronary heart disease (I20–I25)	17,115	27.0	65.1
3	Cerebrovascular disease (I60–I69)	11,590	18.3	59.1
4	Dementia and related disorders (F01–F03, G30–G32)	10,048	15.8	32.6
5	Pneumonia and influenza (J10–J18)	8,841	13.9	19.3
6	Essential (primary) hypertension (I10)	8,467	13.3	3.4
7	Renal failure (N17–N19)	6,436	10.1	15.6
8	Diabetes (E10–E14)	5,539	8.7	31.7
9	Chronic obstructive pulmonary disease (J41–J44)	4,615	7.3	44.5
10	Other diseases of the respiratory system (J95–J99)	4,260	6.7	6.7
11	Unknown primary site cancers (C76–C80, C26, C39)	4,092	6.4	38.9
12	Diseases of the arteries, arterioles and capillaries (I7)	3,861	6.1	30.3
13	Musculoskeletal and connective tissue disorders (M001–M99)	3,704	5.8	19.7
14	Septicaemia (A40, A41)	3,658	5.8	15.0
15	Breast cancer (C50)	3,432	5.4	79.2
	All female deaths	**63,473**		

(a) Number of times the condition was listed as either the underlying or an associated cause.

(b) Proportion of all deaths where the condition was either the underlying or an associated cause, by sex.

(c) Underlying cause of death listings as a proportion of all contributing cause listings for that specific cause.

Notes

1. Codes refer to the International Classification of Diseases, 10th revision (ICD-10).
2. Numbers and percentages cannot be added within columns because a single death can have multiple contributing causes.

Source: AIHW National Mortality Database.

The rankings also reveal the importance of some chronic conditions that are rarely specified as the underlying cause of death. Hypertension (high blood pressure) contributed to more than 14,500 deaths in 2005 but was the underlying cause in only 410 deaths. Other diseases of the respiratory system and septicaemia also fall into this category.

In contrast, lung cancer was the underlying cause of death in nearly 95% of deaths where it was a contributing cause. Ranked second for males and sixth for females as an underlying cause of death, it drops to sixteenth in the contributing cause of death rankings. Most other cancers, suicide and land transport accidents show similar patterns.

Box 2.6: The National Mortality Database

The AIHW National Mortality Database contains information about all deaths registered in Australia. Deaths are certified by a medical practitioner or the coroner and registered by the Registrar of Births, Deaths and Marriages in each state or territory. The information is provided to the Australian Bureau of Statistics for coding of the cause of death and compilation into aggregate statistics. The cause of death is coded using the ICD. Multiple causes of death, including the underlying and all associated causes of death recorded on the death certificate, are available from 1997 onwards.

Potential years of life lost

The potential years of life lost (PYLL) from a disease or injury is an indicator of premature or untimely death. If dying before the age of 75 years is considered premature, then a person dying at the age of 50 years would have lost 25 potential years of life.

In contrast to the basic mortality measures where all deaths are counted equally, PYLL highlights deaths that occur at younger ages. These deaths strongly affect families and society because they occur prematurely and often have economic consequences. Furthermore, many of these premature deaths may be avoidable.

Among the specific causes of death, coronary heart disease is the greatest contributor to premature mortality among males, but breast cancer is the leading cause of PYLL among females (Table 2.15). Suicide, land transport accidents and lung cancer also feature highly for both sexes.

Males lose 75% more potential years of life than females. Two of the largest contributors to this gap are coronary heart disease and suicide.

Table 2.15: Leading specific causes of potential years of life lost (PYLL), 2005

	Males			Females		
Rank	Cause of death (code)	PYLL	Per cent all causes PYLL	Cause of death (code)	PYLL	Per cent all causes PYLL
1	Coronary heart disease (I20–I25)	59,795	11.1	Breast cancer (C50)	30,248	9.9
2	Suicide (X60–X84)	52,998	9.8	Lung cancer (C33–C34)	16,628	5.4
3	Land transport accidents (V00–V89)	42,505	7.9	Coronary heart disease (I20–I25)	15,515	5.1
4	Lung cancer (C33–C34)	26,888	5.0	Suicide (X60–X84)	13,270	4.3
5	Other heart diseases (I05–I09, I11, I13, I26, I27, I30–I52)	18,215	3.4	Land transport accidents (V00–V89)	12,678	4.1
	All causes	**538,985**		**All causes**	**306,330**	

Notes

1. Codes refer to the International Classification of Diseases, 10th revision (ICD-10).
2. PYLL is the sum of years between the age of death and 75, for all deaths for selected causes.

Source: AIHW National GRIM Books.

Avoidable deaths

'Avoidable deaths' are those that result from conditions where death is considered to be substantially avoidable today, given existing health and social systems (Page et al. 2006). Deaths relating to these conditions could be avoided either through prevention (a reduction in the incidence of the conditions), treatment (that increases survival) or a combination of these.

Building on previous Australian, New Zealand and international research, the University of Adelaide's Public Health Information and Development Unit and the New Zealand Ministry of Health have defined a list of specific conditions from which death is considered to be potentially avoidable through prevention or treatment (Page et al. 2006). For example, deaths due to HIV/AIDS, injuries and lung cancer could be avoided through prevention, whereas deaths due to asthma, appendicitis and a range of other types of cancer could be avoided through treatment. Deaths due to coronary heart disease, stroke and diabetes are considered to be avoidable through a combination of prevention and treatment. Some examples of conditions where death is not considered to be avoidable—either because the conditions are not currently preventable, or because current treatments cannot significantly reduce the risk of death—are multiple sclerosis and motor neurone disease.

Only deaths of individuals aged under 75 years are considered to be potentially avoidable. At older ages, many people have several different health problems, and assigning a single underlying cause of death is difficult. This makes classifying deaths as 'avoidable' or 'unavoidable' less valid in those aged 75 and over.

Over the period 1999–2001 there were more than 265,000 deaths in Australia among people aged under 75 years. Almost three-quarters (190,000) of these deaths were considered to be avoidable. As with overall mortality, the avoidable death rate among males was higher than among females: 232 per 100,000 in males compared with 121 in females (*NHPC indicator 1.06*) (Table 2.16). Avoidable death rates increased with age for both sexes, from 10 deaths per 100,000 in people aged 1–14 years to 1,339 among those aged 65–74 years.

Table 2.16: Avoidable deaths by age and sex, people aged under 75 years, 1997–2001

Age	Number			Per cent of total	Rate per 100,000 population[a]			Rate ratio[b] male:female
	Males	Females	Total		Males	Females	Total	
<1	2,151	1,640	3,791	2.0	349.7	281.1	315.4	124
1–14	1,132	746	1,878	1.0	12.0	8.3	10.2	145
15–24	5,289	1,756	7,045	3.7	77.2	26.8	52.0	288
25–44	16,967	7,389	24,356	12.8	116.4	49.7	83.1	234
45–64	41,251	23,031	64,282	33.9	395.4	223.8	309.6	177
65–74	56,236	32,257	88,493	46.6	1,760.4	917.3	1,338.8	192
Total[c]	**123,026**	**66,819**	**189,845**	**100.0**	**232.1**	**121.1**	**176.6**	**192**

(a) Rates are age-standardised within age categories, except under 1 year.

(b) Male rate divided by female rate, multiplied by 100.

(c) *NHPC indicator 1.06*: Number of potentially avoidable deaths.

Source: Page et al. 2006.

Reductions in avoidable deaths have contributed greatly to the fall in overall mortality rates in Australia. Between 1987 and 2001, avoidable mortality rates among people aged under 75 years declined by almost 40%, whereas mortality rates from unavoidable causes in this age group fell by 14% (Page et al. 2006). The reduction was seen in both sexes and across all age groups under 75.

2.6 Burden of disease

Although the information in this chapter about causes of death, disease prevalence, causes of disability and poor health is valuable, its varied nature means that it is difficult to get a clear and simple picture of the extent of the burden of disease and injury in Australia. Allocating health resources in the most effective way requires information about which conditions have the biggest impact on Australians and where the most gains in health can be made. This is a challenge. For example, how can the impact of a common chronic disease that leads to long-term disability, but rarely causes death, be compared with the impact of a disease that is less common but often fatal?

To meet this challenge, a summary unit of measure called the DALY (pronounced 'dally', a disability-adjusted life year) has been developed to compare the impact of different diseases and injuries on an equal basis. It can also be used to compare the burden between different population groups and for different countries (allowing for different population sizes), and it can be applied to the impact of risk factors as well.

One DALY is one year of 'healthy life' lost due to a disease or injury. The more DALYs, the greater the burden, whether applied to an individual or a population. That lost healthy life can be from premature death, prolonged illness or disability, or a combination. To illustrate the basic concepts, a person who has been healthy all his life but who suddenly dies of a heart attack 20 years early has lost 20 years of healthy life—20 DALYs. For a person who lives to a normal old age but has been only 'half-well' for 30 years, there are 15 DALYs. (In practice the DALY method is a little more complex and these numbers are modified slightly; see Box 2.7). Using information about the impacts of different diseases and injuries on individuals, and the number of cases arising in the community, DALYs can be added up for each problem and also combined to give a grand total. Box 2.7 explains this in more detail.

The main advantage of DALYs is that they give better and due prominence to health problems that cause much illness and disability even if they are not often fatal; and also to conditions that may not cause many deaths but, when they do, those deaths occur among younger people.

Box 2.7: Calculating disability-adjusted life years

According to *The burden of disease and injury in Australia 2003* (Begg et al. 2007), Australia racked up 2.6 million years of lost 'healthy life' due to disease and injury in 2003. How is this estimated?

Let's build this estimate by starting with just one case, Jim. His is a typical case of a person with a serious disease, Q. He is fully healthy until he gets the disease in 2003, aged 50. Evidence about the disease shows he is likely to live with it until he dies aged 60. Based on further evidence, those 10 years suffering his particular disease will be equal to only 3 years of full health. This means he will 'lose' 7 healthy years even though he is alive. (In technical terms, his disease has a 'severity weight'—often known as a 'disability weight'—of 0.7. As other examples, if the severity weight had been 0.55 he would have 'lost' 5.5 of those 10 years; and 1.8 years if it had been 0.18.)

But Jim's 7 lost years are then adjusted using a standard method from economics. Because future gains or losses mean less to us than present ones, each successive year lost is 'discounted' by a small amount (3%). This brings the estimated years lost through disability or illness (known as YLDs) down from 7 to 6.3.

As well as the 6.3 healthy years lost through disability, Jim will lose many years through dying too early. At the age he dies, 60, a male in 2003 would normally go on to live until he is 81. As was done for the years lost through illness or disability, these further 21 lost years (or YLLs) are discounted by 3% per year. This brings them down to 15.6.

Jim's total disability-adjusted life years (DALYs) are therefore 6.3 plus 15.6, making 21.9.

Using this reasoning, we can take all the people getting Jim's disease and start to build towards that grand total of 2.6 million DALYs. This means drawing on surveys and other research that shows:

- how many males and females are newly diagnosed with Q in the year in question (2003)
- what sex and age groups they are in
- how long people of each group will typically have their disease for
- the average age at which the people in each group are likely to die.

Next we can calculate subtotals for each group and then total them to get Q's DALYs for the Australian population.

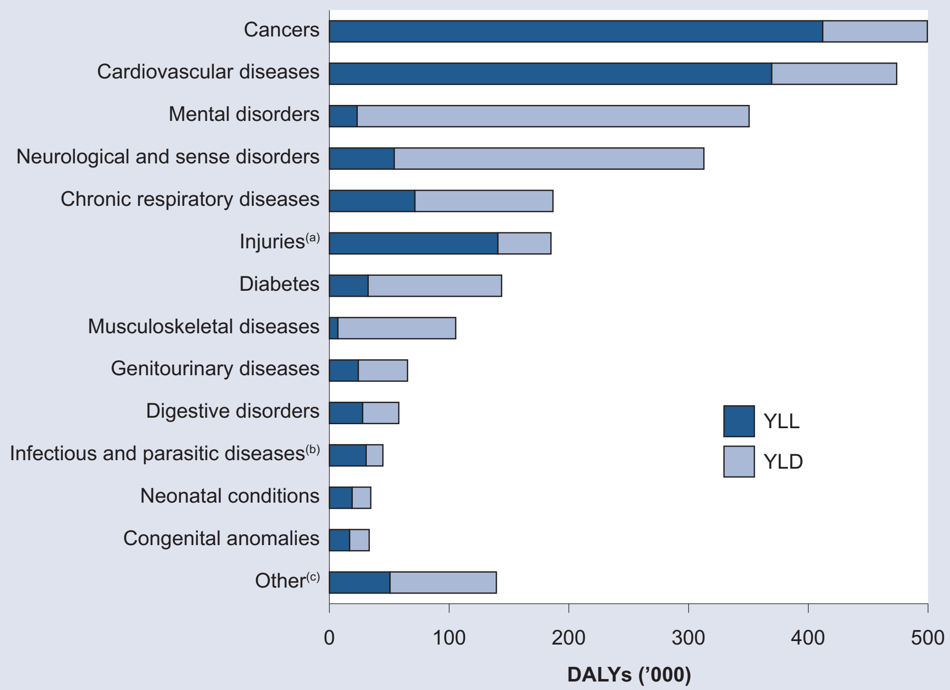
Finally, the steps taken for Q can be applied to all other forms of disease and injury that arose in the year of interest. Considering this process, it is not hard to see how the resulting grand total of DALYs can amount to millions in a population of around 20 million people in 2003. Over 190 conditions were examined in *The burden of disease and injury in Australia 2003* (Begg et al. 2007); many of these problems can occur in many Australians each year.

The first comprehensive study of the burden of disease in Australia, using the DALY method, was carried out by the AIHW against a set of 176 disease and injury categories (AIHW: Mathers et al. 1999). The reference year for that study was 1996. The estimates have now been updated to the year 2003 by the University of Queensland, in association with the AIHW (Begg et al. 2007). This section provides an overview of the burden of disease in Australia, and its major components. More detailed information on the burden posed by particular diseases is given in Chapter 5.

Total burden of disease and injury—DALYs

The total burden of disease and injury in Australia in 2003 was estimated to be more than 2.6 million DALYs. Males accounted for more of this burden than females (1.4 million compared with 1.3 million). Years lost due to disability (YLD—see Box 2.7) contributed slightly more to the total than did years of life lost due to death (YLL), with YLD responsible for 48% of the DALYs for males and 56% for females.

Cancers were the leading contributor (19% of total DALYs), followed by cardiovascular disease (CVD, 17%), mental disorders (13%), neurological and sense disorders (12%) and chronic respiratory diseases (7%). For cancer and CVD the majority of DALYs were due to deaths (YLL), whereas disability (YLD) was more important for mental disorders and neurological and sense disorders (Figure 2.17).



(a) Includes intentional and unintentional injuries.

(b) Excludes acute respiratory infections.

(c) Includes maternal conditions, nutritional deficiencies, non-malignant neoplasms, skin diseases, oral health conditions, acute respiratory infections and ill-defined conditions.

Source: Begg et al. 2007.

Figure 2.17: Burden (YLL, YLD and total DALYs) of major disease groups, 2003

Note that these DALY estimates represent the overall burden of disease remaining after preventive and treatment interventions have had their effect. Consequently, some important disease groups are low in the DALY rankings because preventive and treatment interventions for these diseases have been very successful. This applies in particular to infectious and parasitic diseases, which contributed only 1.7% of DALYs in 2003, and oral health conditions, which were responsible for only 0.9%.

Fatal burden of disease—years of life lost

Deaths were responsible for 1.28 million YLL in Australia in 2003—almost half the DALYs (Table 2.17). Australian males lost 25% more years of life than females.

Major causes of YLL

Cancers (32%), CVD (29%) and injuries (11%) were responsible for about three-quarters of the total YLL in both sexes in 2003. Their contribution varied by age group, however, corresponding to the most common causes of death at different stages of life (see Section 2.5). In persons aged 75 years and over, CVD accounted for close to half of the YLL, whereas cancers were a more important contributor than CVD to YLL for those aged less than 75 years. Injuries were the major reason for YLL in young adults and in children aged 5–14 years. Neonatal conditions were the main cause of YLL in children aged under 5 years.

Table 2.17: Fatal and non-fatal burden of major disease groups, 2003

	Fatal component		Non-fatal component		Total	
Disease group	**YLL ('000)**	**Per cent of total YLL**	**YLD ('000)**	**Per cent of total YLD**	**DALYs ('000)**	**Per cent of total DALYs**
Cancer	412.0	32.2	87.5	6.5	499.4	19.0
Cardiovascular diseases	369.4	28.9	104.4	7.7	473.8	18.0
Mental disorders	23.2	1.8	327.4	24.2	350.5	13.3
Anxiety & depression	*0.3*	—	*191.5*	*14.0*	*191.8*	*7.3*
Neurological and sense disorders	54.1	4.2	258.6	19.1	312.8	11.9
Dementia	*24.1*	*1.9*	*70.3*	*5.2*	*94.4*	*3.6*
Chronic respiratory diseases	71.3	5.6	115.4	8.5	186.7	7.1
Injuries(a)	140.6	11.0	44.4	3.3	185.1	7.0
Diabetes	32.3	2.5	111.5	8.2	143.8	5.5
Type 2 diabetes	*27.0*	*2.1*	*105.9*	*7.8*	*132.9*	*5.0*
Musculoskeletal diseases	7.0	0.5	98.5	7.3	105.5	4.0
Genitourinary diseases	24.1	1.9	41.2	3.0	65.2	2.5
Digestive disorders	27.7	2.2	30.2	2.2	58.0	2.2
Infectious & parasitic diseases	30.7	2.4	14.0	1.0	44.7	1.7
Acute respiratory infections	23.8	1.9	11.8	0.9	35.5	1.3
Congenital anomalies	19.0	1.5	15.6	1.2	34.6	1.3
Neonatal conditions	16.9	1.3	16.3	1.2	33.2	1.3
Other(b)	26.8	2.1	77.2	5.7	103.9	3.9
Total	**1,278.8**	**100.0**	**1,354.0**	**100.0**	**2,632.8**	**100.0**

(a) Includes intentional and unintentional injuries.

(b) Includes maternal conditions, nutritional deficiencies, non-malignant neoplasms, skin diseases, oral health conditions and ill-defined conditions.

Source: Begg et al. 2007.

Non-fatal burden of disease—years lost due to disability

The non-fatal component of the disease burden, assessed using the measure YLD, presents a substantially different picture from that provided by YLL. Over half of the burden of disease is due to non-fatal consequences of disease—a loss of more than 1.4 million years of 'healthy' life due to disability caused by disease that emerged in 2003.

Major contributors to YLD

Mental disorders were the leading contributors to YLD, accounting for 24% of the non-fatal burden of disease in Australia in 2003. Neurological and sense disorders were responsible for another 19% of YLD. This latter category was dominated by dementia and hearing loss.

In contrast to YLL, the estimated total YLD was almost identical for males and females. The non-fatal burden for neurological diseases and sense disorders, mental disorders and musculoskeletal disorders were all higher for females than for males. On the other hand, YLD for CVD, diabetes, chronic respiratory diseases and cancers were higher among males.

Leading specific causes of burden of disease

The DALY data described above were at the broadest level of disease groupings. The data presented in Table 2.18 show disease burden at a more specific disease level. Coronary heart disease, anxiety and depression, and Type 2 diabetes were the largest specific contributors to the overall burden. The 20 leading specific contributors (out of a total of 193 diseases and injuries) accounted for about 60% of the 2003 DALYs. In this list are several largely non-fatal conditions, including anxiety and depression, asthma, back pain (chronic and acute), osteoarthritis, personality disorders and hearing loss.

Two of the top seven causes of disease burden, lung cancer and chronic obstructive pulmonary disease (COPD), are mostly attributable to tobacco smoking; in addition, a large proportion of DALYs for ischaemic heart disease and stroke are on account of tobacco smoking. Exposure to modifiable risk factors was estimated to account for 847,000 DALYs (32% of the total); tobacco smoking was the largest contributor at almost 205,000 DALYs.

In using the DALY method to estimate the overall burden of disease and injury, each year of 'healthy life' lost can only be assigned to a single cause. However, some health problems occur as complications or after-effects of others. In such cases, a choice must be made as to which disease or injury the relevant DALYs will be assigned, in order to avoid 'double-counting' the problem's impact.

For example, the burden attributable to Type 2 diabetes (5.0% of the total) represents the burden due to Type 2 diabetes itself and its specific effects (such as neuropathy, diabetic foot and retinopathy). However, a substantial proportion of coronary heart disease and stroke in the community is attributable to Type 2 diabetes, and if this is added the Type 2 diabetes burden increases to 7.6% of the total. To avoid double-counting, the coronary heart disease burden will then correspondingly decline from 10.0% to 8.1% and the stroke burden from 4.5% to 3.8%.

Table 2.18: The 20 leading specific causes of burden of disease and injury in Australia, 2003

Rank	Condition	DALYs	Per cent of total DALYs
1	Coronary heart disease	263,497	10.0
2	Anxiety and depression	191,786	7.3
3	Type 2 diabetes	132,940	5.0
4	Stroke	118,462	4.5
5	Dementia	94,400	3.6
6	Lung cancer	88,904	3.4
7	Chronic obstructive pulmonary disease (COPD)	86,751	3.3
8	Adult-onset hearing loss	64,853	2.5
9	Colorectal cancer	63,605	2.4
10	Asthma	63,100	2.4
11	Breast cancer	60,654	2.3
12	Suicide and self-inflicted injuries	49,916	1.9
13	Road traffic accidents	42,425	1.6
14	Prostate cancer	36,547	1.4
15	Osteoarthritis	34,578	1.3
16	Alcohol dependence & harmful use	34,116	1.3
17	Personality disorders	32,587	1.2
18	Back pain	29,658	1.1
19	Schizophrenia	27,502	1.0
20	Lower respiratory tract infections	27,354	1.0
	All other causes	*1,089,135*	*41.4*
	All causes	**2,632,770**	**100.0**

Source: Begg et al. 2007.

Is the burden of disease changing over time?

Because of changes in the methods used to calculate DALYs, the numbers presented here should not be compared directly with the numbers published from the 1996 Australian burden of disease study (AIHW: Mathers et al. 1999). However, some comparisons can be made based on statistical modelling of trends in incidence and death rates for various conditions (Begg et al. 2007). These models allow estimates of both past and future burden of disease to be made. In order to compare the DALY estimates for different years, the estimates are age-standardised (see Box 2.1) and expressed as a rate of DALYs per 100,000 persons.

Changes from 1993 to 2003

Between 1993 and 2003 the burden of disease in Australia substantially lessened, with a 15% decline in age-standardised DALY rates. Most of this decline was in the fatal component of burden of disease (YLL), particularly for cardiovascular disease, cancer and injury. The non-fatal component (YLD) fell less, and for some diseases (such as diabetes) the non-fatal burden increased (Begg et al. 2007).

Projections beyond 2003

If the rate of decline over the decade to 2003 continues for the next 2 decades, then we can expect age-standardised DALY rates to decline by 30%. However, projections indicate that we can expect only a 16% decline. This slowing in the rate of decline is because progress in further reducing the impact of problems such as cardiovascular disease, where much of the disease is preventable or treatable, is likely to be less rapid than it was in the past. Problems such as neurological and musculoskeletal disorders, where our rate of progress is slower, and diabetes, where the situation is worsening, will continue to contribute greatly to the overall burden. Research breakthroughs in areas such as dementia and arthritis, or improved prevention and treatment of diabetes, could change this picture.

References

ABS (Australian Bureau of Statistics) 2004. Disability, ageing and carers: summary of findings, Australia 2003. ABS cat. no. 4430.0. Canberra: ABS.

ABS 2006a. 2004–05 National health survey: summary of results, Australia. ABS cat. no. 4364.0. Canberra: ABS.

ABS 2006b. Deaths, Australia, 2005. ABS cat. no. 3302.0. Canberra: ABS.

ABS 2006c. National Aboriginal and Torres Strait Islander health survey, 2004–05, Australia. ABS cat. no. 4715.0. Canberra: ABS.

ABS 2007a. 2006 General social survey: summary results, Australia. ABS cat. no. 4159.0. Canberra: ABS.

ABS 2007b. Australian demographic statistics, March quarter, 2007. ABS cat. no. 3101.0. Canberra: ABS.

ABS 2007c. Births, Australia, 2006. ABS cat. no. 3301.0. Canberra: ABS.

ABS 2007d. Population by age and sex, Australian states and territories, June 2006. ABS cat. no. 3201.0. Canberra: ABS.

AIHW (Australian Institute of Health and Welfare) 2006. Mortality over the 20th century in Australia: trends and patterns in major causes of death. Mortality surveillance series no. 4. Cat. no. PHE 73. Canberra: AIHW.

AIHW: Mathers C, Vos T & Stevenson C 1999. The burden of disease and injury in Australia. Cat. No. PHE 17. Canberra: AIHW.

Ausubel JH, Meyer PS & Wernick IK 2001. Death and the human environment: the United States in the 20th century. Technology in Society 23(2): 131–46.

Begg S, Vos T, Barker B, Stevenson C, Stanley L & Lopez AD 2007. The burden of disease and injury in Australia 2003. Cat. no. PHE 82. Canberra: AIHW.

Boult C, Dowd B, McCaffrey D, Boult L, Hernandez R & Krulewitch H 1993. Screening elders for risk of hospital admission. Journal of the American Geriatric Society 41(8): 811–7.

Capewell S, Beaglehole R, Seddon M & McMurray J 2000. Explanation for the decline in coronary heart disease mortality rates in Auckland, New Zealand, between 1982 and 1993. Circulation 102: 1511–16.

DIMA (Department of Immigration and Multicultural Affairs) 2001. Immigration: Federation to century's end. Canberra: DIMA.

Ford J, Spallek M & Dobson A 2007. Self-rated health and a healthy lifestyle are the most important predictors of survival in elderly women. Age and Ageing Advance Access published 6 December, doi: 10.1093/ageing/afm171.

Hugo G, Rudd D & Harris K 2001. Emigration from Australia: economic implications. CEDA information paper no. 77. Melbourne: Committee for Economic Development of Australia (CEDA).

Jemal A, Ward E, Hao Y & Thun M 2005. Trends in the leading causes of death in the United States. Journal of the American Medical Association 294:1255–9.

Laws PJ, Abeywardana S, Walker J & Sullivan EA 2007. Australia's mothers and babies 2005. Perinatal statistics series no. 20. Cat. no. PER 40. Sydney: AIHW National Perinatal Statistics Unit.

NHMRC (National Health and Medical Research Council) 2001. Australian alcohol guidelines: health risks and benefits. Canberra: NHMRC.

OECD (Organisation for Economic Co-operation and Development) 2007. OECD health data 2007. Version: July 2007. Paris: OECD. Viewed 5 October 2007, <www.ecosante.org/oecd>.

Page A, Tobias M, Glover J, Wright C, Hetzel D & Fisher E 2006. Australian and New Zealand atlas of avoidable mortality. Adelaide: Public Health Information Development Unit, University of Adelaide.

WHO (World Health Organization) 1992. International statistical classification of diseases and related health problems, 10th revision. Geneva: WHO.

WHO 2001. International classification of functioning, disability and health (ICF). Geneva: WHO.

WHO 2007. WHO statistical information system. Life tables for WHO member states. Geneva: WHO. Viewed 15 August 2007, <www.who.int/whosis/en>.

Winstanley M, Woodward S & Walker N 1995. Tobacco in Australia: facts and issues, 2nd edition. Melbourne: Victorian Smoking and Health Program.

Whose health? How population groups vary

3

Key points

- Compared with those who have social and economic advantages, disadvantaged Australians are more likely to have shorter lives, higher levels of disease risk factors and lower use of preventive health services.
- Indigenous people are generally less healthy than other Australians, die at much younger ages, have more disability and a lower quality of life.
- Despite improvements in Indigenous death rates, the overall gap between Indigenous and non-Indigenous rates appears to be widening.
- However, the gap in death rates between Indigenous infants and other Australian infants is narrowing.
- People living in rural and remote areas tend to have shorter lives and higher levels of illness and disease risk factors than those in major cities.
- Prison inmates tend to have poor mental health and high levels of health risk behaviours, such as drug and alcohol use, smoking, and unsafe sexual practices.
- Most migrants enjoy health that is as good as or better than that of the Australian-born population—often with lower rates of death, hospitalisation, disability and disease risk factors.
- Death rates for Australian Defence Force members are lower than the general community's for overall mortality, cancer, cardiovascular disease, assault and suicide.
- Veterans tend to have poorer mental health than the general community, with the prevalence of mental health problems being closely related to the degree of combat exposure.

Australians are generally healthy and continue to become healthier. But is this the same for all Australians? There will always be individuals who are unlucky in their health, but do our various population groups tend to have a fair share of Australia's health?

If some do not, it is important to study their patterns of health for at least two reasons. First, there is the basic social issue of fairness in a major aspect of people's lives, their health. Second, the patterns may help suggest why population groups have certain problems, why they need extra attention and in what ways. This may offer opportunities for the health system in particular but also for wider social improvements.

There is scope to identify many population groups in Australia but this chapter focuses on six groups. The first four—socioeconomically disadvantaged people, Indigenous Australians, those living in rural and remote areas, and prisoners—show various levels and types of health disadvantage. The remaining two groups—those born overseas and members of the defence forces—do not tend to have poorer health but they still have some special concerns.

For another perspective on groups, Chapter 6 covers health statistics across the life stages, ranging from the health of mothers, babies and infants, through childhood and youth to the years of adulthood, including old age.

3.1 Socioeconomically disadvantaged people

Although the overall level of health and wellbeing of the Australian population is high when compared with the populations of many overseas countries, there are substantial differences in the health of specific groups within our population. One of the most important contributors to these differences is socioeconomic status.

As discussed in Chapter 4, socioeconomic characteristics are key determinants of health and wellbeing, and contribute to differences in health or 'health inequality' across the population. There are many factors that can contribute to inequality—age, sex, ethnicity, gender, social and economic status, disability, geographical area, and so on. Although some dimensions of inequality are unavoidable (such as age), many other inequalities occur as a result of socioeconomic differences in material resources, access to educational opportunities, safe working conditions, effective services, living conditions in childhood, racism and discrimination. Most of these are amenable to intervention, so they should be avoidable (Hetzel et al. 2004).

Because economic and social inequalities go hand in hand, their combined impact results in limited opportunities and life chances for many who are affected by them. Those with the highest socioeconomic status are those who have the most resources, opportunities and power to make choices, whereas those with the lowest status have the least of these. This forms a 'social gradient', with overall health and wellbeing tending to improve at each step up the socioeconomic ladder. Thus, people with a higher income generally enjoy better health and longer lives than people with a lower income (Marmot et al. 1984). The rich tend to be healthier than those in the middle, who are, in turn, healthier than the poor.

The gradient is evident whether looking at differences in current socioeconomic status or that of family of origin. The effects seem to persist throughout life, from birth through adulthood and into old age, and possibly to the next generation (Hertzman 1999). The effect tends to entrench differences in health and wellbeing across the population. However, although it is clear that poor living and working conditions impair health and shorten lives, the pathways through which these factors act and are related are complex and not yet fully understood.

Measuring socioeconomic status

The concept 'socioeconomic status' represents how individuals and groups are 'placed' in a society, and the cumulative effects of time. It also reflects the context in which health-damaging exposures and health-protective resources act at different stages of life to influence health; and it represents how recent and remote socioeconomic factors interact to affect health (Brown et al. 2004).

A number of important dimensions of socioeconomic status are identified in the literature, including social prestige, material resources, and occupation and working conditions (Galobardes et al. 2007). However, the various socioeconomic measures—such as education, occupation, income, wealth and housing tenure—are not interchangeable and may produce different estimates of the impact of socioeconomic status on health (Krieger et al. 2005). As well as the socioeconomic factors affecting health in their own right, they interact in their effects (Krieger et al. 2005).

Socioeconomic status can be measured at three levels: individual, household, and neighbourhood or other small area. In Australia, area-level indicators are often used as measures of socioeconomic status. These are aggregated from individual level or small area data, usually from census or other administrative databases. They can be used to describe areas on a continuum from disadvantaged to affluent or as a proxy for the socioeconomic status of the people living in those areas. *Australia's health 2008* examines socioeconomic status using the Index of Relative Socio-Economic Disadvantage (IRSD), one of four Socio-Economic Indexes for Areas (SEIFAs) developed by the Australian Bureau of Statistics (Box 3.1).

Box 3.1: Socioeconomic status and the Index of Relative Socio-Economic Disadvantage

The Index of Relative Socio-Economic Disadvantage (IRSD) is one of four Socio-Economic Indexes for Areas (SEIFAs) compiled by the Australian Bureau of Statistics (ABS) after each Census of Population and Housing. The SEIFAs aim at representing the socioeconomic status (SES) of Australian communities and identifying areas of advantage and disadvantage. The IRSD scores each area by summarising attributes of the population such as low income, low educational attainment, high unemployment, and jobs in relatively unskilled occupations.

Typically, the IRSD areas used are the 37,000 ABS Collection Districts. They are ranked by their IRSD score, and then divided into groups that represent equal proportions of the total Australian population. Usually the grouping is in fifths but there can be others such as fourths or tenths. The groups can then be compared for different matters of interest—for example, according to their rates of smoking, obesity, deaths and so on.

In this report, an area group comprising the fifth of the population with the greatest overall level of disadvantage is described as the 'lowest SES fifth'. The fifth at the other end of the scale—the top fifth—is described as the 'highest SES fifth'.

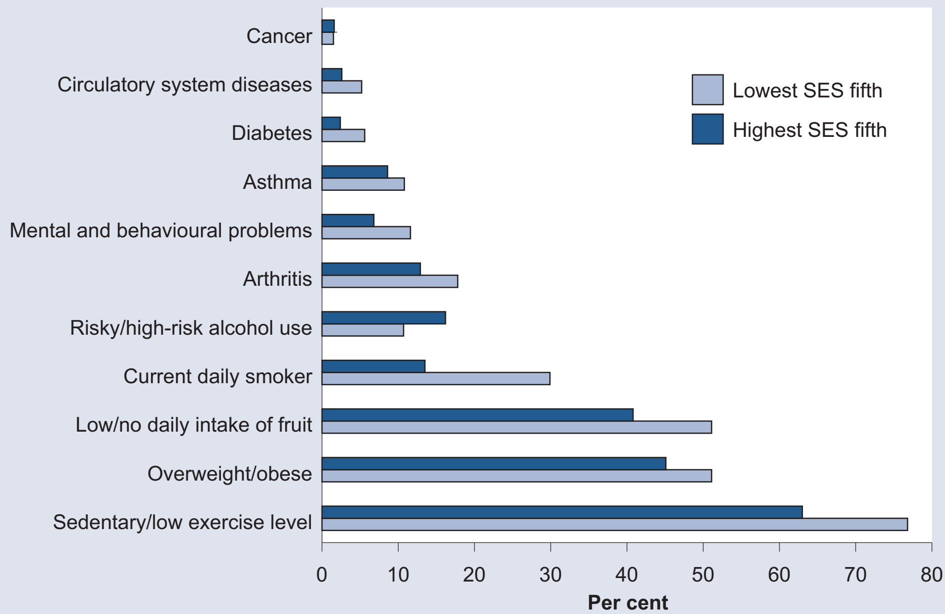
It is important to note that the IRSD reflects the overall or average level of disadvantage of the population of an area: it does not show how individuals living in the same area differ from each other in their SES (Krieger et al. 1997). Being an average, the score is also likely to reduce the apparent differences between area groups (Glover et al. 2004a).

Socioeconomic status and health

Many studies show that people or groups who are socially and economically disadvantaged have reduced life expectancy, premature mortality, increased disease incidence and prevalence, increased biological and behavioural risk factors for ill health, and lower overall health status (Glover et al. 2004b; AIHW: Mathers 1996).

For example, social gradients are evident for many of the major chronic diseases and their risk factors in Australia (Glover et al. 2004b). Results from the 2004–05 National Health Survey (NHS) indicate that people with lower socioeconomic status are more likely to smoke, exercise less, be overweight and/or obese, and have fewer or no daily serves of fruit (ABS 2006a). These are risk factors for a number of long-term health conditions such as respiratory diseases, lung cancer and cardiovascular diseases (Figure 3.1).

Among the long-term health conditions covered in the 2004–05 NHS, those reported most often by disadvantaged people were diabetes, diseases of the circulatory system (which include heart disease and stroke), arthritis, mental health problems and respiratory diseases (including asthma). The survey also found that those who were socioeconomically disadvantaged reported more visits to doctors and hospital outpatient and accident and emergency services, but were less likely to use preventive health services, such as dental services (ABS 2006a).



Note: See Box 3.1 for explanation of socioeconomic status (SES).

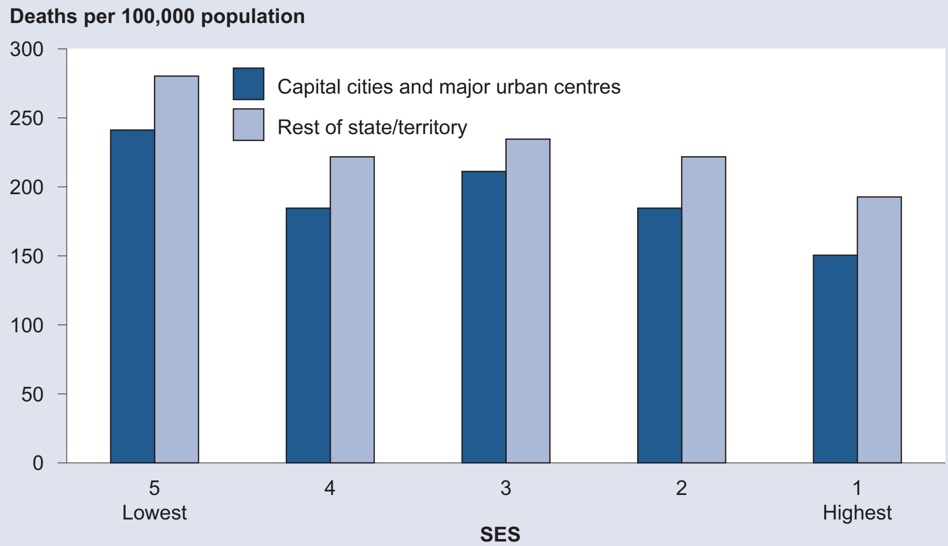
Source: ABS 2006a.

Figure 3.1: Proportion of people aged 18 years and over reporting selected health risk factors and long-term conditions, by socioeconomic status, 2004–05 (per cent)

Studies of deaths have shown that Australia has substantial socioeconomic inequalities, with premature death rates generally being highest among those who are the most disadvantaged. Draper et al. (2004) found that, with some exceptions, death rates were highest in the most disadvantaged areas of Australia for males and females across all age groups. Moreover, death rates often increased with rising disadvantage.

'Avoidable mortality' means those causes of death that are potentially avoidable at the present time, given our available knowledge about the effects of social and economic policy, health behaviours and health-care interventions (Page et al. 2006). Figure 3.2 shows avoidable mortality by areas that have been ranked into five groups according to their level of disadvantage. Areas have also been grouped so that socioeconomic status is presented separately for capital cities and major urban centres combined and the rest of the state/territory areas combined.

Figure 3.2 shows that the areas of highest socioeconomic status have the lowest rates of avoidable mortality and areas of lowest socioeconomic status have the highest rates. For example, in both the capital cities and rest of state/territory areas, there is an almost continuous socioeconomic gradient in the rates of avoidable death. In the capital cities and major urban centres, the overall avoidable mortality rate for the 'worst-off' fifth was 60% higher than for the 'best-off' fifth. For those in the rest of the state or territory areas, the corresponding figure was a 45% higher rate.



Notes

1. See Box 3.1 for explanation of socioeconomic status (SES).
2. Deaths are presented as the age-standardised rate per 100,000 population.
3. Major urban centres are Newcastle, Wollongong, Geelong, Gold Coast and Townsville–Thuringowa.
4. Rest of state/territory comprises areas outside the capital cities and other major urban centres.

Source: Page et al. 2006.

Figure 3.2: Avoidable mortality (under 75 years) by socioeconomic status and area, all causes, 1997–2001

For further information about socioeconomic characteristics and health, see Section 4.3.

3.2 Aboriginal and Torres Strait Islander peoples

Aboriginal and Torres Strait Islander peoples (Indigenous Australians) experience significantly more ill health than other Australians. They typically die at much younger ages and are more likely to experience disability and reduced quality of life because of ill health (AIHW 2007a). The burden of disease and injury among Indigenous Australians in 2003 was estimated to be 95,976 DALYs (disability-adjusted life years or years of life lost through premature death or living with disability; see Box 2.7). This represented 3.6% of the total burden of disease in Australia for a group that makes up 2.5% of the total population. The leading causes of this burden were cardiovascular diseases, mental disorders, chronic respiratory disease, diabetes and cancer (Vos et al. 2007).

Although there have been improvements in the mortality rates of Indigenous Australians in recent years, available data suggest that the relative gap in overall mortality rates between Indigenous and non-Indigenous Australians is widening. However, the gap in mortality rates between Indigenous infants and other infants is narrowing.

Data from a number of sources indicate that across a range of socioeconomic and health-related indicators the Indigenous population is disadvantaged. In 2004–05, Aboriginal and Torres Strait Islander peoples reported lower incomes than other Australians, higher rates of unemployment, lower educational attainment and lower rates of home ownership (AIHW 2007a).

The socioeconomic disadvantage experienced by Aboriginal and Torres Strait Islander peoples compared with other Australians places them at greater risk of exposure and vulnerability to health risk factors such as smoking and alcohol misuse, and other risk factors such as exposure to violence. However, socioeconomic disadvantage alone does not explain all the differences in health status that exist between Indigenous and non-Indigenous Australians (Glover et al. 2004c; Carson 2007). Numerous other aspects of the living, working and social conditions of Indigenous Australians, along with a reduced sense of control over their own lives, may help to explain the generally poorer health of Aboriginal and Torres Strait Islander peoples.

This section discusses data sources used to compile the health information on Aboriginal and Torres Strait Islander peoples and outlines some problems with data quality. It then describes the demographic profile of Indigenous Australians and some measures of health status, disability rates and service use. The section concludes with information on behaviours that affect health status such as smoking, excessive alcohol consumption and the use of illicit drugs; and finally discusses the housing conditions of Indigenous people.

Data quality

There has been much progress in collecting information on the health of Aboriginal and Torres Strait Islander peoples over the last decade, but many logistical, analytical and conceptual challenges remain (AIHW & ABS 2006). This is partly due to varying levels of identification of Indigenous people in administrative records and partly to the statistical and practical challenges of surveying a population that is relatively small—2.5% of the total population—and one-quarter of whom (24%) live in Remote or Very Remote areas (ABS 2007a). Improving both the enumeration of Indigenous Australians in the Census and the identification of Indigenous people in administrative data sets are key strategies towards better quality information about the health of the Indigenous population.

A number of administrative data sets and household surveys are used to provide useful information on specific diseases, risk factors, living conditions and access to and use of services. These include birth and death registration, disease registers, and data on consultations with general practitioners, community-controlled and other Aboriginal health services, and hospital use. Surveys include national household surveys and surveys aimed specifically at Aboriginal and Torres Strait Islander peoples.

The coverage of Indigenous Australians in birth registration is improving, but Indigenous death registrations are not yet complete enough in all states and territories to provide national estimates. Data from Queensland, Western Australia, South Australia and the Northern Territory are used to provide indicative information on deaths.

Until recently, only data from Queensland, Western Australia, South Australia and the Northern Territory were used to provide information on hospital use by Indigenous Australians. The extent of under counting of Indigenous people in hospital records has been assessed recently by the AIHW. The results show that there have been significant improvements in the quality of Indigenous identification in both New South Wales and Victoria. Therefore data from New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory can now be used for reporting on hospital use by Indigenous Australians. These six jurisdictions represent 96% of the Indigenous population of Australia.

Australia's Indigenous population

The preliminary Indigenous estimated resident population of Australia was 517,200 at 30 June 2006, constituting 2.5% of the total Australian population. Between 2001 and 2006, the estimated Australian Indigenous resident population increased by 13%.

In 2006, around 90% of Indigenous people identified as being of Aboriginal origin only, 6% as being of Torres Strait Islander origin only, and 4% as being of both Aboriginal and Torres Strait Islander origin (ABS 2007a). Although there is a common perception that most Indigenous Australians live in remote areas, the majority (76%) live in Major Cities and regional areas (ABS 2007a).

The Indigenous population is considerably younger than the non-Indigenous population. In 2006, the median age was 20 years for Indigenous people and 37 years for the non-Indigenous population (ABS 2007b). This is largely due to higher fertility rates and to deaths occurring at younger ages in the Indigenous population. For this reason, many of the rates presented in this section are age-standardised to allow for meaningful comparisons with the non-Indigenous population (see Box 2.1 for a discussion of age-standardisation methods, using death rates as an example).

Health status

Life expectancy

The estimated life expectancy at birth for Aboriginal and Torres Strait Islander peoples, using the method endorsed by the ABS and the AIHW (Bhat 2002), is much lower than for other Australians (See Box 3.2 for more information about estimating life expectancy). For the period 1996–2001, the life expectancy at birth was estimated to be 59 years for Indigenous males and 65 years for Indigenous females—similar to the respective life expectancy for the Australian male population in 1901–1910 and the female population in 1920–1922 (ABS & AIHW 2005). In contrast, the average life expectancy at birth for all Australians for the period 1998–2000 was 77 years for males and 82 years for females. In other words, the gap was at least 17 years.

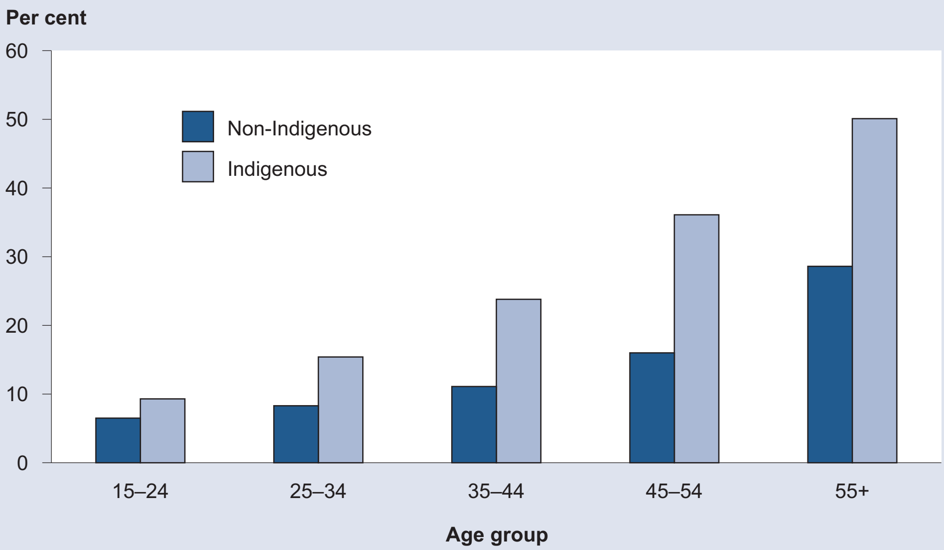
Box 3.2: Estimating life expectancy for Aboriginal and Torres Strait Islander peoples

To estimate life expectancy, accurate information on the total population, births and deaths and migration is needed. Because of the uncertainty about the estimates of these components for Indigenous Australians, indirect methods are used to estimate life expectancy for the Indigenous population.

Over the years, a number of indirect methods have been used to estimate life expectancy for Aboriginal and Torres Strait Islander peoples. The methods all rely on different assumptions and subjective expert opinions (Bhat 2002; Preston & Hill 1980; Vos et al. 2007) and there is no direct way of verifying the accuracy of the different estimates they yield. However, despite the varying underlying assumptions used, all find a very large disparity in life expectancy between Indigenous and non-Indigenous Australians.

Self-assessed health status

Self-assessed health status provides an indication of a person's overall health and many studies have found that it is a strong predictor of how long they are likely to live (Quesnel-Vallee 2007). In 2004–05, 22% of Indigenous Australians aged 15 years and over reported their health as fair or poor. After adjusting for differences in the age structure of the Indigenous and non-Indigenous populations, Indigenous people were almost twice as likely as non-Indigenous people to have reported fair or poor health. In both populations, the proportion of people with fair/poor health increased with age (Figure 3.3).



Source: AIHW analysis of 2004–05 NATSIHS.

Figure 3.3: Proportion of Australians aged 15 years and over who assessed their health status as fair or poor, by Indigenous status and age group, 2004–05

Disability and ill health

Disability

The 2002 National Aboriginal and Torres Strait Islander Social Survey provided information on the prevalence of disability among Indigenous Australians for the first time. From the survey it was estimated that 102,900 Indigenous persons aged 15 years or over (36% of that age group) had a disability or a long-term health condition. Of these, 21,800 or 8% of the Indigenous population aged 15 years or over had a profound or severe core activity limitation—meaning they always or sometimes needed assistance with at least one core activity of everyday living. Overall, the proportion of Indigenous males with a disability or long-term health condition (37%) was similar to the rate for females (36%). This rate increased with age for both sexes. Among Indigenous people aged 65 years and over, 77% of males and 69% of females had a disability or long-term health condition (ABS 2007a).

Indigenous people have higher rates of profound or severe core activity limitations than other Australians. In non-remote areas, the age-standardised rate of Indigenous Australians aged 18 years or over with a profound or severe core activity limitation was 2.1 times that of the non-Indigenous population (ABS & AIHW 2005).

Prevalence of selected long-term health conditions

Information about the self-reported prevalence of various long-term health conditions among Aboriginal and Torres Strait Islander peoples is available from the 2004–05 National Aboriginal Torres Strait Islander Health Survey (NATSIHS). In 2004–05, eye or sight problems (30%), respiratory diseases (27%), musculoskeletal problems (22%) and diseases of the circulatory system (12%) were the types of long-term conditions most commonly reported (ABS 2006b). Table 3.1 shows the reported prevalence of various long-term health conditions and Indigenous to non-Indigenous rate ratios for these conditions, after adjusting for differences in the age structures of the two populations.

Table 3.1: Prevalence of selected long-term health conditions by Indigenous status (per cent), and age-standardised rate ratios, 2004–05

Condition	Indigenous	Total Australians	Standardised rate ratios[(a)]
Eye/sight problems	30	52	0.9
Musculoskeletal diseases	22	31	1.1
Arthritis	9	15	1.2
Diseases of the respiratory system	27	29	1.1
Asthma	15	10	1.6
Circulatory problems/diseases	12	18	1.3
Endocrine, nutritional and metabolic diseases	9	12	1.6
Diabetes/high sugar levels	6	4	3.4
Diseases of the nervous system	8	8	1.2
Digestive diseases	4	7	0.9
Total population[(b)]	**474,300**	**19,681,500**	

(a) Age-standardised using the estimated resident population of Australia as at 30 June 2001.

(b) Indigenous and Total Australian Estimated Resident Population as at 31 December 2004.

Note: Components may not add to total as persons may have reported more than one type of condition.

Sources: ABS 2006a, 2006b.

Dental health

The dental health of Aboriginal and Torres Strait Islander peoples is worse than for other Australians, both for children and adults (AHMAC 2006). For example, based on data from the New South Wales (2000), South Australian (2003) and Northern Territory (2002) child dental health surveys, the average number of decayed, missing and filled teeth per child was much higher for Aboriginal and Torres Strait Islander children than for other Australian children. Trend data from the Northern Territory indicate that the dental health of Indigenous children has not improved since 1991. Based on information about adults seeking dental care in 2000–01, Indigenous adults also had a greater average number of decayed and missing teeth and a lower average number of filled teeth than non-Indigenous adults across most age groups (ABS & AIHW 2008).

Mental health and social and emotional wellbeing

Until the 2004–05 NATSIHS, there was a scarcity of national survey data on the mental health and social and emotional wellbeing of Indigenous Australians, partly because there was no agreement on an appropriate method of assessment. In that survey, for the first time a module was included that captured eight aspects of social and emotional wellbeing: psychological distress (using five questions from the Kessler Psychological Distress Scale); the impact of psychological distress; positive wellbeing (using selected questions from the Short Form 36 Health Survey); feelings of anger; stressors; perceptions of discrimination; cultural identification; and removal from family (ABS 2006b). Data on psychological distress and its impact are described below.

Psychological distress and its impact

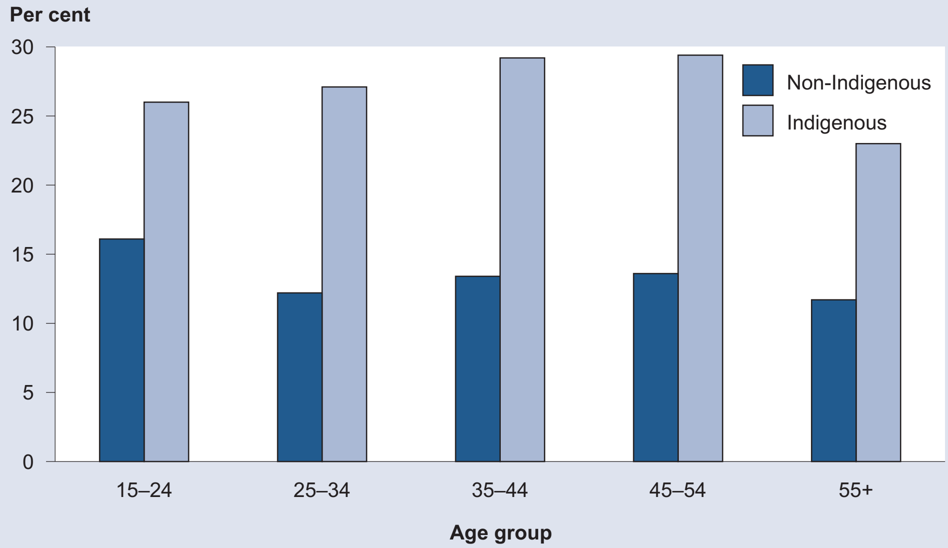
The responses to the five psychological distress items in the 2004–05 NATSIHS were scored and summed to create a 'Kessler-5' psychological distress score. The results indicated that 27% of Indigenous adults had high or very high levels of psychological distress, with Indigenous females significantly more likely than Indigenous males to report such levels (32% and 21%, respectively) (AIHW 2008 forthcoming). Among non-Indigenous adults, females were similarly more likely than males to report high or very high levels of psychological distress.

A higher proportion of Indigenous adults than non-Indigenous adults reported high/very high levels of psychological distress in every age group (Figure 3.4). After taking into account differences in the age structure of the two populations, Indigenous Australians were twice as likely as non-Indigenous Australians to report high or very high levels of psychological distress (AIHW 2008 forthcoming).

Among Indigenous adults who indicated some level of psychological distress in the NATSIHS (that is, those who answered 'a little of the time', 'some of the time', 'most of the time' or 'all of the time' to at least one K-5 question), 21% indicated they had been unable to work or carry out their normal activities because of their distress for at least 1 day during the previous 4 weeks, and around 12% had seen a doctor or other health professional at least once for this reason over the same period. One in seven (15%) of those who indicated some level of psychological distress indicated that physical health problems were the main cause of these feelings all or most of the time.

The relatively high proportion of Indigenous people reporting high/very high levels of psychological distress is consistent with their high rates of use of mental health services compared with other Australians. For example, in 2004–05 the number of community mental health service contacts for Indigenous Australians was 2.3 times the rate for other

Australians (AIHW 2007b). In 2003–04, the rate of mental-health-related encounters with general practitioners for Indigenous Australians was 1.2 times the rate for other Australians (AIHW 2007b).



Source: AIHW analysis of 2004–05 NATSIHS.

Figure 3.4: High/very high levels of psychological distress (K-5) among Australians aged 18 years and over, by Indigenous status and age, 2004–05

Use of primary health-care services

Indigenous Australians can access primary health-care services through consultations with general practitioners in mainstream services or through Aboriginal and Torres Strait Islander specific services. The 2004–05 NATSIHS showed that 60% of Indigenous people usually visited a GP if they had a problem with their health, and most (91%) usually visited the same GP or a medical service (AIHW 2007a). Therefore information about GP consultations with Indigenous Australians can provide important insights about the state of Indigenous health.

Information on consultations with general practitioners comes from the BEACH survey. Over the period 2001–02 to 2005–06, there were 7,682 GP consultations with Aboriginal and Torres Strait Islander patients recorded in the survey, representing 1.5% of total GP consultations. Indigenous people present to GPs with essentially the same range of problems as non-Indigenous Australians, although with higher consultation rates for diabetes and circulatory conditions (Table 3.2). Although survey data indicate that there are much higher rates of psychological distress in Indigenous communities (Figure 3.4), Indigenous people appear to access GPs for psychological consultations at the same rate as non-Indigenous people (Table 3.2). It is difficult, however, to know whether this is a reflection of the undercount (that is, under-identification) of Indigenous patients or actual lower use of general practice by Indigenous Australians. However, other evidence, such as continuing lower levels of access to MBS-funded services (AHMAC 2006), suggests that gaps in access to primary health-care and specialist services persist (see Chapter 7 for more information).

Health services that are initiated, controlled and operated by the Indigenous community have the potential to increase the level of access for Aboriginal and Torres Strait Islander peoples by providing holistic and culturally appropriate care. Aboriginal and Torres Strait Islander primary health-care services offer clinical care, screening programs, and a wide range of preventive health-care activities. They also offer health-related and community support services including social and emotional wellbeing services, substance use treatment, men's and women's support groups, transport to medical appointments and school-based activities. The Australian Government provided funding to 151 Aboriginal and Torres Strait Islander primary health-care services in 2005–06 (see Chapter 7 for more information). State and territory governments also provide a number of community-based Indigenous-specific primary health-care services.

In the 2005–06 Budget, the Australian Government announced funding for the *Healthy for Life* program. This program aims at enhancing the capacity of Indigenous primary health-care services to improve the quality of child and maternal health care and chronic disease care. Currently around 80 services providing health care to Indigenous Australians are participating in the *Healthy for Life* program. These include health services funded by the Australian Government and state and territory governments and services which are part of the Division of General Practice.

Health checks for Indigenous children under the age of 16 years are a key component of the Australian Government's Northern Territory Emergency Response, which began in 2007. Around 17,000 Indigenous children in this age group live in the Aboriginal communities or town camps in the Northern Territory that fall within the scope of the Child Health Check Initiative. The purpose of the health checks, which are voluntary, is to identify significant health issues and to plan follow-up treatment to improve the health of Aboriginal children. In addition to a comprehensive examination of the child's health, the health check covers the child's medical history and their social and environmental living conditions, including housing situation. The checks also include organising investigations and referrals as required, and providing preventive health advice. The AIHW is responsible for managing and analysing the health data resulting from these child health checks.

Table 3.2: Problems managed by general practitioners at encounters with Indigenous and other patients, 2001–02 to 2005–06

	Number per 100 encounters[b]		
Problems managed[a]	**Indigenous**	**Other**	**Ratio**
Respiratory	20.3	19.8	1.0
Skin	14.7	16.9	0.9
Musculoskeletal	15.3	17.3	0.9
Endocrine and metabolic	18.6	11.3	1.6
Diabetes—non gestational	10.2	3.1	3.3
Circulatory	19.8	16.7	1.2
Psychological	12.0	11.6	1.0
Digestive	10.9	10.0	1.1
Pregnancy & family planning	4.7	4.4	1.1
Ear	4.1	4.0	1.0
Other	35.9	36.7	1.0
Total problems	**156.4**	**148.8**	**1.1**

(a) Classified according to ICPC-2 chapter codes (Classification Committee of the World Organization of Family Doctors 1998).
(b) Rates are directly age-standardised using the total encounters over the period 2001–02 to 2005–06.

Source: BEACH survey of general practice, Australian General Practice Statistics and Classification Centre.

Hospitalisation

Hospitalisation statistics are not a measure of the prevalence or incidence of a disease, but can provide some insights into the health status of various population groups and the patterns of their illness (see Box 7.9 for more information about terms and data sources relating to hospital use). In 2005–06, the most common diagnosis for Indigenous Australians admitted to hospitals was 'care involving dialysis', a procedure used in treating kidney failure. Indigenous Australians were also commonly hospitalised for injury (such as assault and attempted suicide), respiratory diseases (such as influenza and pneumonia), digestive diseases (such as diseases of the liver, intestines and mouth) and mental and behavioural disorders (such as schizophrenia and those resulting from psychoactive substance use).

Hospitalisation rates for Indigenous Australians were higher for most diagnoses than for other Australians (Table 3.3). They were hospitalised for care involving dialysis at 14 times the rate of other Australians; and for endocrine, nutritional and metabolic diseases—which includes diabetes—at 3 times the rate of other Australians.

Table 3.3: Hospitalisations of Indigenous Australians, by principal diagnosis, 2005–06

Principal diagnosis (ICD-10-AM chapter)	Observed hospitalisations	Expected hospitalisations	Ratio[(a)]
Care involving dialysis	100,153	7,392	14
Injury & poisoning & certain other consequences of external causes	18,843	9,383	2
Diseases of the respiratory system	15,722	6,877	2
Diseases of the digestive system	12,906	13,342	1
Mental and behavioural disorders	10,083	5,318	2
Symptoms, signs and abnormal clinical and laboratory findings, nec	10,461	6,723	2
Diseases of the circulatory system	7,859	3,799	2
Diseases of the genitourinary system	6,220	5,614	1
Diseases of the skin & subcutaneous tissue	5,599	2,073	3
Certain infectious and parasitic diseases	5,249	2,562	2
Endocrine, nutritional and metabolic diseases	4,797	1,610	3
Other[(b)]	45,150	44,054	1
Total[(c)]	**243,106**	**108,793**	**2**

nec = not elsewhere classified

(a) Ratio = observed hospitalisations divided by expected hospitalisations. Expected hospitalisations are calculated based on the age, sex and cause-specific rates of other Australians.

(b) Includes diseases of the musculoskeletal system and connective tissue, neoplasms (including cancer), diseases of the nervous system, certain conditions originating in the perinatal period, diseases of the ear and mastoid process, diseases of the eye and adnexa, diseases of the blood and blood-forming organs and certain disorders involving the immune system, congenital malformations, deformations and chromosomal abnormalities, and factors influencing health status and contact with health services (excluding dialysis).

(c) Includes hospitalisations for which no principal diagnosis was recorded.

Note: Data are for New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory.

Source: AIHW National Hospital Morbidity Database.

Mortality

In the four jurisdictions which are considered to have the most complete coverage of Indigenous deaths, about 71% of Indigenous Australians who died in the period 2001–2005 were younger than 65 years. This is in stark contrast to the non-Indigenous population, where the corresponding proportion was 21% (Figure 3.5).

Note: Data for Queensland, Western Australia, South Australia and the Northern Territory combined. Based on year of registration of death.

Source: AIHW National Mortality Database.

Figure 3.5: Age distribution of deaths among Indigenous and non-Indigenous people, 2001–2005

All-cause death rates for Indigenous males and females were at least twice as high, across all age groups, as those for non-Indigenous males and females except for the 65 years and over group, where the ratio was only 1.4. The greatest differences occurred among those in the 25–44 years and 45–64 years groups, where the rate ratio was at least 4.

Indigenous people had death rates in excess of the non-Indigenous population for almost all causes of death. In 2001–2005, the three leading causes for Aboriginal and Torres Strait Islander peoples in the four jurisdictions were diseases of the circulatory system, external causes of morbidity and mortality (mainly accidents, intentional self-harm and assault) and neoplasms (including cancer). Deaths from these causes accounted for 58% of all Indigenous deaths compared with 73% among the non-Indigenous population. However, the Indigenous death rates for these three main groups of causes were markedly higher than for non-Indigenous people. Furthermore, Indigenous males and females died at about 8 and 10 times the rates of non-Indigenous males and females respectively from endocrine, nutritional and metabolic diseases—mainly diabetes (Table 3.4).

Table 3.4: Indigenous deaths, main causes, 2001–2005

	Standardised mortality rate[(a)]	
Cause of death	**Males**	**Females**
Diseases of the circulatory system	3.2	2.7
External causes	2.9	3.5
Neoplasms (including cancer)	1.5	1.6
Endocrine, nutritional and metabolic diseases	7.5	10.1
Diabetes	10.8	14.5
Diseases of the respiratory system	4.3	3.6
Diseases of the digestive system	5.8	5.1
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	6.0	4.6
Certain conditions originating in the perinatal period	2.9	2.3
Diseases of the genitourinary system	4.8	6.0
Diseases of the nervous system	2.9	1.6
Certain infectious and parasitic diseases	5.1	5.0
Mental and behavioural disorders	5.8	3.1
All causes	**3.0**	**2.9**

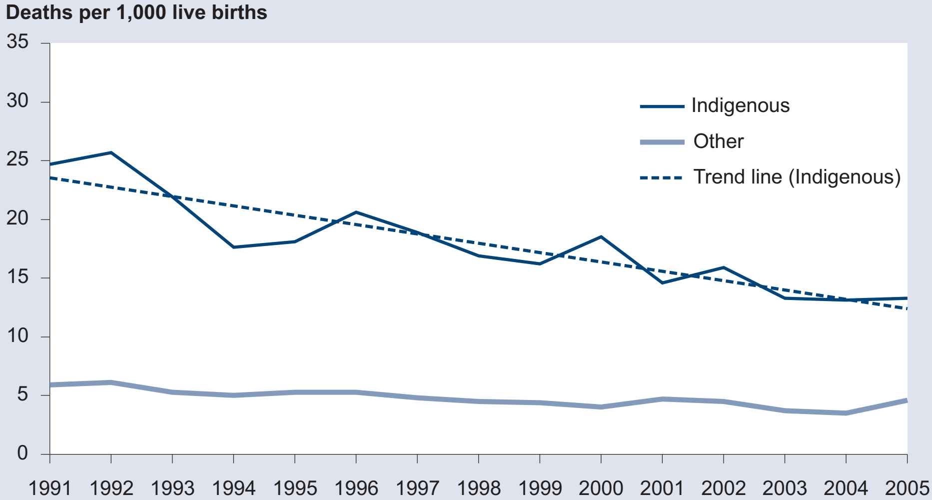
(a) Standardised mortality rate = observed Indigenous deaths divided by expected Indigenous deaths, based on the age, sex and cause-specific rates for non-Indigenous Australians.

Note: Data for Queensland, Western Australia, South Australia and the Northern Territory combined. Deaths are based on year of registration of death. Disease groupings are based on ICD-10 chapter.

Source: AIHW National Mortality Database.

Trends in mortality

Despite the continuing high rate of Indigenous infant mortality, the gap compared with other infants is narrowing. A significant decline occurred in infant mortality for both Indigenous infants and other infants in Western Australia, South Australia and the Northern Territory combined during the period 1991–2005 (Figure 3.6). Both the absolute and relative difference in mortality rates between Indigenous and other infants declined significantly over this period. The rate difference declined by around 54% between 1991 and 2005 (from 19 per 1,000 births to 9 per 1,000 births over this period) and the rate ratio declined by around 30% from 4.3 in 1991 to 3.0 in 2005.

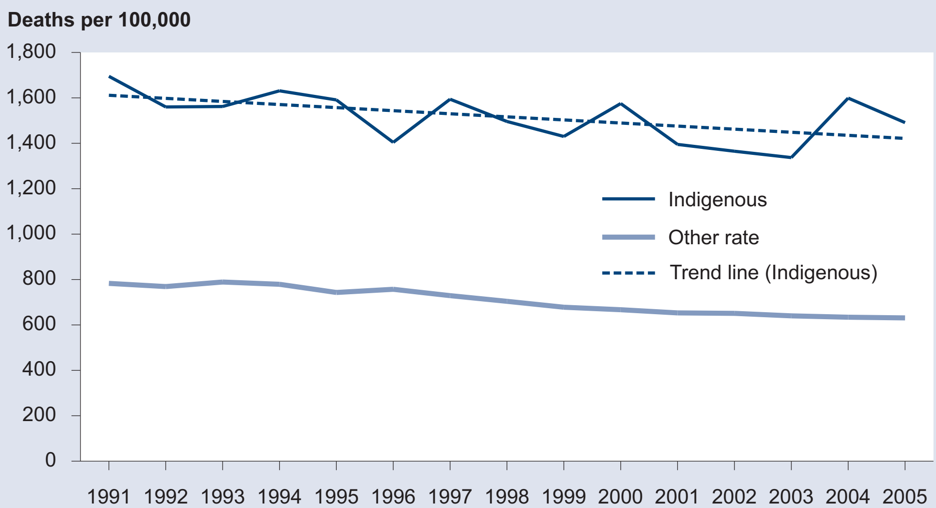


Note: Deaths are based on year of registration of death. Births are based on year of registration.

Source: AIHW National Mortality Database.

Figure 3.6: Infant mortality rates, by Indigenous status, Western Australia, South Australia and the Northern Territory, 1991–2005

All-age mortality rates for Indigenous Australians have also declined but, in contrast to the narrowing gap in infant mortality rates, they have not declined as much as those for other Australians. Between 1991 and 2005, there was a significant decline in overall mortality rates for Indigenous Australians in Western Australia, South Australia and the Northern Territory combined (Figure 3.7). The average yearly decline was around 14 deaths per 100,000 population, which is equivalent to a reduction of around 14% during the 15-year period of analysis.



Note: Deaths are based on year of registration of death and state of usual residence.

Source: AIHW National Mortality Database.

Figure 3.7: Age-standardised mortality rates by Indigenous status, Western Australia, South Australia and the Northern Territory, 1991–2005

Over the same period, there was a significant decline in recorded mortality rates for other Australians. The average yearly decline in the death rate was around 13 per 100,000, which is equivalent to a reduction of around 23%. This means that the gap in mortality between Indigenous and non-Indigenous Australians is widening.

Moreover, of the five main causes of death examined over this 15-year period—neoplasms (including cancer), endocrine, nutritional and metabolic diseases, diseases of the circulatory system, diseases of the respiratory system, and injury—only deaths from diseases of the circulatory system showed a consistently significant decline among Indigenous Australians over the period 1997–2005.

Health risk factors

As explained in Chapter 4, health risk factors are characteristics that signify an increased risk of developing a particular disease or condition. They can be demographic, behavioural, biomedical, genetic, environmental or social. The material presented below focuses on a number of behavioural risk factors—including obesity, physical inactivity, poor nutrition and substance use—before discussing the effect of housing conditions on the health of Indigenous Australians.

Obesity, physical inactivity and poor nutrition

In the 2004–05 NHS, of those who self-reported their height and weight, 38% of Indigenous people aged 15 years and over had a healthy weight, 28% were overweight and 29% were obese. The rate of overweight or obesity was similar among males and females and increased with age, from 37% among those aged 15–24 years to 74% among those aged 55 years and over. The rates of overweight or obesity among Indigenous Australians in non-remote areas increased from 48% in 1995 to 56% in 2004–05 (ABS 2006b).

After adjusting for age differences, Indigenous females were around one and a half times as likely to be overweight or obese as non-Indigenous females, whereas the rates were similar among Indigenous and non-Indigenous males.

The 2004–05 NATSIHS also found that 75% of Indigenous respondents aged 15 years and over living in non-remote areas were sedentary or had low levels of physical activity in the 2 weeks before the survey. When age differences were taken into account, Indigenous people were 1.5 times as likely as non-Indigenous people to report being sedentary (AIHW 2007a).

Fruit and vegetable consumption is linked to prevention of chronic diseases. In 2004–05, 5% of Indigenous Australians aged 12 years and over reported no daily vegetable intake and 14% reported no daily fruit intake. Daily vegetable and fruit intake varied by remoteness—2% of Indigenous people living in non-remote areas reported no daily vegetable intake compared with 15% in remote areas; and 12% of Indigenous people living in non-remote areas reported no daily fruit intake compared with 20% in remote areas (ABS 2006b).

Information on the number of serves of fruit and vegetables consumed was collected in non-remote areas only. Among Indigenous people living in non-remote areas, 42% were eating the National Health and Medical Research Council's recommended daily intake of fruit (two or more serves daily) and only 10% the recommended daily intake of vegetables (five or more serves daily)(NHMRC 2003a, 2003b). For Indigenous people living in remote areas, access to a range of food items, including fruit and vegetables, is limited. This is due to the higher costs for handling and transporting goods to remote communities, the lack of appropriate storage facilities within communities and the lack of suitable local produce to purchase (NHMRC 2000).

Over a long period, the traditional fibre-rich, high protein, low saturated fat diet of many Aboriginal and Torres Strait Islander communities has changed to one which is high in refined carbohydrates and saturated fats. Such changes, along with physical inactivity, have increased the risk of obesity and chronic disease, including Type 2 diabetes.

Smoking, alcohol consumption and illicit drug use

The 2004–05 NATSIHS found that half (50%) of the Indigenous population aged 18 years or over were daily cigarette smokers. A similar proportion of males (51%) and females (49%) were daily smokers, with the highest rates reported by those aged 25–44 years. Although there was little difference between the overall proportions of Indigenous people in remote and non-remote areas who smoked, males in remote areas were somewhat more likely to smoke than males in non-remote areas (58% compared with 49%). Smoking is much more prevalent among Indigenous than non-Indigenous Australians. After adjusting for age differences, Indigenous people aged 18 years or over were more than twice as likely to be current smokers (ABS 2006a, 2006b).

Overall, Indigenous Australians are less likely to drink alcohol than non-Indigenous Australians. However, among those who drink, a higher proportion of Indigenous Australians drink at risky or high-risk levels.

After adjusting for age differences between the two populations, a higher proportion of Indigenous Australians reported that they had not consumed any alcohol in the last 12 months than did non-Indigenous Australians (29% compared with 15%) (ABS 2004–05 NATSIHS unpublished data). However, among those who drink, the rate of long-term risky or high-risk drinking of Indigenous Australians was 34% compared with 22% among non-Indigenous Australians. Indigenous males were more likely to drink at long-term risky or high-risk levels than Indigenous females.

In 2004–05, around two thirds (64%) of Indigenous respondents aged 18 years and over who drank reported drinking at short-term risky or high-risk levels (sometimes referred to as binge drinking) on at least one occasion in the last 12 months and 23% reported drinking at these levels at least once a week. Young males aged 18–24 years were the most likely of any age group to drink at risky levels on a weekly basis. Overall, short-term risky drinking was more common among Indigenous males than females. After adjusting for age differences between the two populations, of those who drank, Indigenous Australians were 3 times as likely as non-Indigenous Australians to drink at short-term risky or high-risk levels at least once a week in the last 12 months and 1.4 times as likely to drink at short-term risky or high-risk levels on at least one occasion in the last 12 months.

In 2004–05, an estimated 28% of Indigenous people aged 15 years and over living in non-remote areas had used an illicit substance in the preceding 12 months (recent use) and around half (49%) had tried at least one illicit substance in their lifetime. Indigenous males were more likely to report recent use of illicit drugs than females (32% compared with 25%) and recent drug use was highest among those aged 25–34 years (38%). As no data were collected on illicit substance use for non-Indigenous people in the 2004–05 National Health Survey, results from the 2004 National Drug Strategy Household Survey are used to compare illicit drug use among Indigenous and non-Indigenous Australians. These results showed that 27% of Indigenous Australians aged 14 years and over reported using illicit substances in the last 12 months—about twice the rate estimated for non-Indigenous Australians (15%) in the same survey (AIHW 2005a).

Housing conditions

Housing has been identified as a major influence on the health of Aboriginal and Torres Strait Islander peoples. Inadequate or poorly maintained housing and the absence of functioning infrastructure can pose serious health risks. Overcrowded dwellings and poor-quality housing have been associated with the poor physical and mental health of the occupants. Many Indigenous people live in houses that are overcrowded and that do not satisfy the basic Australian standards for shelter, safe drinking water and adequate waste disposal.

According to the 2006 Census of Population and Housing, there were 166,669 Indigenous households in Australia that year (that is, households in which there was at least one Indigenous resident), representing 2.3% of all Australian households. About one-third (34%) of Indigenous households were owned or being purchased by a household member, 30% were private and other renters, 20% were renting from state or territory housing authorities and 9% were renting from Indigenous or mainstream community organisations (ABS & AIHW 2008).

In 2006, an estimated 14% of Indigenous households (nearly 21,000) in Australia were overcrowded. This equates to around 102,400 Indigenous people (around 1 in 4) living in overcrowded accommodation. Overcrowding in 2006 varied significantly by tenure type, with the highest rates among Indigenous households renting Indigenous community housing (40%) (ABS & AIHW 2008).

The 2006 Community Housing and Infrastructure Needs Survey collected data on dwelling condition for permanent dwellings in discrete Indigenous communities. Across Australia, an estimated 6,674 Indigenous community housing dwellings (31%) required major repair or replacement. Dwellings located in Remote and Very Remote areas tended to be in the poorest condition.

Connection to water, sewerage or electricity services is an issue for those households in Indigenous communities that are not connected to one or more of these essential services. Between 2001 and 2006 there was a marked decrease in the number of communities and permanent dwellings not connected to an organised sewerage system. The number of dwellings in communities not connected to a sewerage system fell from 153 in 2001 to 51 in 2006. There was a small decrease in the number of dwellings in communities not connected to a water supply, which fell from 13 to 10, but also a small increase in the number of permanent dwellings in communities not connected to an electricity supply from 80 to 85 (ABS & AIHW 2008).

3.3 People in rural and remote areas

Australia's rural and remote regions reflect the variety of Australian life. Often understood as the hot, dry, farming 'outback' or 'bush', these regions actually include many geographical landscapes. Despite this variation, however, those who live in rural and remote areas generally have poorer health than their major city counterparts, reflected in their higher levels of mortality, disease and health risk factors.

This section describes 'rural and remote' and other geographical terms (Box 3.3), outlines some major background considerations and then summarises the health of those living in these outer areas.

Defining 'rural and remote'

Defining 'rural and remote' is challenging because of the diversity of these areas. In summary, they are all those areas outside Major Cities (see Box 3.3). This means that about one-third (32%) of Australians live in rural and remote areas—29% in regional areas and 3% in remote areas.

Box 3.3: Classifying the areas where we live

The ABS Australian Standard Geographical Classification Remoteness Areas classification (ABS 2001a) allocates one of five remoteness categories to areas depending on their distance from different sized urban centres, where the population size of the urban centre is considered to govern the range and type of services available.

Areas are classified as Major Cities; Inner Regional or Outer Regional (referred to here as 'regional' when taken together); or Remote and Very Remote ('remote' when taken together). The term 'rural and remote' is used here when referring generally to areas outside Major Cities.

All the above terms are used in the following discussion.

Population surveys are not always able to produce reliable estimates for Remote and/or Very Remote areas. For this reason, data for these areas are combined or included with data from Outer Regional areas in some of the following presentation.

Indigenous Australians are important in any discussion about the health of people living in rural and remote areas. Although they make up 2.5% of the total Australian population, Aboriginal and Torres Strait Islander peoples constitute 24% of the population in remote areas, including 45% of the population in Very Remote areas (Table 3.5). This means that information about the health of Australians living in remote areas is often influenced by the generally poorer health status of the Indigenous population living in those areas. See Section 3.2 for further information about the health of Aboriginal and Torres Strait Islander Australians.

Characteristics of rural and remote populations

It is useful to consider some of the socioeconomic and environmental factors which can affect health in rural and remote areas. These factors can illustrate that people living there do not always have the same opportunities for good health as those living in major urban centres. Residents of more inaccessible regions of Australia are generally disadvantaged in their educational and employment opportunities, income and access to goods and services. In some areas, they also have less access to basic necessities such as fresh fruit and vegetables (AIHW 2008). Education levels are lower in rural and remote areas compared with Major Cities, with Very Remote areas having the lowest levels of school completion (48% of the population left school at year 10 level or below, according to the 2006 Census) (Table 3.5).

In 2006, over half (53%) of all Very Remote areas were classified as being in the bottom quarter of Australian socioeconomic areas. In contrast, only one in fifty of these areas were in Australia's top quarter.

Table 3.5: Selected characteristics of Indigenous and total population, by remoteness areas, 2006

Selected characteristics	Major Cities	Inner Regional	Outer Regional	Remote	Very Remote	Australia[(a)]
			Per cent			
Total population living in each area	68	20	9	2	1	100
Indigenous population living in each area	32	22	22	9	15	100
Population in each area who are Indigenous[(b)]	1	3	5	13	45	2
Adults employed in primary production and mining[(c)]	<1	3	8	13	10	2
Adults employed in other industry sectors	45	39	36	32	30	43
Indigenous adults not in workforce or unemployed	53	57	56	53	58	54
Highest level of non-school qualification obtained[(d)]						
Bachelor degree or higher	20	11	10	9	8	17
Certificate or Diploma	25	28	26	24	20	26
Highest level of school completion[(d)]						
Year 12 or equivalent	48	33	31	32	26	43
Year 10 or equivalent or below	32	47	47	43	48	37
Areas classified as being in the top quarter of socioeconomic areas ('best-off')[(e)]	34	14	8	10	2	26
Areas classified as being in the bottom quarter of socioeconomic areas ('worst-off')[(e)]	20	28	33	26	53	24
Reticulated water supplies adequately fluoridated[(f)]	81	39	34	30	20	49
			Average costs (dollars)			
Median gross household income (weekly)	1,084	854	841	1,004	977	1,027
Housing loan repayments (monthly)	1,400	1,083	979	1,000	977	1,027
Median household rent (weekly)	220	160	140	119	60	200

(a) Offshore, shipping and migratory census district areas have been included in the total for Australia.

(b) Percentages are based on the ABS Census file as at December 2007 and the estimated Indigenous population differs slightly from estimates presented elsewhere.

(c) Primary production includes agriculture, forestry and fishing.

(d) Percentage of the population aged 20 years and over.

(e) These figures are based on the Index of Relative Socio-Economic Disadvantage, one of four Socioeconomic Indexes for Areas developed by the ABS (see Box 3.1). In this table, the figures refer to those Census Collection Districts classified as being the 25% least disadvantaged ('best-off'), and the 25% most disadvantaged ('worst-off').

(f) Fluoridation data are derived from a rolling survey, and do not relate specifically to 2007 (AIHW 2005b).

Note: Data on employment are for persons aged 15 years and over.

Source: AIHW analysis of ABS Census 2006.

Compared with those in major urban centres, Australians living in rural and remote areas generally have less access to primary health-care services and staff (AIHW 2005b), more driving risks (such as poorer road conditions and longer travelling time), longer patient transport times, and more jobs with higher risks, such as primary production and mining (Table 3.5).

Despite these general patterns there is considerable variation within each geographical area that is masked in the broad statistics presented. For example, there is evidence that mortality rates differ between inland and coastal regions, as well as between statistical local areas with the same remoteness category (AIHW 2003a, 2007d). The relative prosperity of Australia's rural areas, and the health of people living there, can be dramatically influenced by climatic conditions such as drought, by natural disasters and by the availability of natural resources. These conditions can affect population migration, employment and demand for infrastructure and services, observed most recently in the growth of mining communities. Therefore, remoteness does not necessarily mean poorer health, just as living in major urban centres does not guarantee good health.

A major problem in understanding the health characteristics of people in rural and remote areas is the limited availability, representativeness and quality of data. Few data sources are complete, accurate, regionally representative and unambiguous enough to allow meaningful comparisons (AIHW 2008). This is particularly so for remote areas, partly because of their size and the difficulties in surveying them. Further, the quality of Indigenous identification varies across different administrative data collections and surveys, within data collections over time, and between regions, making it difficult to disentangle the extent to which 'rural and remote' issues are related to Indigenous issues. This is a key challenge for health policy in rural and remote health, particularly in remote areas, where Indigenous Australians make up a larger proportion of the population. For example, overall rates of cervical cancer deaths tend to be higher in Very Remote areas, but not for non-Indigenous people who live there (AIHW 2008).

Health status

Specific health status measures illustrate the generally poorer health of people living in rural and remote areas. Life expectancy decreases with increasing remoteness. Compared with Major Cities, the life expectancy in regional areas is 1–2 years lower and for remote areas it is up to 7 years lower (Table 3.6). The lower life expectancy in remote areas is probably largely due to the reduced life expectancy of Indigenous Australians, which is about 17 years lower than that of Australians overall (ABS & AIHW 2005).

Data from population health surveys and cancer registries show people in rural and remote areas are also more likely to have certain chronic diseases than people living in Major Cities (AIHW 2008). In 2001–03, the incidence of cancer was about 4% higher among people in regional areas than among those in Major Cities, but it was about 10% lower in Very Remote areas (Table 3.6). However, the latter may, at least partly, reflect migration of older, less healthy people to areas where they can access services. Preventable cancers, for example those associated with sun exposure (melanoma) or smoking (lung, head and neck, and lip) and those detectable through screening (cervix), were among the cancers with significantly higher incidence rates in rural and remote areas in 2001–2003 (AIHW 2007e).

Overall, there were no significant inter-regional differences in the prevalence of depression. However, males aged 45–64 years living in rural and remote areas were 1.4 times as likely to report depression as males of the same age in Major Cities. Males in Outer Regional and

Remote areas were 1.2 times as likely to report high to very high levels of psychological distress (Table 3.6).

Females in rural and remote areas were 1.3 times as likely to report diabetes and 1.2 times as likely to report arthritis as those in Major Cities. Overall, self-reported rates of cerebrovascular disease (stroke) and coronary heart disease (such as heart attack) were similar across remoteness areas for both males and females. The ABS method for counting stroke and coronary heart disease was used in this analysis and differs from that used elsewhere in this report (see Box 5.3).

Children living in rural and remote areas tended to have more decayed, missing or filled teeth than those in Major Cities (AIHW 2008). These higher rates may be explained by the lower proportion of adequately fluoridated reticulated water supplies in more remote areas (Table 3.5), and less ready access to dental services.

Table 3.6: Selected health status indicators, by remoteness areas

	Major Cities	Inner Regional	Outer Regional	Remote	Very Remote
			Years		
Life expectancy at birth (males) (2002–04)	79	78	77	77	72
Life expectancy at birth (females) (2002–04)	84	83	83	82	78
			Standardised ratio[(a)]		
Deaths (all ages, 2002–04)	1.00	*1.07	*1.12	*1.18	*1.69
Deaths, non-Indigenous (all ages, 2002–04)	1.00	*1.07	*1.11	*1.05	1.00
Deaths < 65 years (2002–04)	1.00	*1.15	*1.29	*1.50	*2.74
Deaths < 65 years, non-Indigenous (2002–04)	1.00	*1.14	*1.23	*1.10	*1.13
Perinatal mortality (2002–04)	1.00	*1.10	*1.19	*1.29	*1.70
Incidence of cancer (2001–03)	1.00	*1.04	*1.03	1.01	*0.91
High/very high psychological distress (males) (2004–05) [(b)]	1.00	1.05	*1.24	n.a.	n.a.
High/very high psychological distress (females) (2004–05) [(b)]	1.00	1.05	1.03	n.a.	n.a.

* Statistically significant difference from Major Cities.

(a) The difference in rates between Major Cities and regional and remote areas has been described using a standardised ratio, where Major Cities is equal to 1.00. This ratio tells us how much higher rates in regional and remote areas were than expected if Major Cities rates had applied everywhere.

(b) Outer Regional column is Outer Regional and Remote areas combined. No data are available for Very Remote areas.

Source: AIHW 2008.

Mortality

When deaths in rural and remote areas are compared directly with those in Major Cities, the rates are higher. These higher rates are partly influenced by the larger proportion of Aboriginal and Torres Strait Islander peoples living in these areas and the Indigenous population's higher rates of mortality. Compared with those in Major Cities, rates of death in regional areas were 1.1 times as high for people of all ages and 1.2 times as high for people aged under 65 years. For Very Remote areas, death rates were 1.7 times as high for people across all ages and 2.7 times as high for people aged under 65 years (AIHW 2007d).

This corresponds to about 4,400 additional deaths annually, over and above the number expected if rural and remote age-specific death rates were the same as in Major Cities (Table 3.7). Of these 'excess' deaths, 86% occurred in regional areas and 14% in remote.

The main contributors to elevated death rates outside Major Cities were coronary heart disease (19% of 'excess' deaths), 'other' circulatory disease (18%) and motor vehicle accidents (9%)(Table 3.7). For people less than 65 years, injury (in particular, motor vehicle accidents and suicide) contributed most notably to elevated death rates, and these deaths were mainly male.

Compared with Major Cities, perinatal death rates increase with remoteness (from 1.1 times in Inner Regional areas to 1.7 times as high in Very Remote areas). Also of interest are the lower death rates of older people living in remote areas. As with the lower rates of cancer observed in remote areas, this may reflect the migration of frail aged people to less remote areas, where more services are available (AIHW 2007d).

Table 3.7: Leading causes of 'excess' deaths outside Major Cities, 2002–04

Cause of death	Average annual 'excess' deaths	Per cent of total annual 'excess' deaths
Coronary heart disease	845	19
'Other' diseases of the circulatory system	807	18
Motor vehicle accident	416	9
Chronic obstructive pulmonary disease	387	9
'Other' neoplasms	325	7
Diabetes	267	6
'Other' injuries	221	5
Suicide	186	4
Prostate cancer	182	4
Lung cancer	177	4
Other causes	604	13
Total	**4,418**	**100**

Note: Due to rounding, numbers in table may not add to 100.

Source: AIHW 2007d.

With some brief interruptions, overall death rates have been declining in Australia since records began. Observing the period 1992–2003 in particular, the decline has been evident across all geographic regions, and across the various causes of death there have generally been faster declines in remote areas, where death rates tended to be higher (AIHW 2006a). The most dramatic declines across all geographic areas have been for deaths attributed to diseases of the circulatory system, asthma and chronic obstructive pulmonary disease.

When all causes of death are considered, the relative difference in mortality rates (the rate ratio) between Major Cities and rural and remote areas remained stable over the period 1992–2003. So although a gap remains in the overall mortality rates of people in Major Cities compared with those in other areas of Australia, this gap is not widening as it is for non-Indigenous and Indigenous Australians (see Section 3.2).

The stability in the rate ratio between Major Cities and other areas was generally consistent across all broad categories of death, with the exception of injury. In Very Remote areas, death rates due to injury increased relative to those in Major Cities, from 2.5 times as high in 1997–1999 to 3.1 times as high in 2002–2004.

Health risk factors

Data from population health surveys show that people in rural and remote areas are more likely to engage in behaviours associated with poorer health, although their diet is likely to include more vegetables (AIHW 2008).

A higher proportion of people living in Remote areas reported daily or current smoking (28%) compared with those living in Major Cities (20%). This difference was particularly marked among males and females aged 25–44 years.

As elsewhere, males in rural and remote areas were generally at a greater risk of harmful drug and alcohol use than females. In 2004–05, the likelihood of males consuming alcohol in quantities that risked harm in the long term increased with remoteness; for example, males in Inner Regional areas were 1.2 times as likely to report doing this as those in Major Cities; and males in Outer Regional and Remote areas were 1.4 times as likely (Table 3.8). With the exception of cannabis, people in rural and remote areas were less likely to report having used illicit drugs compared with those in Major Cities. This may be partly explained by the lower availability of these drugs in more geographically isolated areas.

When compared with those in Major Cities, people living in other areas were more likely to eat the recommended five serves of vegetables per day and were more likely (Inner Regional) or as likely (Outer Regional/Remote) to eat the recommended two serves of fruit (Table 3.8). Australians in rural and remote areas were slightly more likely to be overweight or obese (based on self-reported height and weight) than those living in Major Cities and were also more likely to report sedentary behaviour. The latter was particularly true for males.

Table 3.8: Selected health risk factors by remoteness areas, 2004–05

Risk factor	Major Cities	Inner Regional	Outer Regional/ Remote[(a)]
	Standardised ratio[(b)]		
Smoking (15 years and over)	1.00	*1.15	*1.30
Risky or high-risk alcohol consumption (long-term) (15 years and over) (Males)	1.00	*1.19	*1.41
Risky or high-risk alcohol consumption (long-term) (15 years and over) (Females)	1.00	1.12	1.16
Usually eats less than the recommended daily fruit intake[(c)]	1.00	*0.94	1.04
Usually eats less than the recommended daily vegetable intake[(d)]	1.00	*0.86	*0.85

* Statistically significant from Major Cities.

(a) Outer Regional and Remote areas combined. No data are available for Very Remote areas.

(b) The difference in rates between Major Cities and regional and remote areas has been described using a standardised ratio, where Major Cities is equal to 1.00. This ratio tells us how much higher rates in regional and remote areas were than expected if Major Cities rates had applied everywhere.

(c) Dietary guidelines recommend at least two serves of fruit per day.

(d) Dietary guidelines recommend at least five serves of vegetables per day.

Source: AIHW 2008.

Health care in rural and remote areas

The health-care system in rural and remote areas can be influenced by common factors such as larger client capture areas, smaller populations, fewer general and specialist medical professionals per population, and fewer services. People in rural and remote areas also have different patterns of service use. For example, they make greater use of hospital emergency departments as a source of primary care than people in Major Cities (AIHW 2003a). This can complicate interpretation of rural and remote data on health resource use and access to services.

In 2005–06, hospitals in rural and remote areas were less likely to be nationally accredited than those in Major Cities, although this may partly reflect the varied, and sometimes voluntary, accreditation practices across jurisdictions (AIHW unpublished data). Overall hospitalisation rates also differed across remoteness areas. In 2005–06, hospitalisation rates for people in regional areas were similar to those for Major Cities, but for those living in Very Remote areas they were 1.5 times as high (AIHW 2007a). Hospitalisation rates relating to kidney failure, associated most commonly with diabetes and high blood pressure, were generally higher for more remote areas, particularly for care involving dialysis. Dialysis hospitalisation rates for Very Remote areas were 146 per 1,000 population compared with 44 per 1,000 population in Major Cities. It is likely that this variation relates largely to the high Indigenous hospitalisation rates involving dialysis care and the relatively higher proportion of Indigenous people living in Remote and Very Remote areas.

People living in rural and remote areas were also more likely to be admitted to hospital for conditions which could have potentially been prevented through the provision of non-hospital services and care (AIHW 2007f). This is consistent with the generally lower availability of primary and specialist medical professionals in these areas (AIHW 2005b). Hospitalisation rates for diseases that are preventable with proper vaccination, such as whooping cough, were three times as high in Very Remote areas as in Australia overall (AIHW 2007f).

Current national debate about Australia's health workforce includes a focus on the supply of health workers in rural and remote areas. In 2005, most primary care practitioners (80%) were in Major Cities, providing services for two-thirds (66%) of the Australian population. By comparison, Outer Regional, Remote and Very Remote areas had a relatively low proportion of the practitioner workforce—7% of all primary care practitioners serving 13% of the Australian population (AIHW 2008). For further information on the supply of practitioners, specialists, nurses and dentists across remoteness areas, see Section 8.2 and tables S55–63.

3.4 Prisoners

Prisoner populations are marked by severe disadvantage, stigmatisation, social exclusion and poor physical and mental health. Studies of prison inmates also consistently find they are more likely to engage in risky behaviours such as drug and alcohol use, smoking, and unsafe sexual practices. These social and behavioural factors explain their higher rates of bloodborne viruses such as viral hepatitis, of sexually transmitted infections and of drug dependence, mental illness, and other health problems (Butler & Milner 2003; Butler et al. 2007). It follows that both young and adult prisoners have high death rates and there is also growing evidence of excess mortality among offenders after their release.

On 30 June 2006, there were 25,790 adults imprisoned in Australia, about 1 in 610 adults nationally (ABS 2006c). The median age of prisoners was 33 years and the vast majority (93%) were male. Over the 15 years to 2006, both the overall number of prisoners and the imprisonment rate steadily increased (Table 3.9). This increase was particularly marked for females, with the number of female prisoners more than doubling between 1991 and 2006 (a 115% increase) compared with a 66% increase in the number of male prisoners (Table 3.9). In 2006, New South Wales had the greatest number of prisoners (9,822 or 38% of the Australian total), followed by Queensland (5,562 or 22%) and Victoria (3,905 or 15%). The Northern Territory had the highest imprisonment rate (542 per 100,000 adults), followed by Western Australia (227) and New South Wales (186)(ABS 2006c).

Table 3.9: Characteristics of prisoners at 30 June, selected years

Characteristic	1991	1996	2001	2006
Number	15,021	18,193	22,458	25,790
Total imprisonment rate (per 100,000 adults)	117	132	153	163
Average age (years)	30.3	31.8	33.0	34.7
Aged under 25 (%)	33.0	28.6	25.3	19.7
Females (%)	4.8	5.3	6.7	7.1
Indigenous (%)	14.4	18.0	19.8	23.6
Indigenous imprisonment rate (per 100,000 adults)	1,739	1,436	1,754	2,127
Prior known adult imprisonments (%)	56.9	57.4	58.4	56.9
Remandees (%)	13.2	12.7	19.3	21.6
Median sentence length (years)	n.a.	3.0	3.3	3.0

Source: ABS 2001b; ABS 2006c.

The Indigenous community is particularly affected by imprisonment, making up nearly one-quarter (24%) of the adult prisoner population in 2006 (ABS 2006c). As Table 3.9 shows, Indigenous Australians were 13 times as likely to be imprisoned as their non-Indigenous counterparts in 2006. Western Australia has the highest Indigenous imprisonment rate in Australia at 3,385 per 100,000 in 2006—the highest of any indigenous group in the OECD (Pratt 2006; Tonry 1994). The Northern Territory has the highest proportion of Indigenous prisoners (82% of its prisoner population in 2006) and Victoria the lowest (6%).

Box 3.4: Prisoner health information

The issue of prisoner health has been the subject of considerable interest and activity in recent years. In 2004, a Prisoner Health Information Group was formed with representation from correctional health services, health departments, academia, corrective services, the Australian Bureau of Statistics, and the AIHW. In 2006, this group released a discussion paper entitled *Towards a national prisoner health information system* (AIHW 2006b). The report highlighted the lack of national information on prisoner health and suggested a comprehensive national audit of current information collected on prisoners' health. The audit has now been completed and a collection of health indicators proposed (AIHW: Belcher and Al-Yaman 2007).

Mortality

Concerns in the mid-1980s about the number of Aboriginal people dying while in custody resulted in a Royal Commission to investigate these deaths. Although the commission found that Indigenous people did not die in custody disproportionately to non-Indigenous Australians, it recommended that the Australian Institute of Criminology should routinely monitor deaths in custody (AIC 2006). Over the 16-year post Royal Commission period between 1990 and 2005, a total of 807 inmates died in Australian prisons. Nineteen per cent (152) of all deaths were among Indigenous prisoners. Between 1990 and 2001 the death rate in custody varied between 2 and 6 deaths per 1,000 prisoners (among both Indigenous and non-Indigenous prisoners), then fell after 2001 (Joudo 2006). Suicide accounted for 46% of prison deaths between 1990 and 2005 and 'natural causes' for 38%.

There have been a limited number of studies comparing the mortality of prisoners with the general population. A 1985 report on Victorian prisons found the death rate to be 2.5 times that of the general community (Office of Corrections Victoria 1985). A later study (Thomson & McDonald 1993) found that overall mortality was slightly higher for prisoners than for the general population. However, for suicide, the age-adjusted risk was 2.6 times as high and 5.8 times as high in Indigenous and non-Indigenous prisoners, respectively.

Although deaths during imprisonment were the focus of the 1991 Royal Commission, recent studies have all highlighted higher death rates among former prisoners. Coffey et al. (2003) found that juvenile offenders (median age about 18 years) with a history of imprisonment in Victoria had death rates that were 9 times as high for the young male offenders as those of other young males of the same age, and 41 times as high for young female offenders as those of other young females. Drug-related deaths and suicide were the two leading types of death for young males, and one-quarter of all drug-related deaths among young males aged 15–19 years in Victoria were among young offenders. In another Victorian study, ex-prisoners were 10 times as likely to die from unnatural deaths (for example, accidents, suicide and homicide) than the general population (Graham 2003). A much higher excess mortality rate was again observed among female ex-prisoners compared with males. Most deaths (60%) among released prisoners were due to drug overdose with heroin, usually in combination with some other drug.

Stewart et al. (2004) examined ex-prisoners' deaths in Western Australia between 1994 and 1999 and found that suicide, drug and alcohol dependence, and cardiovascular disease were the most common causes of death. Deaths associated with drugs and alcohol (particularly heroin-related) accounted for 29% of all deaths in the cohort. Both male and female Indigenous ex-prisoners were three times as likely to die as 20–40 year old Indigenous people in the community. However, female non-Indigenous ex-prisoners were the most vulnerable, with a death rate over 100 times that of non-Indigenous Western Australians in the community.

Kariminia et al. (2007a) examined over 85,000 male and female adults imprisoned in New South Wales with 15 years of follow-up (1988–2002). From the 5,137 deaths (303 of which occurred in prison), the overall death rate for males was 4 times that of males in the general community and the corresponding comparison for females was 8 times. Comparative rates were substantially higher for deaths from drug overdose (13 times the community rates for the males and 50 times for the females) and for deaths from alcohol abuse (8 times the general community rate for males and 103 times for females). Heroin was the major contributor to most drug-related deaths. Male and female prisoners had a 10-fold and 26-fold increased risk of homicide respectively. The increased risk of death was much greater after release from prison than during imprisonment in both males and females: for males the risk after release was 4 times as high as in the general community and while in prison it was twice as high; for females the corresponding risks were 8 and 2 times as high. Overall, the risk of death among ex-prisoner Aboriginal males was 5 times and among females 13 times that of the general NSW population.

The researchers also examined suicide in detail and found that males had a higher rate of suicide than females both in prison (a male rate of 129 per 100,000 prisoners per year compared with 56 for females) and following release (correspondingly 135 and 82) (Kariminia et al. 2007b). The 2-week period immediately after release from prison marked an especially heightened risk of suicide in males, being almost 4 times the risk that applied after 6 months. In contrast, no suicides among females were observed in the 2 weeks after release. However, drug-related mortality in males was 9 times as high, and in females was 6 times as high, in the 2 weeks after release compared with 6 months post-release.

Traumatic brain injury

Studies have consistently found high levels of traumatic brain injury (TBI) among prisoner populations, ranging from 22% to 100% of prisoners. (A TBI is caused by a blow or jolt to the head or a penetrating head injury that disrupts the normal function of the brain (NCICP 2007).) This has led to speculation about a causal link between the TBI and the offending behaviour (Slaughter et al. 2003; Templer et al. 1992). Two US studies of death row inmates found that 75% had a history of brain damage and 100% had a history of TBI. Fifty per cent of individuals convicted for non-violent crimes had a history of TBI compared with 5–15% in comparison samples (Sarapata et al. 1998).

A survey of 200 prisoners entering the correctional system in New South Wales found that 82% of those screened reported a history of a TBI, either with or without a loss of consciousness, 65% reported a history of TBI with a loss of consciousness, and 43% reported having had four or more TBIs (Schofield et al. 2006). The median number of TBIs per person was three and they were most commonly caused by assault. TBI was found to be positively associated with playing competitive contact sports, school expulsion, daily drug use, and positive screening for depression or psychosis.

In the NSW study, 52% of those who reported a TBI also reported that they had experienced some effect of the TBI and that the problem was still ongoing. Unresolved brain effects (headache being the most common symptom) were reported by 45% of those reporting a TBI, unresolved psychological effects by 32% (for example, personality change or depression) and social effects by 17% (for example, relationship breakdown).

Young offenders

In 2003, the NSW Department of Juvenile Justice and Justice Health NSW did a wide-ranging survey of the physical and mental health needs of the state's imprisoned young offenders (NSW DJJ 2003). A similar survey was also conducted that year of young offenders serving a (non-custodial) community order (Kenny et al. 2006). (Over 70% of young offenders under the auspices of the NSW Department of Juvenile Justice serve a community order rather than custodial sentence.)

These studies showed that the health problems of young offenders are considerable and span chronic illness, exposure to infectious diseases, and high levels of risky behaviours. Backgrounds showing disadvantage, instability and social exclusion are likely to contribute to this poor health. Many of those surveyed reported parental imprisonment, living away from the family home, being taken into care as a child, and living with a person with a physical or mental disability (Table S18). Over 80% of young people surveyed were not attending school and 9 out of 10 young offenders had been suspended from school at some time in the past.

Overall, 32% of community-based young offenders and 43% of those screened in custody had a mental or behavioural problem according to the Adolescent Psychopathology Scale (Table S19). Substance use disorder and conduct disorder were the two most common diagnoses. Recent symptoms such as sleeping problems, forgetfulness, headaches, and poor appetite were fairly common in this group.

Exposure to bloodborne viruses, particularly hepatitis B and hepatitis C, can occur as a result of risky behaviours such as injecting drug use, sharing contaminated injecting equipment, unsafe tattooing and body piercing. Over 70% of those who tested positive for hepatitis C antibodies had injected drugs at some time in the past (over 50% within the preceding 12 months).

Overwhelmingly, the young offenders screened had engaged in both licit and illicit substance use (Table S20). Over 80% of offenders in the community were current tobacco smokers and the average age at which they had started smoking was 12 years.

3.5 Overseas-born people

Australia has one of the largest proportions of immigrant populations in the world, with an estimated 24% of the total population (4.96 million people) born overseas (ABS 2007c). Well over half (61%) of these—one in seven Australians—were born in a non-English-speaking country.

Migrants bring to Australia their own unique health profiles. Research has found that most migrants enjoy health that is at least as good as, if not better than, that of the Australian-born population. Immigrant populations often have lower death and hospitalisation rates, as well as lower rates of disability and lifestyle-related risk factors (AIHW: Singh & de Looper 2002).

This 'healthy migrant effect' is believed to result from two main factors: a self-selection process which includes people who are willing and economically able to migrate and excludes those who are sick or disabled; and a government selection process which involves certain eligibility criteria based on health, education, language and job skills.

Migrants are often less exposed to harmful risk factors for cardiovascular and other non-communicable diseases in their countries of origin, before their relocation to Australia (Razum 2006). They may retain some of their advantage for such diseases long after migrating. It has been observed, though, that the migrant health advantage often diminishes with length of stay (AIHW 2006c).

Despite these advantages, certain health risk factors and diseases are more common among some country-of-birth groups in Australia, reflecting diverse socioeconomic, cultural and genetic influences.

Health status

Mental health

Significant psychological distress—especially related to war and conflict, but also the disruption of moving and leaving friends and family—has been observed among some migrant groups. These include humanitarian migrants from the Middle East and the Balkans, and migrants who did not speak English on arrival. The ability of migrants to negotiate the resettlement process is a factor which may play a part in their future mental health and wellbeing (Carrington et al. 2007).

Despite this, results from the 2004–05 NHS indicate that overseas-born people who were recent arrivals (4.6% of all people surveyed), or those whose main language spoken at home was other than English (7.9%), were less likely to report mental and behavioural problems than were Australian-born people (8.8%), overseas-born people who arrived before 1996 (9.8%), or overseas-born people who spoke English as their main language at home (10.0%)(ABS 2006a). Overseas-born people are also less likely to be hospitalised for a number of mental disorders, including schizophrenia, depressive episodes and sleep disorders (AIHW 2004).

Hospitalisation

Overseas-born people are admitted to hospital at lower rates than the Australian-born population. In 2005–06, the age-standardised total hospital separation rate for Australian-born patients was 20% higher than for the overseas-born population (367 versus 300 per 1,000 population) (AIHW 2007f). Compared with other country-of-birth groups, those born in North-East Asia—which includes countries such as China, Japan, the Republic of Korea and Taiwan—had the lowest separation rate at 225 per 1,000 population.

Despite this general finding, people from overseas countries are hospitalised at significantly higher rates for a number of health conditions. These conditions, and the countries of birth with higher rates, include:

- tuberculosis—India, Vietnam, Philippines, China
- lung cancer—United Kingdom and Ireland
- diabetes—Greece, India, Italy, Vietnam
- heart attack—India
- heart failure—Italy, Greece, Poland
- dialysis—Greece, Italy, Vietnam, Philippines, Croatia, India.

Consistent with their population numbers, overseas-born patients represented about one-quarter of all hospitalisations in 2005–06. Some 66% of these occurred in public sector hospitals compared with 60% for patients born in Australia. Over 75% of patients born in Fiji, Croatia, Greece, Egypt, Philippines and Vietnam received treatment in a public hospital. The figure for patients born in South Africa, the United States and Hong Kong was less than 50% (AIHW 2007f).

A recent study examining people from refugee backgrounds coming to Victoria found that, over the 6-year study period (1998–99 to 2003–04), their use of hospital services was lower than that of the Australian-born population on a range of measures (overall rates of total hospital admission, surgical admission, total days in hospital, deaths in hospital and admission for mental and behavioural disorders). However, during the study period, rates of total days in hospital and rates of admission for mental and behavioural disorders increased towards Australian-born averages. Furthermore, rates for total admissions, emergency admissions, and admissions for infectious and parasitic disease increased above Australian-born averages (Correa-Velez et al. 2007).

Asthma

People born overseas generally have lower rates of asthma than those born in Australia, especially among those aged under 65 years. Based on the 2004–05 NHS, the prevalence of asthma among people from English-speaking backgrounds compared with non-English-speaking backgrounds was 2.7 times as high in those aged less than 35 years, and 2.4 times as high in those aged 35–64 years. There was no such difference in the prevalence of asthma for people aged 65 years and over (AIHW ACAM 2007). The prevalence of asthma has been shown to increase among migrant populations with the duration of residence (Leung et al. 1994).

Consistent with the differences in asthma prevalence among people aged 5 years and over, the rates of hospitalisation for asthma are higher in people from English-speaking backgrounds than in people from non-English-speaking backgrounds (AIHW ACAM 2005). However, people of non-English-speaking background are more likely to require invasive mechanical ventilation during a hospitalisation for asthma. This ventilation is an intensive care intervention for a severe, life-threatening asthma attack (AIHW ACAM 2005). The higher rate of this procedure among people of non-English-speaking background may reflect more severe disease, delayed initiation of effective treatment for attacks, or both.

For the period 1999–2003, among those with asthma, deaths due to the condition were similar in people of English-speaking and non-English-speaking backgrounds, across all age groups (AIHW ACAM 2005). However, among the Australian population as a whole, older females from non-English-speaking backgrounds had lower death rates due to asthma than older females from English-speaking backgrounds (AIHW ACAM 2005).

Mortality

Death rates for major overseas country-of-birth groups are compared in Table 3.10 with people born in Australia. In the 3-year period 2003–2005, the overall death rate for people born overseas was 9% below that for people born in Australia. But rates varied markedly by country—people born in Vietnam had death rates almost half those of Australian-born people, those born in China had 30% lower rates, and Italy 13% lower. Rates for people born in the United Kingdom and Ireland, along with Germany and the Netherlands, were similar to the Australian-born death rate. Those born in Croatia and Poland had slightly higher rates.

Death rates among people born overseas also varied by cause of death. For many causes the rates were lower than for Australian-born people, lending support to the 'healthy migrant effect'. However, in some cases they were not; compared with the relevant death rate among Australian-born people, the rates were higher for:

- lung cancer among people born in the Netherlands and the United Kingdom and Ireland
- diabetes among people born in Croatia, Greece, India, Italy, Lebanon and Poland
- coronary heart disease among people born in Croatia and Poland
- influenza and pneumonia among people born in the United Kingdom and Ireland.

Table 3.10: Standardised mortality ratios[(a)] by selected causes of death and countries of birth, people aged 15 years or over, 2003–2005

Country of birth	Colorectal cancer	Lung cancer	Diabetes	Coronary heart disease	Cerebro-vascular disease	Influenza & pneumonia	All causes of death[(b)]
China	*0.77	1.03	0.91	*0.51	*0.90	*0.79	***0.69**
Croatia	1.23	1.23	*1.71	*1.14	1.04	1.22	***1.09**
Germany	0.95	1.00	1.14	0.99	1.03	0.81	**1.00**
Greece	*0.74	*0.74	*1.38	*0.78	*0.73	*0.74	***0.77**
India	*0.56	*0.70	*1.55	1.05	*0.85	0.80	***0.83**
Italy	1.02	*0.92	*1.69	*0.84	*0.77	*0.79	***0.87**
Lebanon	*0.73	1.03	*2.05	0.99	0.81	*0.65	***0.89**
Malaysia	*0.60	*0.66	1.30	*0.57	0.86	*0.43	***0.61**
Netherlands	*0.79	*1.36	1.06	0.93	*0.85	0.97	***0.99**
New Zealand	1.11	0.90	0.85	0.96	0.96	0.97	***0.91**
Philippines	*0.47	*0.53	0.79	*0.46	0.95	*0.26	***0.56**
Poland	1.08	1.10	*1.36	*1.21	0.99	1.04	***1.07**
South Africa	*0.63	0.92	0.70	*0.65	*0.81	1.14	***0.81**
UK & Ireland	*0.89	*1.31	*0.88	0.98	*0.93	*1.14	**1.01**
Vietnam	*0.42	*0.63	1.00	*0.32	*0.64	*0.50	***0.52**
All overseas	***0.86**	***1.06**	***1.19**	***0.93**	***0.89**	**0.96**	***0.91**
All deaths	*12,728*	*21,635*	*10,512*	*73,534*	*35,764*	*9,906*	*390,108*

* Statistically significant difference from 1.00 at the 5% level.

(a) The standardised mortality ratio is a measure of death from a specific condition in the overseas-born population relative to the Australian-born population. If the ratio is 1.00 this means the overseas-born would have the same mortality rate as the Australian-born. Ratios greater than 1.00 indicate a greater mortality rate in the overseas-born population, and those below 1.00 indicate a lower mortality rate. Data are age-standardised to the Australian population as at 30 June 2001.

(b) Also includes all other causes of death.

Source: AIHW National Mortality Database.

Health risk factors

The 2004–05 NHS asked questions about a number of lifestyle behaviours and related characteristics which are recognised as risks to health. Referring to the 2 weeks before being surveyed, people from certain country-of-birth groups reported engaging in the following risk-related behaviours more often than people born in Australia (Table 3.11):

- current daily smoking—Other Oceania (includes, for example, New Zealand, Papua New Guinea, Solomon Islands, Kiribati, Fiji, Antarctica)
- sedentary or low exercise levels—Southern and Eastern Europe, North Africa and the Middle East, South-East Asia, All other countries
- consuming less than the recommended five serves of vegetables per day—every other country-of-birth group.

In addition, those from Other Oceania and Southern and Eastern Europe reported body weights and heights showing they are more likely to be overweight or obese than people born in Australia.

In contrast, people born in South-East Asia and 'All other countries' reported less smoking, less drinking at risky levels and lower levels of bodyweight than those born in Australia.

Table 3.11: Selected health risk factors by country of birth group, people aged 18 years and over, 2004–05 (per cent)

Country of birth group	Current daily smoker	Risky/high-risk alcohol	Sedentary/low exercise level	Overweight/obese BMI	1 or fewer serves of fruit	4 or fewer serves of vegetables
Australia	22.3	15.3	69.2	50.1	47.8	84.4
Other Oceania	26.1	12.5	66.8	58.3	44.4	89.2
United Kingdom	18.6	15.5	68.6	51.1	45.6	86.7
Other North-West Europe	18.0	11.8	67.3	50.9	42.0	87.0
Southern & Eastern Europe	18.4	6.0	81.8	59.5	29.4	88.8
North Africa & the Middle East	22.8	2.2	79.5	47.5	40.1	92.2
South-East Asia	15.6	4.4	76.7	29.4	43.5	92.6
All other countries	14.8	4.7	74.4	34.2	44.5	89.6

Source: ABS 2006a.

3.6 Australian Defence Force members and veterans

Australian Defence Force members are a special population group in Australia for many reasons. They are of particular interest from a health perspective because they tend to have better health than those in the general community, they have access to special health services and they are exposed to a wide range of occupational hazards.

Military populations experience a strong 'healthy worker effect'. This occurs because people who are in work are fit enough to work, whereas the general population is composed both of those who are fit enough to work and those who are unable to work because of illness or disability. In addition, members of the Defence Force are selected partly because of their better health and are then required to maintain that health at a level that is generally higher than the rest of the community. This healthy worker effect persists for some time among the veteran population although, by some measures, the health of the veteran community is below that of the general civilian community.

In Australia, 'veteran' is generally applied to those members of the Australian Defence Force who have been deployed overseas, in either a war or a peacekeeping operation. In this chapter the term 'veteran' applies to members of this group.

The Australian Defence Force

As at 31 October 2007, the permanent Australian Defence Force (ADF) had about 51,700 members, 86.7% of whom were male. The average age was 31 years and about 90% of ADF members were aged between 20 and 50 years, 6% were under 20 years and 4% were between 50 and 65 years. In contrast, in 2006 the median age of the Australian workforce was 39 years for males and 38 years for females (ABS 2007d).

Australian citizens seeking to join the ADF undertake a rigorous medical and psychological screening process. At entry, Defence Force members are generally in good health.

Military service has both positive and negative effects on health status. Positive effects arise from the provision of a comprehensive suite of support services to ADF members, including health-care services, the requirement to maintain physical fitness and the supportive nature of military culture. Health-care services for ADF members are outlined in Chapter 7.

However, ADF members often operate in severe and hazardous environments. Their training in preparation for operational tasks can be intense and dangerous. Their work can be physically arduous and may involve operating in remote areas, with variable levels of health support. Deployment also means separation from family, social supports, peer networks and the Australian way of life. All of these factors can potentially harm members' health.

Mortality

Based on data reported to the Department of Defence, in the 7-year period from 2000–01 to 2006–07 there were 234 deaths among full-time ADF personnel. After adjusting for the different age and sex structures of the ADF and the general Australian population, death rates for members of the ADF are significantly lower for overall mortality, cancer, cardiovascular disease, assault and suicide (Table 3.12). This is likely to be partly due to a strong 'healthy worker effect'. The rate of suicide, which is about half of that in the non-military population, is particularly noteworthy.

The rate of death from land transport is similar for defence members and the general community. This is notable because military personnel are highly mobile, often posted far from their families and, anecdotally, spend more of their time (both at work and during leisure hours) driving. In recognition of their mobility, the ADF has a wide range of policies aiming to reduce deaths from land transport crashes.

Table 3.12: Standardised mortality rates (SMR) and 95% confidence intervals (CI) for all full-time ADF members for selected causes of death, 2000–01 to 2006–07

Cause of death	SMR	Lower 95% CI	Upper 95% CI
All causes	0.54	0.47	0.61
All neoplasms (including cancer)	0.50	0.34	0.66
Cardiovascular diseases	0.42	0.26	0.59
Land transport	0.98	0.73	1.23
Air transport	9.55	4.55	14.55
Assault	0.25	0.00	0.59
Suicide	0.60	0.44	0.77

Notes

1. Figures include all deaths, both within and outside Australia, which occurred in the ADF from 1 July 2000 to 30 June 2007, compared with rates of death in Australia.
2. SMRs are the actual number of deaths divided by the expected number of deaths (if the ADF population had the same rates as the Australian population), controlling for age, sex and year of death.
3. Confidence intervals describe a range (interval) of values within which we can be 'confident' that the true value lies, usually because it has a 95% or higher chance of doing so. For example, in this table, there is a 95% or higher chance of the SMR for cardiovascular diseases falling between 0.26 (lower 95% CI) and 0.59 (upper 95% CI).

Source: AIHW analysis of unpublished data from the Australian Defence Force.

The only cause of death that was significantly elevated for ADF personnel was death due to air transport. Based on 14 deaths over the 7-year period, members were nearly 10 times as likely as the general Australian population to die from this cause. This elevated death rate was largely a result of several accidents in recent years, such as the helicopter crash on the Indonesian island of Nias in 2005, in which nine ADF personnel died.

Morbidity

Reasons for attendance at health services provide a broad indication of the health status of individuals. The ADF has an EpiTrack Health Surveillance System which collects data on ADF personnel's first and subsequent attendances at primary health-care facilities. It records the principal reason for attendance and the impact of the diagnosis on the member's ability to work. Other key data collected include days of restricted duty and days off all duty because of disease or injury, hospital admissions, and referrals for further consultations. The health surveillance tool is based on the 10th revision of the International Classification of Diseases (ICD-10-AM).

Based on EpiTrack data from 2005–06, the top five reasons for health service attendance were injuries and musculoskeletal disorders; respiratory tract conditions; skin conditions; symptoms, signs and ill-defined conditions not elsewhere classified; and diseases of the ear, nose and throat. These groups of conditions were also the five most commonly responsible for restricted duty. The five most common groups of conditions responsible for lost work days (sick leave) were injuries and musculoskeletal disorders; respiratory tract conditions; symptoms, signs and ill-defined conditions not elsewhere classified; mental health disorders and stress reaction; and intestinal infectious diseases.

Although the data sources are not directly comparable, it is interesting to note that the top five reasons for primary health-care attendance for ADF personnel differ from those of the general working-age population. For example, based on the 2005–06 BEACH survey of general practitioners, the most common reasons for GP encounters among Australian males aged 25–64 years were hypertension, upper respiratory infection, lipid disorders, back complaints and diabetes (see Section 6.4 for further information).

Injuries

Over the 3-year period 2004–05 to 2006–07, there was an improvement in many measures of occupational health and safety incidents among ADF members (Table 3.13). For example, incidents resulting in incapacity fell from 473 in 2004–05 to 216 in 2005–06, and fell further in 2006–07 to 185 incidents. The number of deaths also fell dramatically in this period, although the decline needs to be viewed cautiously, as several of the deaths in 2004–05 occurred in a single accident. Care also needs to be taken when interpreting data for 2006–07, as a large number of Comcare reportable incidents had yet to be coded.

Table 3.13: Reported incidents among ADF members, 2004–05 to 2006–07, by casualty type[(a)]

	2004–05	2005–06	2006–07
Total incident reports[(b)]	15,173	14,874	15,383
Comcare reportable[(c)]			
Deaths	16[(d)]	2	3[(e)]
Serious personal injury[(f)]	745	733	642
Incapacity[(g)]	473	216	185
Dangerous occurrence[(h)]	5,208	5,331	3,428
Total Comcare	*6,442*	*6,282*	*4,258[(i)]*

(a) Includes incident reports from the Defence Materiel Organisation.

(b) An incident report records an event that causes, or has potential to cause, injury or illness to Defence employees or other people, as a result of a Defence undertaking. This data is not static but is annually adjusted to reflect incident reports received after the end of the financial year. This includes minor injuries.

(c) Comcare reportable incidents are those for which a compensation claim has been or may be made under relevant legislation.

(d) Includes nine deaths attributed to the Sea King accident on the Indonesian island of Nias on 2 April 2005.

(e) Includes two deaths attributed to the Kanimbla Black Hawk incident on 29 November 2006 and one death on MV Talisman.

(f) 'Serious personal injury' is defined as an injury or disease in a person caused by work-related employment for which the person needs to be given emergency treatment by a registered medical practitioner, is treated in hospital as a casualty without being admitted to hospital, or is admitted to hospital.

(g) 'Incapacity' is when an employee is unable to perform work for 30 or more consecutive days or shifts.

(h) A 'dangerous occurrence' is a near-miss event that could have resulted, but did not result, in fatality, serious personal injury or incapacity. This includes exposure to extreme heat or cold.

(i) Does not include any of the 4,731 incident forms yet to be coded. For this reason, data for 2006–07 are considered by the AIHW to be preliminary.

Source: Australian Government Department of Defence 2007.

Veterans

Veterans are a distinct population within the Australian community. In general, they differ from the rest of the community not by the nature of their health conditions, but by the prevalence of those conditions. Their unique health needs, and how they have acquired them, have led to special health-care arrangements that are described in Chapter 7.

In recent years, there has been a change in the profile of Australia's veteran population. This has occurred because of a large decline in the number of World War II veterans, who are now at an age when many are dying. It has also occurred because the current deployments to East Timor, Iraq, Afghanistan, Bougainville and the Solomon Islands have provided substantial new groups of younger veterans. The East Timor deployment of almost 20,000 is now the fourth largest deployment in Australian history, following World War II, World War I and the Vietnam War. The deployment to the Middle East Area of Operations (Afghanistan and Iraq) is now Australia's fifth largest deployment ever. The number of Australians deployed to the various wars or theatres and the latest estimated number of those veterans still alive are outlined in Table 3.14.

Table 3.14: Numbers of Australians in major deployments and estimated survivors

Conflict	Number deployed[(a)]	Estimated survivors[(b)]
Boer War	16,500	0
World War I	416,800	1
World War II	1,118,300	119,600
British Commonwealth Occupation Force (Japan)[(c)]	7,100	2,000
Korean War, Malayan Emergency and Far East Strategic Reserve	28,300	14,300
Vietnam War	60,385	49,700
Gulf War 1990–91[(d)]	1,871	1,800
Solomon Islands	4,089	4,000
Bougainville	4,776	4,700
East Timor[(e)(f)]	19,710	19,700
Iraq and Afghanistan[(f)]	18,425	18,400

(a) Numbers deployed are rounded to 100 except for Gulf War 1990–91, Solomon Islands, Bougainville, East Timor and Iraq and Afghanistan.

(b) Estimated survivors as at 30 June 2008.

(c) Does not include those who also were part of World War II.

(d) Includes Operation Habitat to Kurdish areas of Iraq.

(e) Includes all deployments to East Timor from 1999.

(f) Ongoing deployment.

Sources: For data on conflicts up to and including the Vietnam War, the source is the Department of Veterans' Affairs. The numbers for the deployments to Bougainville, Solomon Islands and East Timor come from a study by the Centre for Military and Veteran Health on the records of the Department of Defence. The numbers for the Gulf War 1990–91 come from the Australian Gulf War Health Study. Department of Defence supplied the data for deployment to Iraq and Afghanistan (as of 31 August 2007).

Special risks for veterans

Veterans have experienced a range of hazards that are either particular to military service or are different from those experienced by the general community in their degree. Exposure to mustard gas, for example, would have occurred almost exclusively among veterans from the World Wars. Noise and stress, although common in civilian society, are likely to be more intense in military life. These factors affect the long-term health of veterans, some aspects of which are discussed below.

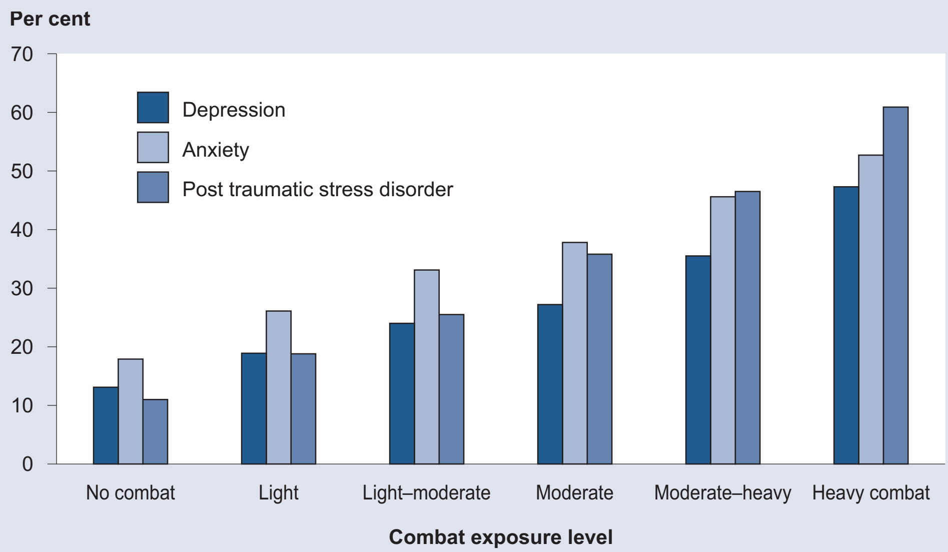
Self-assessed health

A consistent finding is that Australian veterans self-assess their health below that of the general community and also below that of military personnel who have not been deployed to operational areas. A 1996 census of Australia's Vietnam veterans revealed that they are much more likely to rate their health as poor or very poor—a similar finding to that for a sample of Army Vietnam veterans interviewed in 1989–90 (O'Toole et al. 1996). Poor self-assessed health was also found among Korean War and Gulf War veterans (Sim et al. 2005; McKenzie et al. 2004).

Self-assessment of health is important not only as a measure in its own right but also as an indicator of future mortality (Idler & Benyamini 1997). Although it is clear that veterans score poorly on this measure, work has not been done on the time relationship between deployment and lower self-rating.

Mental health

Poor mental health is a major area of disability for veterans, who have both a higher rate of mental health conditions than the general population and a pattern of mental health that is markedly different from the rest of the population. Among Korean War veterans studied in 2004, for example, anxiety state was present in 31%, depression in 24%, and post-traumatic stress disorder in 26%, while 59% drank hazardous amounts of alcohol (Sim et al. 2005). Compared with a population control group, the first three conditions were about six times as prevalent in the Korean War veterans, whereas the various measures of alcohol abuse were between one and a half to three times as common among them (Sim et al. 2005). The prevalence of mental health problems was closely correlated with the degree of combat exposure (Figure 3.8).



Note: The combat exposure level was measured using the Combat Exposure Scale, and the prevalence of the psychiatric conditions was measured using validated instruments.

Source: Ikin et al. 2007.

Figure 3.8: Korean War veterans: prevalence of selected psychiatric diseases by combat exposure level, 2004

In an earlier study of Vietnam veterans, there was a greater level of 'nervousness', 'depression' and 'other mental disease' than in a community comparison group (O'Toole et al. 1996). As with the Korean War veterans, there was a strong and significant correlation between the risk of mental health and the degree of combat exposure.

Similarly, a study of Australian veterans of the Gulf War 1990–91 showed that they had a higher prevalence of a broad range of mental health problems such as depression, anxiety states and post-traumatic stress disorder (Ikin et al. 2005). Again, there was a strong and significant correlation between the risk of developing mental health problems and the degree of exposure to stressors in the Gulf War.

Cancer incidence

By necessity, warfare and its associated activities expose the military to many extra dangers. With the passage of time, some of these exposures have been associated with higher rates of cancer. Exposures that are now implicated include high levels of ultraviolet radiation, asbestos fibre exposure, benzene in military fuels and solvents, and high levels of diesel fuel particulates. There have been several studies of the cancer incidence of various veteran populations. Their findings are not fully consistent and their scope is limited because cancer registration only became universal throughout Australia in 1982. However, they mostly suggest that there are higher levels of cancer in veterans than among the general population.

Cancer incidence in Australia's Korean War veteran population is markedly different from that of comparable Australians. These veterans had significantly higher rates of overall cancer, and cancer of the larynx, head and neck, oesophagus and lung (AIHW 2003b). It is not known whether the elevated rates of cancer are related to levels of smoking and alcohol consumption in this population.

Similarly, a study of cancer incidence among Australia's Vietnam veterans has shown a rate of cancer that is 13–15% higher than that of the general community (Wilson et al. 2005a). This overall elevation was driven by excesses of lung, oral, larynx, pharynx and prostate cancers, and melanoma. However, in this study, there was a significantly lower cancer rate among Vietnam veterans for four cancers (liver, thyroid, multiple myeloma and non-Hodgkin lymphoma). No data are available about smoking or drinking behaviours, or other factors such as post-deployment occupation, that may contribute to these variations in cancer incidence. This study also found that the various branches of service were affected differently. Royal Australian Air Force (RAAF) veterans showed a small excess that was not statistically significant. For veterans in the other two services, the excess cancer incidence was statistically significant (Wilson et al. 2005a).

In contrast, the age-standardised cancer incidence in Gulf War 1990–91 veterans does not differ from that expected in the general population (Sim et al. 2005).

A study of RAAF personnel (including serving members, retired personnel and veterans) involved in maintaining F-111 aircraft provides useful insights into the problems of studying cancer incidence in defence personnel (D'Este et al. 2008). This particular occupational group was identified as having had potential exposure to a range of industrial cancer-causing agents. The study concluded that, on balance, the exposed group was suffering a high rate of cancer. However, the rate of cancer in the two RAAF comparison groups (working on non- F-111 aircraft maintenance at the same and a different base) did not differ from community levels, suggesting that the RAAF population as a whole is not at greater risk of cancer, and that the elevation in risk may be restricted to the relatively small group of people who worked in F-111 maintenance.

Mortality

Mortality is a good measure of the underlying health of populations, but mortality studies of veterans need to be interpreted carefully.

In the past decade, the Australian Government Department of Veterans' Affairs (DVA) has conducted several mortality studies of Australia's service population. These include studies of veterans of the Korean and Vietnam wars and the 1990–91 Gulf War, RAAF personnel involved in aircraft maintenance and a pilot mortality study of the early deployment to East Timor (Sim et al. 2005; Wilson et al. 2005).

These studies reveal a moderately consistent picture, which is similar to that among veterans in other countries. Generally, mortality is lower than expected in the few years after deployment, although there is often a slight elevation in deaths from motor vehicle crashes in those years. With a longer passage of time, however, veteran mortality rates become similar to the general population; and in the case of Korean War veterans, the rates are now significantly higher than those in the general population. There may be two explanations: the first is that the healthy worker effect weakens over time, and the second is that the effects of exposures during service take time to become evident, and more time to affect mortality.

Another notable, and perhaps unexpected, result from the DVA studies concerns suicide. The rate of suicide among Vietnam veterans, for example, is very close to the community average (Wilson et al. 2005b). As is reported elsewhere in this chapter, the rate of suicide among the current members of the ADF is well below that in the general community.

Finally, as with the incidence of cancer, the mortality experience among veterans differs between the various branches of service. In several studies, RAAF personnel (comprising serving members, retired personnel and veterans) have been shown to have mortality rates that are lower than in the general community, and they maintain this advantage for decades after their service. In general, Army personnel lose their relative mortality advantage faster than the RAAF, and members and former members of the Royal Australian Navy faster than either of the other services (Sim et al. 2005; Wilson et al. 2005). The reasons for these differences have not been established.

References

ABS (Australian Bureau of Statistics) 2001a. Australian Standard Geographical Classification. ABS cat. no. 1216.0. Canberra: ABS.

ABS 2001b. Prisoners in Australia. ABS cat. no. 4517.0. Canberra.

ABS 2003. Population characteristics, Aboriginal and Torres Strait Islander Australians, 2001. ABS cat. no. 4713.0. Canberra: ABS.

ABS 2004. National Aboriginal and Torres Strait Islander Social Survey 2002. ABS cat. no. 4714.0. Canberra: ABS.

ABS 2006a. 2004–05 National Health Survey: summary of results, Australia. ABS cat. no. 4364.0. Canberra: ABS.

ABS 2006b. National Aboriginal and Torres Strait Islander Health Survey, 2004–05. ABS cat. no. 4715.0. Canberra: ABS.

ABS 2006c. Prisoners in Australia. ABS cat. no. 4517.0. Canberra.

ABS 2007a. Population distribution, Aboriginal and Torres Strait Islander Australians. ABS cat. no. 4705.0. Canberra: ABS.

ABS 2007b. 2006 Census of Population and Housing: media releases and fact sheets 2006. ABS cat. no. 2914.0.55.002. Canberra: ABS.

ABS 2007c. Migration Australia 2005–06. ABS cat. no. 3412.0. Canberra: ABS.

ABS 2007d. Australian labour market statistics. ABS cat. no. 6105.0. January 2008.

ABS & AIHW (Australian Institute of Health and Welfare) 2005. The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples 2005. ABS cat. no 4704.0; AIHW cat. no. IHW 14. Canberra: ABS & AIHW.

ABS & AIHW 2008. The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples 2008. ABS cat. no 4704.0; AIHW cat. no. IHW 21. Canberra: ABS & AIHW.

AHMAC (Australian Health Ministers' Advisory Council) 2006. Aboriginal and Torres Strait Islander Health Performance Framework report 2006. Canberra: AHMAC.

AIC (Australian Institute of Criminology) 2006. Deaths in custody in Australia 1990–2004. Trends and issues in crime and criminal justice. Canberra: AIC.

AIHW (Australian Institute of Health and Welfare) ACAM (Australian Centre for Asthma Monitoring) 2005. Asthma in Australia 2005. Cat. no. ACM 6. Canberra: AIHW.

AIHW ACAM 2007. Asthma in Australia: findings from the 2004–05 National Health Survey. Cat. no. ACM 10. Canberra: AIHW.

AIHW 2003a. Rural, regional and remote health: information framework and indicators version 1b. Cat. no. PHE 69. Canberra: AIHW

AIHW 2003b. Cancer incidence study 2003: Australian veterans of the Korean War. Cat. no. PHE 48 Canberra: AIHW.

AIHW 2004. Australia's health 2004. Cat. no. AUS 44. Canberra: AIHW.

AIHW 2005a. 2005 National Drug Strategy Household Survey: detailed findings. Cat. no. PHE 66. Canberra: AIHW.

AIHW 2005b. Rural, regional and remote health: indicators of health. Cat. no. PHE 59.

AIHW 2006a. Rural, regional and remote health: mortality trends 1992–2003. Cat. no. PHE 71. Canberra: AIHW.

AIHW 2006b. Towards a national prisoner health information system. Cat. no. PHE 79. Canberra: AIHW.

AIHW 2006c. Australia's health 2006. Cat. no. AUS 73. Canberra: AIHW.

AIHW 2007a. Aboriginal and Torres Strait Islander Health Performance Framework 2006 report: detailed analyses. Cat. no. IHW 20. Canberra: AIHW.

AIHW 2007b: Mental health services in Australia 2004–05. Cat. no. HSE 47. Canberra: AIHW.

AIHW 2007c: Indigenous housing indicators 2005–06. Indigenous Housing series no 2. Cat. no. HOU 168. Canberra: AIHW.

AIHW 2007d: Rural, regional and remote health: study on mortality, 2nd edn, 2002–04. Cat. no. PHE 95. Canberra: AIHW

AIHW 2007e: Cancer in Australia: an overview. Cat. no. CAN 32. AIHW: Canberra.

AIHW 2007f: Australian hospital statistics 2005–06. Cat. no. HSE 50. Canberra: AIHW.

AIHW 2008. Rural, regional and remote health: indicators of health status and determinants. Rural health series no. 9. Cat. no. PHE 97. Canberra: AIHW.

AIHW 2008 forthcoming. Mental health and social and emotional wellbeing of Indigenous Australians. Canberra: AIHW.

AIHW & ABS 2006. Recent developments in the collection of Aboriginal and Torres Strait Islander health and welfare statistics 2005. Cat. no. IHW 15; ABS cat. no. 4704.0.55.001. Canberra: AIHW & ABS.

AIHW: Belcher J & Al-Yaman F 2007. Prisoner health in Australia: contemporary information collection and a way forward. Cat. no. PHE 94. Canberra: AIHW.

AIHW: Mathers C 1996. Health differentials among Australian children. Health monitoring series no. 3. Cat. no. AIHW 338. Canberra: AGPS.

AIHW: Singh M & de Looper M 2002. Australian health inequalities: 1 Birthplace. AIHW Bulletin no. 2. Canberra: AIHW.

Australian Government Department of Defence 2007. Defence annual report 2006–07: volume one. Canberra: Australian Government Department of Defence.

Bhat PN 2002. General growth balance method: a reformulation for populations open to migration. Population Studies 56:23–34.

Brown AF, Ettner SL, Piette J, Weinberger M, Gregg E, Shapiro MF et al. 2004. Socioeconomic position and health among persons with diabetes mellitus: a conceptual framework and review of the literature. Epidemiological Review 26:63–77.

Butler T & Milner L 2003. The 2001 Inmate Health Survey. Sydney: NSW Corrections Health Service.

Butler T, Boonwaat L, Hailstone S, Falconer T, Lems P, Ginley T et al. 2007. The 2004 Australian prison entrants' blood-borne virus and risk behaviour survey. Australian & New Zealand Journal of Public Health 31:44–50.

Carrington K, McIntosh A & Walmsley J (eds) 2007. The social costs and benefits of migration into Australia. Armidale: Centre for Applied Research in Social Sciences, University of New England.

Carson B, Dunbar T, Chenhall R & Bailie R 2007. Social determinants of Indigenous health. Sydney: Allen & Unwin.

Coffey C, Veit F, Wolfe R, Cini E & Patton G 2003. Mortality in young offenders: retrospective cohort study. British Medical Journal 326: 1064–67.

Correa-Velez I, Sundararajan V, Brown K & Gifford SM 2007. Hospital utilisation among people born in refugee-source countries: an analysis of hospital admissions, Victoria, 1998–2004. Medical Journal of Australia 186:577–80.

D'Este C, Attia J, Brown A, Gibson R, Gibberd R, Tavener M, Guest M, Horsley K, Harrex W & Ross J 2008. Cancer incidence and mortality in aircraft maintenance workers. American Journal of Industrial Medicine 51:16–23.

Draper G, Turrell G & Oldenburg B 2004. Health inequalities in Australia: Mortality. Health Inequalities Monitoring Series No. 1. AIHW cat. no. PHE 55. Canberra: Queensland University of Technology and AIHW.

Galobardes B, Lynch J & Davey Smith G 2007. Measuring socioeconomic position in health research. British Medical Bulletin 82: 21–37.

Glover J, Rosman D & Tennant S 2004a. Unpacking analyses relying on area-based data: are the assumptions supportable? International Journal of Health Geographics 3:30.

Glover J, Hetzel D & Tennant S 2004b. The socioeconomic gradient and chronic illness and associated risk factors in Australia. Australia & New Zealand Health Policy 1:8.

Glover J, Tennant S & Page A 2004c. The impact of socioeconomic status and geographic location on Indigenous mortality in Australia, 1997–99. Occasional Paper Series No. 1. Adelaide: Public Health Information Development Unit.

Graham A 2003. Post-prison mortality: unnatural death among people released from Victorian prisons between January 1990 and December 1999. Australian and New Zealand Journal of Criminology 36(1):94–108.

Hertzman C 1999. Population health and human development. In: Keating DP & Hertzman C (eds). Developmental health and the wealth of nations: social, biological and educational dynamics. New York: The Guilford Press, 21–40.

Hetzel D, Page A, Glover J & Tennant S 2004. Inequality in South Australia: key determinants of wellbeing (Volume 1: the evidence). Adelaide: Department of Health, South Australia.

Idler E & Benyamini Y 1997. Self-rated health and mortality: a review of twenty-seven community studies. Journal of Health and Social Behaviour 38(1):21–7.

Ikin J, McKenzie D, Creamer M, McFarlane A, Kelsall H, Glass D, Forbes A, Horsley K, Harrex W & Sim MR 2005. War zone stress without direct combat: the Australian naval experience of the Gulf War. Journal of Traumatic Stress 18(3):193–204.

Ikin J, Sim MR, McKenzie D, Henderson S, Horsley K, Wilson E, Moore M & Harrex W 2007. Anxiety, PTSD and depression in Korean War veterans 50 years after the war. British Journal of Psychiatry 190:475–83.

Joudo J 2006. Deaths in custody in Australia: national deaths in custody program annual report 2005. Technical and background paper no. 21. Canberra: Australian Institute of Criminology.

Kariminia A, Butler T, Corben S, Levy M, Grant L, Kaldor J et al. 2007a. Extreme cause-specific mortality in a cohort of adult prisoners—1988 to 2002: a data-linkage study. International Journal of Epidemiology 36:310–16.

Kariminia A, Law M, Butler T, Levy M, Corben S, Kaldor J et al. 2007b. Suicide risk among recently released prisoners in New South Wales, Australia. Medical Journal of Australia 187:387–90.

Kenny D, Nelson P, Butler T, Lennings C, Allerton M & Champion U 2006. NSW young people on community orders health survey 2003–2006: key findings report. Sydney: University of Sydney.

Krieger N, Williams DR & Moss NE 1997. Measuring social class in US public health research: concepts, methodologies, and guidelines. Annual Review of Public Health 18:341–78.

Krieger N, Chen JT, Coull BA & Selby JV 2005. Lifetime socioeconomic position and twins' health: an analysis of 308 pairs of United States women twins. PLoS Medicine 2(7):645–53.

Leung R, Carlin JB, Burdon JGW & Czarny D 1994. Asthma, allergy and atrophy in Asian immigrants in Melbourne. Medical Journal of Australia 161:418–25.

Marmot MG, Shipley MJ & Rose G 1984. Inequalities in death—specific explanations of a general pattern. Lancet 1(8384):1003–6.

McKenzie D, Ikin J, McFarlane A, Creamer M, Forbes A, Kelsall H, Glass D, Ittak P & Sim MR 2004. Psychological Medicine 34(8):1419–30.

NCICP (National Center for Injury Prevention and Control). What is traumatic brain injury? Viewed 21 November 2007 at <www.cdc.gov/ncipc/tbi>.

NHMRC (National Health and Medical Research Council) 2000. Nutrition in Aboriginal and Torres Strait Islander Peoples, an information paper. Canberra: NHMRC.

NHMRC 2003a. Dietary guidelines for children and adolescents in Australia incorporating the infant feeding guidelines for health workers. Canberra: NHMRC.

NHMRC 2003b. Dietary guidelines for Australian adults. Canberra: NHMRC.

NSW DJJ (NSW Department of Juvenile Justice) and Justice Health NSW 2003. Young People in Custody Health Survey. Key findings report. Sydney: NSW DJJ.

Office of Corrections Victoria 1985. Suicide and other deaths in prison-including Victorian results from the National Deaths in Custody Survey. Office of Corrections information series no.1. Melbourne: Office of Corrections.

O'Toole B, Marshall R, Grayson D, Schureck R, Dobson M, Ffrench M, Pulvertaft B, Meldrum L, Bolton & Vennard J 1996. The Australian Vietnam Veterans Health Study: II. Self-reported health of veterans compared with the Australian population. International Journal of Epidemiology 25(2):319–30.

Page A, Tobias M, Glover J, Wright C, Hetzel D & Fisher E 2006. Australian and New Zealand Atlas of Avoidable Mortality. Adelaide: PHIDU, University of Adelaide.

Pratt J 2006. The dark side of paradise: explaining New Zealand's history of high imprisonment. British Journal of Criminology 46:541–60.

Preston SH & Hill KJ 1980. Estimating the completeness of death registration. Population Studies 34:349–366.

Quesnel-Vallee A 2007. Self rated health: caught in the crossfire of the quest for 'true' health? International Journal of Epidemiology 36:1161–64.

Razum O 2006. Commentary: Of salmon and time travellers—musing on the mystery of migrant mortality. International Journal of Epidemiology 35:919–21.

Sarapata M, Herrman D, Johnson T & Aycock R 1998. The role of head injury in cognitive functioning, emotional adjustment and criminal behaviour. Brain Injury 12:821–42.

Schofield P, Butler T, Hollis S, Smith N, Lee S & Kelso W 2006b. Neuropsychiatric correlates of traumatic brain injury (TBI) among Australian prison entrants. Brain Injury 20:1409–18.

Sim M, Ikin J & McKenzie D 2005. Health study: Australian veterans of the Korean War. Canberra: Department of Veterans' Affairs.

Slaughter B, Fann J & Ehde D 2003. Traumatic brain injury in a county jail population: prevalence, neuropsychological functioning and psychiatric disorders. Brain Injury 17:731–41.

Stewart LM, Henderson CJ, Hobbs MS, Ridout SC & Knuiman MW 2004. Risk of death in prisoners after release from jail. Australian & New Zealand Journal of Public Health 28:32–6.

Templer DI, Kasiraj J, Trent N, Trent A, Hughey B, Keller W et al. 1992. Exploration of head injury without medical attention. Perceptual and Motor Skills 75:195–202.

Thomson NJ & McDonald D 1993. Australian deaths in custody, 1980–1989: relative risks of Aborigines and non-Aborigines. Medical Journal of Australia 159:581–85.

Tonry, M 1994. Racial disproportion in US prisons. In King R & Maguire M (eds). Prisons in context. Oxford: Oxford University Press.

Vos T, Barker B, Stanley L & Lopez A 2007. The burden of disease and injury in Aboriginal and Torres Strait Islander peoples 2003. Brisbane: School of Population Health, University of Queensland.

Wilson E, Horsley K & van der Hoek R 2005a. Cancer incidence in Australian Vietnam Veterans Study 2005. Canberra: Department of Veterans' Affairs.

Wilson E, Horsley K & van der Hoek R 2005b. Australian Vietnam Veterans Mortality Study 2005. Canberra: Department of Veterans' Affairs.

World Organization of Family Doctors 1998. ICPC-2: International Classification of Primary Care. Oxford University Press.

4 Determinants: keys to prevention

Key points

- Tobacco smoking offers the greatest scope for prevention, closely followed by high blood pressure and overweight/obesity.
- Australia's level of smoking continues to fall and is among the lowest for OECD countries, with the daily smoking rate about one in six adults in 2007.
- About 7.4 million adults were overweight in 2004–05, with over a third of those being obese.
- Illicit drug use in Australia is generally declining, including the use of methamphetamine (the drug group that includes 'ice').
- Most Australians have access to good-quality drinking water, although some remote Indigenous communities have no organised water supply.
- Australia leads among OECD countries in vaccinating older people against influenza.
- Unsafe sexual practices continue, reflected in generally increasing rates of sexually transmitted infections.
- Risk factors account for over 30% of Australia's total burden of death, disease and disability.

The previous two chapters describe Australia's overall levels of health and disease, and the variations among selected population groups. The following two chapters discuss important health conditions and health across life stages, and chapters 7 and 8 outline the activities undertaken to improve our health and the resources used. But why do diseases and other health problems occur in the first place, and, importantly, can we prevent them? This chapter helps to answer these questions by providing statistics on health determinants—the factors that determine how likely we are to stay well or become ill or injured.

The framework for this book (Figure 1.1 in Chapter 1) shows determinants as biomedical and genetic factors, health behaviours, socioeconomic factors and environmental factors. These determinants influence health and wellbeing, and can be influenced by interventions and resources applied to them. Public health activities, for example, seek to modify determinants in the individual or population to improve health and wellbeing (see Chapter 7).

The first part of this chapter presents a conceptual framework for health determinants that illustrates how they can relate to and influence each other, along with health and wellbeing. The chapter then presents information on the main determinants of health, their separate and combined impact on the nation's health, and their levels, patterns and trends.

4.1 What are health determinants?

The health of individuals and populations is influenced and determined by many factors acting in various combinations; that is, health is multicausal. A person's health and functioning—the length and quality of the person's life—are seen as the result of the interactions among human biology, lifestyle and environmental (including social) factors, modified by health and other interventions (see Figure 4.1).

Factors such as tobacco smoking or low socioeconomic status increase the risk of ill health and are commonly termed 'risk factors'. Influences such as a high intake of fruit and vegetables are known as 'protective factors', because they reduce the risk of ill health.

Determinants help explain and predict trends in health, and provide insight as to why some groups have better or worse health than others. They are the crux of disease prevention and health promotion.

For almost all risk and protective factors, the associated effect is not 'all or nothing'. For risk factors, rather than there being one point at which risk begins, there is an increasing effect as the exposure increases. For example, each increment in a person's blood pressure above their 'optimal' level is associated with an increase in the risk of stroke. Depending on the risk factor, the increased risk may be uniform as exposure increases, or it may accelerate or diminish at higher thresholds. Although the increasing risk often starts at relatively low levels, the usual practice when monitoring is to focus on the riskier end of the spectrum. There is also value in monitoring moderate risk, however, to assess trends in the wider population.

Determinants can vary in the 'absolute risk' and 'relative risk' they pose. Absolute risk represents the chance of any person developing or having a particular disease or injury over a specified time period. A high relative risk means that those exposed to a risk factor have a markedly higher chance of developing a disease than those not exposed. For example, the chance of a smoker getting lung cancer is at least 10 times that of a non-smoker. Since lung cancer is, unfortunately, common, this means that smoking poses both a high absolute risk and high relative risk.

Determinants can also vary in how modifiable they are, and this is associated with the potential that any risk or protective factor has to contribute to the prevention of future disease or injury. For example, it is demonstrated throughout this report that age is a major risk factor for many conditions, but it is obviously not modifiable. On the other hand, obesity is also a risk factor for many conditions; yet in the vast majority of cases it can be modified in the individual, and therefore it features in current disease prevention activities.

In addition to influencing the occurrence of new cases of disease or injury, determinants can affect how a disease might worsen or improve, or the nature and extent of complications. The use of health-care interventions can also be regarded as a determinant in that context (see Chapter 7).

As part of their various effects on health, determinants can also influence how individuals function in terms of their activities and participation in society.

A framework for determinants

Determinants are often described as a web of causes, but they can also be thought of as part of broad causal 'pathways' or 'chains' that affect health. Figure 4.1 presents a conceptual framework that illustrates some of the complexity involved. It divides determinants into four broad groups whose main direction of influence goes from left to right—that is, from the 'upstream' background factors (such as culture and affluence) through to more immediate or direct influences (such as blood pressure).

The figure shows how one main group—the broad features of society and environmental factors—can determine the nature of another main group; that is, people's socioeconomic characteristics such as their level of education and employment. Both these main groups also influence people's health behaviours, their psychological state, and factors relating to safety. These in turn can influence biomedical factors, such as body weight and glucose metabolism, which may have health effects through various further pathways.

At all stages along the path these various factors interact with an individual's genetic composition. In addition, the factors within a box often interact and are closely related to each other.

Despite the general direction of these influences, they can occur in reverse. For example, an individual's health can also influence physical activity levels, employment status and wealth.

Five of these clusters of determinants are described in the major sections of this chapter. A summary of the remaining four, with some related statistics, follows here.

Broad features of society

The broad features of society affect the whole population to some extent, combining to influence the basic levels of security, safety, hygiene, nourishment, technology, information, freedom and morale of societies. These broad features set the background level around which variations then occur among groups and individuals. Despite their widespread influence, it is difficult to quantify most of these broad factors, and their impact cannot be precisely assessed.

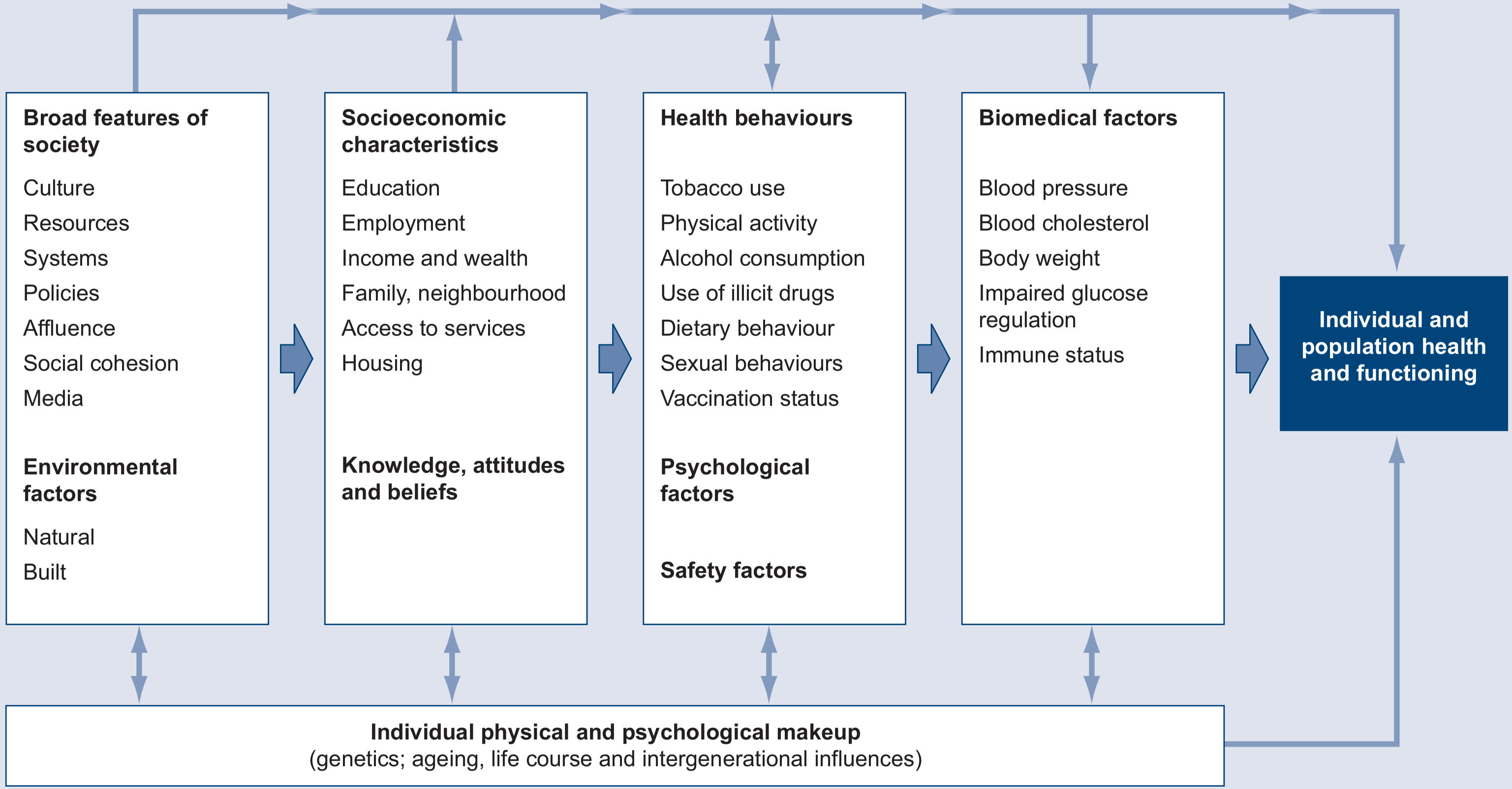
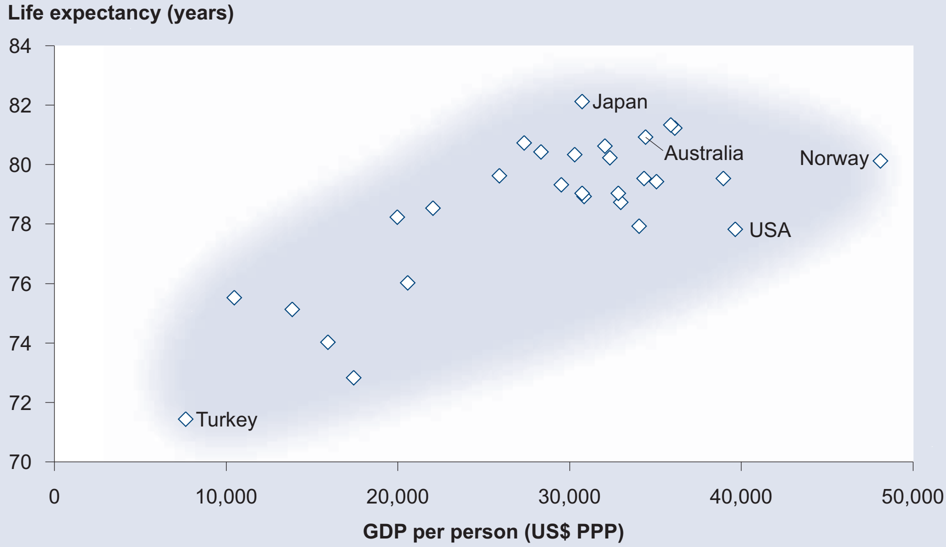


Figure 4.1: A conceptual framework for determinants of health

Included in these general background factors are affluence and social cohesion. The general wealth of a country, or its affluence, tends to be correlated with the health of its inhabitants. For example, among OECD countries in 2005–06 there was a generally positive relationship between per person gross domestic product and overall life expectancy at birth (Figure 4.2).



Notes

1. Excludes Luxembourg.
2. GDP per person (US$ PPP) is the gross domestic product expressed as purchasing power parity in US currency.

Source: OECD 2007.

Figure 4.2: Relationship between per person gross domestic product and life expectancy at birth, OECD countries, 2005–06

Social cohesion refers to the connections and relations among individuals, groups and associations in society. It is reflected in the levels of social and civic trust, the degree of community and civic engagement, and the extent to which people access social and support networks. For example, the Australia Bureau of Statistics (ABS) estimates that in 2006 just over half (54%) of adult Australians felt that 'most people can be trusted' (ABS 2007a). In terms of community engagement, 34% of adult Australians had been engaged in voluntary work in the previous 12 months. Another measure of community engagement is donating: in 2006, around three-quarters of adults had donated money to non-profit organisations (ABS 2007a).

Psychological factors

A person's psychological state and behaviour clearly affect each other and both can in turn lead to biomedical changes or disease. Diseases such as asthma, for example, are believed to be often influenced by psychological factors (AIHW: Australian Centre for Asthma Monitoring 2003). There is also evidence suggesting that depression, social isolation and a lack of quality social support can directly lead to problems such as heart disease, independent of any intermediary behavioural effects such as smoking or poor diet (Bunker et al. 2003).

Safety factors

Safety factors arise from aspects of the built and natural environment (for example, road and traffic conditions), personal behaviours (such as wearing of seatbelts), and policies (for example, regulations about product safety). They are in turn influenced by other determinants such as education, knowledge and attitudes. Safety factors are reflected in perceptions of harm and in actual harm.

In 2005, most adult Australians (95% of men and 83% of women) felt safe if alone in their own home at night (ABS 2006a). However, an estimated 6.2% of households experienced at least one household crime in the 12 months before the 2005 National Crime and Safety Survey, and an estimated 841,500 people aged 15 years and over were victims of at least one personal crime (ABS 2006b).

Individual makeup

Determinants act on and are influenced by an individual's physical and psychological makeup, which can greatly modify a person's response to other new or continuing determinants. This makeup can be seen as the complex product of a person's genes, their ageing, and physical or social influences at various stages over their life course. These factors can be built into a person's makeup for various periods, or for life. Some diseases, such as muscular dystrophy, result entirely from a person's genetic features, whereas most others reflect the interaction between those features and the many other influences mentioned here.

How much of the burden of disease is due to health determinants?

Later in this chapter, information is presented for specific determinants. The population health impact of individual risk factors varies, depending not only on their prevalence in the population, but also on their relative effects in contributing to disease and death. The disability adjusted life year (DALY) measure provides a means of directly comparing the effects of each determinant, because it deals with disability and death on the same terms, hence assessing the total contribution to the burden of disease (see also Chapter 2). In a major study (Begg et al. 2007) this method was applied to attribute burden to 14 risk factors in Australia. It estimated that tobacco smoking caused the greatest burden of disease among these risk factors in 2003, followed by high blood pressure and overweight/obesity (Table 4.1).

However, the total contribution of the studied determinants is not simply the sum of the individual contributions, because they can occur together in the same person, they can occur in various combinations, and they are known to interact. To take this overlap into account, their 'joint effects' were analysed. This resulted in an estimate that 32% of the total burden of disease was due to the studied determinants (Begg et al. 2007).

Table 4.1: Proportion of total disease burden attributed to determinants of health, 2003 (per cent)

Determinant	Males	Females	Persons
Tobacco smoking	9.6	5.8	7.8
High blood pressure	7.8	7.3	7.6
Overweight/obesity	7.7	7.3	7.5
Physical inactivity	6.4	6.8	6.6
High blood cholesterol	6.6	5.8	6.2
Alcohol			
Harmful effects	4.9	1.6	3.3
Beneficial effects	–1.1	–0.9	–1.0
Net effects	3.8	0.7	2.3
Low fruit/vegetable consumption	2.7	1.5	2.1
Illicit drugs	2.7	1.2	2.0
Occupational exposures	2.6	1.3	2.0
Intimate partner violence	n.a.	2.3	1.1
Child sexual abuse	0.3	1.5	0.9
Urban air pollution[(a)]	0.8	0.7	0.7
Unsafe sex	0.5	0.7	0.6
Osteoporosis	<0.1	0.3	0.2
Joint effect[(b)]	**35.1**	**29.1**	**32.2**

n.a. Not available.

(a) Estimate for long-term exposure; an additional 0.3% is attributable to short-term exposure.

(b) Estimate of the joint effect of all studied determinants, taking into account the overlapping effect among determinants on causal pathways.

Source: Begg et al. 2007.

4.2 Environmental factors

Environmental factors include many physical, chemical and biological conditions and agents that may affect human health, both positively and negatively.

Clean air, water and food, and safe human-made environments benefit the health and wellbeing of individuals and communities. On the other hand, the natural environment and natural disasters can be harmful, as can human-caused changes such as poor urban design, land degradation, freshwater depletion and climate change.

Environmental influences on health can be direct or indirect, obvious or subtle, straightforward or complex, and immediate or delayed. Hence it is challenging to assess the full scope and size of the harmful effects that the environment can have on health. These effects include:

- diseases due to microbial contamination of food or water
- vectorborne diseases transmitted by insects such as mosquitoes
- respiratory and heart diseases due to air pollution and to chemicals in workplaces

- other consequences of chemical toxicity
- damage from noise and heat
- injuries due to poorly designed home or workplace environments or traffic systems
- effects on ecological systems (and consequently human health) associated with climate change.

Of these various effects, only urban air pollution is included in the burden of disease analysis described above, mainly because of the complexities and uncertainties in applying that type of analysis to environmental factors.

The following sections present information on selected natural and human-made environmental factors.

Food quality

Foodborne illness is a considerable burden on Australian society, costing an estimated $1.2 billion dollars annually (Abelson 2006). Contamination of food anywhere in the food chain from ‘paddock to plate’ can lead to foodborne illness. An estimated 4–7 million cases of foodborne infection (gastroenteritis) occur annually in Australia (Hall et al. 2005), and foodborne infectious illnesses other than gastroenteritis can also occur. Although various pesticides and other non-natural contaminants can also be found in some foods, studies have consistently shown that Australian dietary exposures to pesticide residues and contaminants are well below Australian or international reference health standards and do not represent a major public health and safety risk (FSANZ 2005).

Poor hygiene and temperature control, as well as contamination at any point in the chain of food production or consumption, can potentially lead to illness. Preventing foodborne illness relies on a complex system of regulation, increasingly based on assessing risks associated with food businesses. Food safety also depends on kitchen hygiene levels, including in households.

Foodborne infections

Foodborne pathogens that commonly cause gastroenteritis in Australia include the bacteria *Campylobacter* and *Salmonella*, and viruses such as noroviruses. Sometimes the illness is part of a recognised ‘outbreak’, with a known or unknown food source responsible for infecting a number of people. In 2006, there were 115 foodborne disease outbreaks recorded in Australia (Table 4.2). These outbreaks affected 1,522 people, 146 of whom were hospitalised; there were no recorded deaths from foodborne disease in 2006 (OzFoodNet 2007).

Table 4.2: Foodborne disease outbreaks, number of outbreaks and persons affected, 2006

Agent category	Number of outbreaks	Persons affected	Average outbreak size (persons)	Hospitalised	Deaths
Campylobacter sp.	4	67	17	4	—
Ciguatera	7	30	4	8	—
Clostridium perfringens	6	199	33	—	—
Hepatitis A	1	10	10	1	—
Histamine poisoning	4	12	3	7	—
Norovirus	11	369	34	4	—
Salmonella typhimurium	25	258	10	76	—
Salmonella other	16	209	13	31	—
Staphylococcus aureus	1	3	3	—	—
Sodium nitrite	1	6	6	6	—
Vibrio cholerae	1	3	3	2	—
Unknown	37	342	9	7	—
Total	115	1,522	13	146	—

Source: OzFoodNet 2007.

Data from the OzFoodNet outbreak register indicate that fish was the food most commonly associated with outbreaks in 2006. Poultry and mixed meat dishes as well as eggs and water were also implicated as the cause in a number of outbreaks. Increasingly, fresh produce is being implicated as the cause of outbreaks, particularly salads, fruit juice, and sprouts (Dalton et al. 2004).

In Australia, notification rates for potentially foodborne infections have increased over recent decades. This is partly because of more complete reporting and improved laboratory capacity to identify pathogens, but is probably also due to changed behaviours—people are eating more takeaway and pre-prepared meals that may pose higher risks if not well prepared. Australia has well-regulated hygiene standards in the food production industry, but the increased scale of production, processing and distribution in recent decades has increased the potential for widespread outbreaks of foodborne infection (Kirk et al. 2004).

Air pollution

Many human activities pollute the outdoor air with potentially harmful substances. Notable examples are motor vehicle transport, mining, energy production and agriculture. Indoor pollution arises from activities such as cooking, heating and tobacco smoking, as well as from harmful odours and micro-organisms. Environmental events such as bushfires are also significant contributors to air pollution.

The health effects of air pollution range from mild and temporary respiratory symptoms through to asthma, cardiovascular conditions, chronic lung disease, and premature death (Table 4.3). Air pollutants are particularly harmful to the very young, the elderly, and people with chronic respiratory or cardiovascular diseases.

By international standards the quality of air in Australia is good (Manins et al. 2001). However, long-term exposure to air pollution is estimated to account for 0.7% of the total burden of disease and injury in Australia (Begg et al. 2007). Pollution from motor vehicles alone has been estimated to account for up to 4,500 cases of respiratory and cardiovascular disease and up to 2,000 premature deaths annually (BTRE 2005).

Table 4.3: Sources and health effects of major air pollutants

Pollutant	Sources	Health effects
Particulate matter	Motor vehicles, wood burning, power plants, bushfires, construction, wind-blown dust, tobacco smoke	Aggravates respiratory diseases; irritates upper airways and eyes; increases risk of death from chronic respiratory and cardiovascular diseases
Ozone	Volatile organic compounds and nitrogen oxides in the presence of sunlight	Aggravates respiratory diseases; decreases lung function; irritates airways
Carbon monoxide	Motor vehicles, wood burning, tobacco smoke	Aggravates cardiovascular disease; affects mental function
Nitrogen dioxide	Motor vehicles, power plants, industry, gas heaters, gas stoves, tobacco smoke	Aggravates respiratory diseases; decreases resistance to infection
Sulphur dioxide	Power plants, tobacco smoke	Aggravates respiratory diseases; irritates eyes and throat; can damage lungs
Lead	Leaded petrol (before 2001), lead smelters, tobacco smoke	Affects neurological developmental in children; can damage nervous system

Sources: BTRE 2005; DEH 2004; Katsouyanni 2003.

Australia's Environment Protection and Heritage Council has set National Environment Protection Measures (NEPMs) for particulate matter (inhalable particles with diameters of up to 10 microns (PM10) or less than 2.5 microns (PM2.5)), carbon monoxide, nitrogen dioxide, sulphur dioxide, ozone and lead. Levels of these pollutants are regularly measured at several sites around Australia and reported in terms of the number of days per year when the average concentration exceeds the NEPM standard. Ozone is measured as an indicator of the amount of photochemical smog (as opposed to stratospheric ozone that protects us from excessive ultraviolet light). It is not a directly emitted pollutant but is formed in a reaction between volatile organic compounds and nitrogen oxides under sunlight.

Of the major air pollutants, current levels of ozone and particulate matter are of most concern and require continual monitoring. The number of days per year in which the concentration of PM_{10} exceeded the NEPM standard level of 50 micrograms per cubic metre was generally higher in Sydney and Melbourne than in the other major capital cities during the period 2001–2005 (Table 4.4). Perth was the only city which did not exceed the maximum allowable 5 days per year of excessive PM_{10}. Ozone concentrations exceeding 0.10 parts per million were more frequent in Sydney than in the other major capital cities. During this period, Adelaide and Perth were the only cities that did not exceed the maximum allowable 1 day per year of excessive ozone; no obvious trend of increase or decrease in ozone levels occurred for any of the capital cities.

Table 4.4: Days exceeding the ambient air quality NEPM standard levels for PM_{10} and ozone, major capital cities, 2001–2005

Measure/location	2001	2002	2003	2004	2005
Number of days when concentration of PM_{10} exceeded 50 µg/m^3 (over 24 hours)[(a)]					
Sydney	5	17	10	2	2
Melbourne	2	6	13	11	9
Brisbane	1	7	2	2	2
Perth	1	2	1	1	3
Adelaide	—	1	6	4	6
Number of days when concentration of ozone exceeded 0.10 ppm (over 1 hour)[(b)]					
Sydney	9	2	4	7	6
Melbourne	—	—	2	1	—
Brisbane	—	2	—	—	—
Perth	—	—	—	1	—
Adelaide	—	—	—	—	—

(a) The maximum allowable number of days exceeding this level (50 micrograms per cubic metre) is 5 days per year, to be achieved by 2008.

(b) The maximum allowable number of days exceeding this level (0.10 parts per million) is 1 day per year, to be achieved by 2008.

Note: Numbers are based on the monitoring site with the most number of days exceeding the standard.

Sources: Environmental Protection and Heritage Council 2007.

Compared with outside air pollution, indoor air pollution is not well monitored, even though most Australians spend the vast majority of the time indoors. Indoor air pollutants include combustion by-products (especially nitrogen dioxide and particulate matter), volatile organic compounds, tobacco smoke, fibres and biologicals (for example dust mites, pet dander, moulds). Many factors influence the levels of indoor air pollution, including the building's location, design, constituent and content materials, and the number and activities of its inhabitants. Other factors, such as lifestyle, climate, ventilation and proximity to pollution sources will influence the amount of pollution entering the building from outside.

Water quality and supply

Access to a safe and adequate supply of water is a fundamental requirement for good personal and public health. This includes both drinking and recreational waters. As the term implies, 'drinking water' is water that is intended for human consumption; but in practice it also includes water used for other domestic purposes such as washing, since the source is usually the same. Recreational waters include swimming pools, lakes, rivers and so forth.

Drinking and recreational waters in Australia are generally of a very high standard. Contamination is rare, especially in and around major population centres. In addition, the fluoridation of tap water delivers public health benefits by reducing the incidence of dental caries (Box 4.1). However, the potential for harm caused by various chemicals and micro-organisms in the water requires constant surveillance and monitoring. There is also growing pressure on the availability of fresh water supplies in some regions, particularly in times of drought.

Box 4.1: Populations with access to fluoridated drinking water

Adjusting fluoride in drinking water to an optimal level is the most effective public health measure for preventing dental decay. In Australia, the optimal range for fluoridated drinking water is between 0.7 parts per million and 1.1 parts per million. Darwin has adopted 0.6 parts per million because of its climate and associated difference in water consumption patterns. Almost 70% of Australians live in areas where the public water supply meets these requirements (*NHPC indicator 2.02*). High percentages in most states and territories reflect the fact that their capital cities are fluoridated. The exception is Queensland, where Brisbane and most regional centres are presently not fluoridated. Nevertheless, compared with other OECD countries, Australia rates highly in the proportion of population with access to fluoridated drinking water and in preventing dental caries.

Sources: Armfield 2006; NHPC 2004.

Access to fluoridated drinking water, 2001

State/territory	Per cent of population[(a)]
NSW	89.8
Vic	75.3
Qld	4.7
WA	90.1
SA	82.6
Tas	94.7
ACT	100.0
NT	84.2

(a) Percentage of state/territory population in 2001 living in areas with optimal levels of fluoride in public water supplies. Optimal fluoride levels from natural or engineering sources are at concentrations of 0.7 parts per million or more, except for the Northern Territory where the optimal concentration is 0.6 parts per million or more.

Water quality

Safe water quality depends on controlling the concentrations of potentially harmful chemical and microbial contaminants. Drinking or bathing in contaminated water can result in health effects ranging from irritated eyes, skin and throat, to mild gastroenteritis, to more severe diarrhoea and potentially life-threatening dysentery, hepatitis and cholera. Some chemical contaminants are suspected of causing cancer.

Numerous chemicals (such as lead, copper, cyanide, arsenic, nitrate and fluoride) may contaminate water as a result of natural processes and the corrosion of pipes and fittings. Chemical contamination may also occur from human activities involving, for example, agricultural herbicides, pesticides, and disinfection by-products (especially chlorine).

In some parts of Australia, drinking and recreational water quality may be affected by cyanobacterial (blue-green algae) blooms and their toxins, resulting from increased nutrient levels, warm water temperatures and reduced water flows.

A broad range of viruses (for example adenovirus, hepatitis viruses, and rotaviruses), bacteria (for example *E. Coli*, *Enterococci*, *Campylobacter* and *Salmonella*) and protozoa (for example *Cryptosporidium* and *Giardia*) can be transmitted by contaminated water supplies. The presence of harmful microbes in drinking water is due mainly to contamination by human or animal faeces. The quality of natural recreational water bodies may be affected by discharges of sewage, stormwater and agricultural runoff; risks to swimming pool water quality arise from microbial contaminants originating from bathers themselves.

The 2004 Australian Drinking Water Guidelines encourage the adoption of standards that emphasise a multibarrier approach within a ‘catchment-to-tap’ risk assessment framework (NHMRC & NRMMC 2004). Barriers may include protection of source waters, prolonged storage to reduce contaminant levels, filtration and disinfection, and maintaining the physical integrity of the distribution system. These guidelines are voluntary but have been adopted by several jurisdictions, which periodically report the results of monitoring.

Almost universally in Australia, water supplies meet the standards for chemical contamination and for key microbes (*E. Coli*, *Cryptosporidium* and *Giardia*). In 2005–06, all major water utilities supplying water to capital cities reported full compliance with microbiological and chemical contamination standards (Water Services Association of Australia 2007). Very high levels of compliance are observed in other regions as well. For example, safe levels of *E. Coli*—which are often used as an indicator for faecal contamination—were met by over 95% of water localities in Victoria in 2005–06 (Victorian Department of Human Services 2007).

Most Australians have access to good-quality drinking water, and disease outbreaks from public water supplies are rare. However, the 2006 Community Housing and Infrastructure Needs Survey found that 9 of the 1,187 discrete Indigenous communities surveyed had no organised water supply, compared with 21 communities in 2001 (ABS 2002, 2007b); 8 of these 9 communities were in Very Remote areas. Out of 164 Indigenous communities not connected to a town water supply and which had their water tested, 48 (with a combined population of about 12,000 people) had drinking water that failed testing (ABS 2007b). Also, recreational water activities, particularly in coastal regions, have been linked to incidences of intestinal, respiratory, skin, ear and eye conditions (Queensland Health 2001). Public swimming pools have been the source of a small number of outbreaks of cryptosporidiosis in recent years.

Besides drinking and recreational water, waterborne diseases can be spread through inhalation, food ingestion, and person-to-person contact. This makes it difficult to attribute drinking or recreational water as the source of an illness, particularly when symptoms tend to be similar and when there is a lag between initial exposure and illness. For example, swimming in contaminated water is likely to be responsible for over 50% of cases of cryptosporidiosis reported over the summer (NSW Health 2006); but various other modes of transmission are also possible, and many of the cases notified through the National Notifiable Diseases Surveillance System (3,209 reported in 2005) are likely to be caused by person-to-person contact.

Water supply

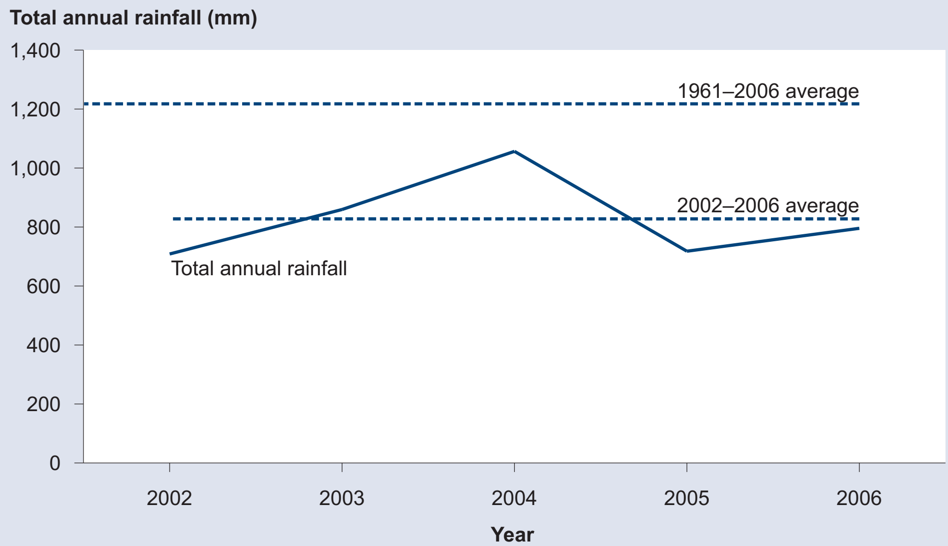
Less than 10% of the fresh water consumed in Australia is for domestic purposes, the rest being for agriculture, commerce and industry (Beeton et al. 2006).

About 93% of Australian households are connected to mains water supplies, and over 80% use mains water as their primary source of drinking water. Other important sources of drinking water are rainwater tanks (11% of households), particularly in rural areas, and bottled water (8% of households) (ABS 2005).

Droughts affect the water supply of major population centres to various extents. For example, Darwin's average total annual rainfall for the 5 years between 2002 and 2006 was just under 5% less than the average between 1961 and 1990. In contrast, Brisbane's rainfall over the same period was 32% down from the long-term average (Figure 4.3), resulting in Brisbane's water storage capacity dropping steadily from 64% in early 2004 to 17% in mid-2007; but more recent rainfall along with tight water restrictions saw dam levels restored to around 33% in early 2008 (SEQWater 2008).

Although short-term averages can vary greatly and should be treated with caution, such dramatic short-term declines, combined with growing populations, have led to low dam and reservoir levels and the introduction of water restrictions in many areas.

With concerns that pressures on the drinking water supply will continue to grow, supplementary supplies, such as recycling and desalination, have been proposed by several jurisdictions.



Source: Bureau of Meteorology 2007.

Figure 4.3: Annual rainfall in Brisbane, 2002–2006

Environmental changes, climate and health

Illness and death associated with environmental hazards such as extreme temperature, natural disasters, famine, poor air and water quality, and vectorborne diseases are much less common in Australia than in developing countries. This is largely because resource-rich communities usually adapt to environmental hazards despite the increasing pressure those same communities place on environmental systems in the pursuit of modern living. However, there are growing concerns that large-scale changes to the environment will expose Australians to a range of unfamiliar or amplified hazards. This may be of particular concern for vulnerable groups, such as Indigenous Australians and the elderly.

It is widely recognised that human activities are having an increasing impact on many environmental systems, including the global climate system (IPCC 2007a; Reid et al. 2005). Corvalan et al. (2005) note that environmental changes that may directly or indirectly affect human health and wellbeing include:

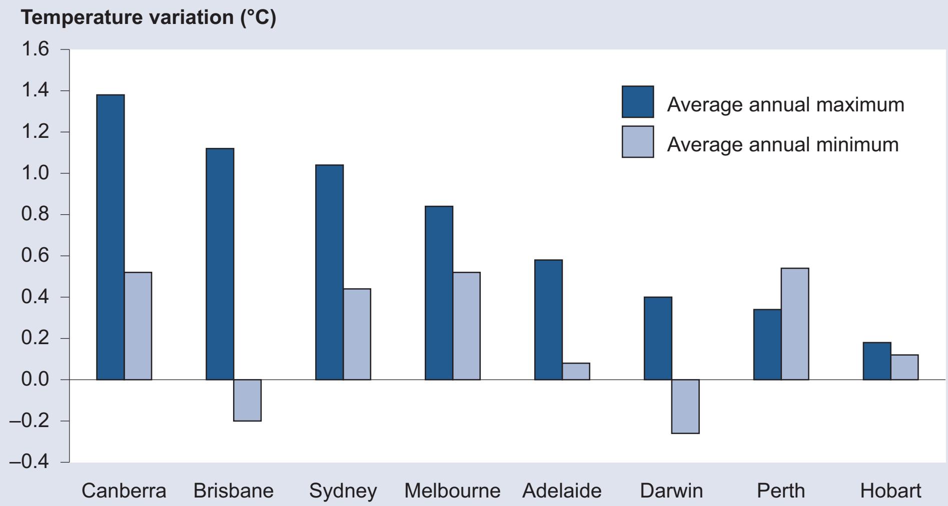
- depletion of stratospheric ozone
- deforestation
- land degradation

- loss and damage to wetlands
- loss of biodiversity
- depletion and contamination of fresh water
- urbanisation.

Some of these changes may be experienced at a local level and have local impacts. Others are likely to have global and long-term impacts, and most are interrelated and may influence or be influenced by climate change.

Climate change

In 2007, Working Group 1 of the Intergovernmental Panel on Climate Change stated that 'warming of the climate system is unequivocal' (IPCC 2007a). Since 1900, there has been a 0.7–0.8° Celsius rise in the global annual average temperature, with the annual average temperature in Australia rising by about 0.9 °Celsius since 1910 (Bureau of Meteorology 2007) (Figure 4.4). The year 2005 was the warmest in Australia since reliable records began in 1910 (Bureau of Meteorology 2006).



Source: Bureau of Meteorology 2007.

Note: Columns represent the difference in average annual maximum/minimum temperatures for the period 2002–2006 compared with the period 1961–1990. For example, the average annual maximum temperature for Canberra in the period 2002–2006 was nearly 1.4 °C warmer than the average in the period 1961–1990.

Figure 4.4: Average temperatures in capital cities: 2002–2006 compared with 1961–1990

Rising temperatures worldwide ('global warming') are expected to affect other aspects of the global climate by altering wind patterns, sea levels, and the frequency and/or intensity of extreme weather events such as heatwaves, droughts, floods and tropical storms (IPCC 2007a).

Although some effects of climate change and other environmental changes may be beneficial (such as increased crop yields or displacement of disease-carrying animals and insects in some areas), most are expected to be harmful, and are further discussed below.

Health effects of climate change

In general, it is difficult to measure or forecast with any precision how environmental conditions or hazards affect human health. The links often involve indirect and complex relationships and effects that are often delayed or displaced (Corvalan et al. 2005; Preston & Jones 2006). This is particularly true of health effects caused by or associated with large-scale and complex environmental changes, including climate change. However, recent research provides some idea of the effects of changes to the climate and environment on human health and wellbeing.

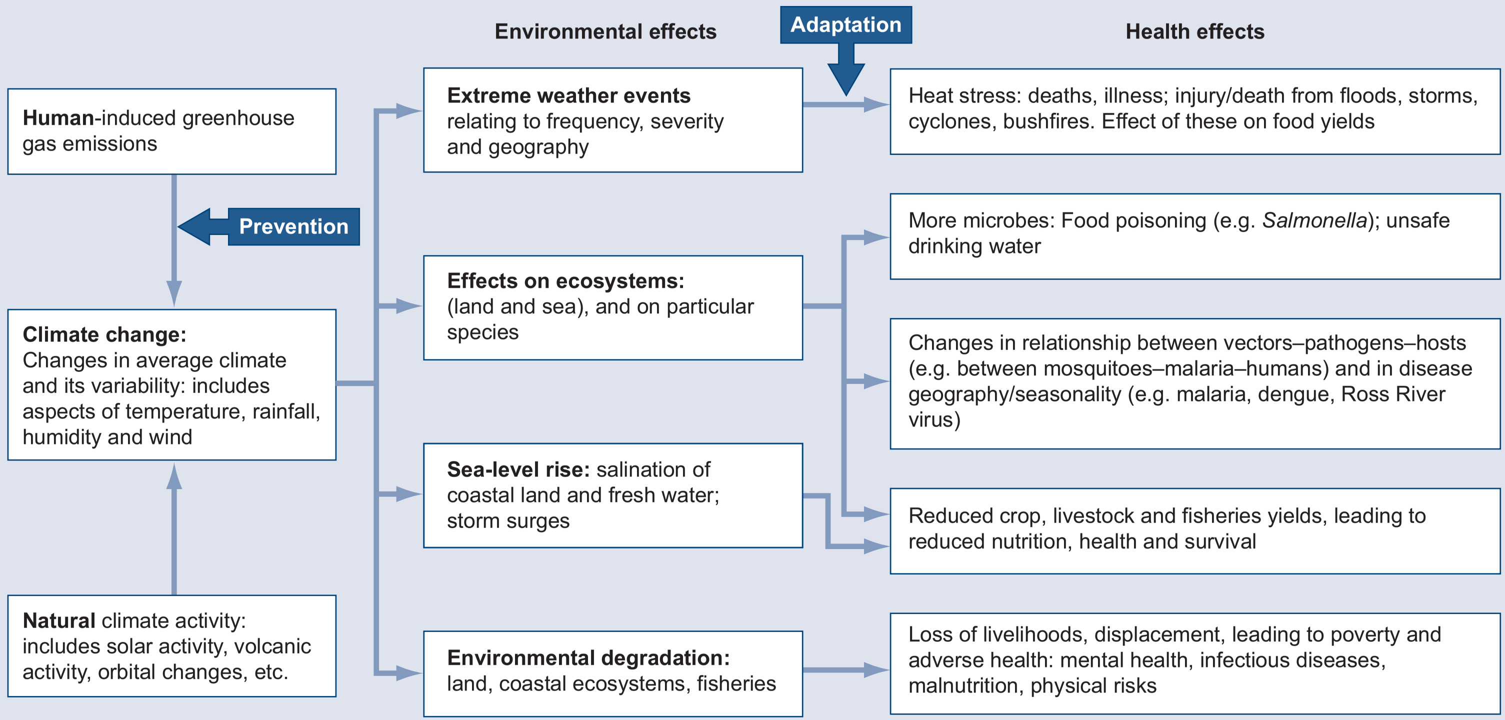
Direct risks to health from climate change and other environmental changes include those from heatwaves, bushfires, severe storms, floods and landslides (Corvalan et al. 2005; IPCC 2007b; McMichael et al. 2006; Preston & Jones 2006). Indirect effects from damaged or overstressed environmental systems may include increased exposure to ultraviolet light, air pollutants, airborne allergens and contaminated food and water. Other indirect effects include malnutrition among some groups (because of reduced availability or increased cost of some foods, such as vegetables and fish) and mental health problems arising from loss of livelihood, especially among rural workers (Corvalan et al. 2005; McMichael et al. 2006).

Climate change and other environmental changes may also affect health and wellbeing through population displacement (for example, immigration from badly-affected regions), and loss of sources of natural medicines (Corvalan et al. 2005; McMichael et al. 2006).

Infectious diseases may become more common in Australia because of changes in populations and distribution of pathogens, disease vectors, and non-human hosts. Epidemic polyarthritis is the most common vectorborne disease in Australia and is caused by infection by Ross River virus (2,544 reported cases in 2005) or Barmah Forest virus (1,319 reported cases in 2005). Increases in populations of mosquito species that transmit these and other diseases, such as encephalitis and dengue fever, are influenced by climatic factors, including temperature, rainfall, humidity and high tides (Peng & Parton 2003, Peng et al. 2004). Although it is difficult to predict accurately how the prevalence or distribution of vectorborne diseases will be affected by climate change, several models suggest that mosquitoes, if not controlled, will probably spread some of these diseases more widely (Woodruff et al. 2005).

Figure 4.5 summarises the main pathways by which climate change can affect population health, and suggests that interventions (shown as 'adaptation' in the figure) can reduce health damage.

To date there is no systematic attempt in Australia to monitor climate and health in a way that may show their relationship. The complex chains of effect mean there would be great uncertainty in showing that climate change over time—not just a particular climate event—has caused ill health in any particular individual. However, it may well be possible to show effects at a population level.



Note: Prevention refers to ways of reducing greenhouse gas emissions. Adaptation (a form of late primary prevention) entails interventions to reduce health damage.

Source: Adapted from McMichael et al. 2006.

Figure 4.5: Main pathways by which climate change affects population health

4.3 Socioeconomic characteristics

As indicated in Figure 4.1, socioeconomic factors play an important—albeit relatively 'upstream'—role in influencing the health of individuals and populations. The nature and degree of different levels of health associated with differing levels of socioeconomic resources is further described in Chapter 3. In short, people or groups who are socially and economically disadvantaged tend to have worse health across the vast majority of conditions (Glover et al. 2004; AIHW: Mathers 1994).

Yet the relationships between socioeconomic characteristics and health status are not simple. As noted above, people who are disadvantaged have poorer health than those with some social or economic advantages. In turn, illness or disability can contribute to unemployment or exit from the labour force (the 'health selection effect'), which generally results in reduced income. Health problems can also impair ability to continue or succeed in education.

The association between health status and a given socioeconomic factor can also be affected by the relationships between different factors. For example, people with a high level of education are more likely than others to be employed in a white-collar or professional job, and people in such occupations tend to have higher incomes than unskilled workers. Therefore some of the connection between income and health is due to the indirect effects of education and occupation.

A further possible mechanism behind these relationships is the existence of features common to health status and various socioeconomic characteristics. For example, one theory is that people who have advantages are more prepared to defer immediate pleasures so they can do better in the long term—whereas those who are disadvantaged are less likely to do so. If they are less likely to invest time and effort in, say, education, then they may also be less likely to engage in healthy behaviours or avoid health risks. This can be illustrated with smoking rates: as socioeconomic status improves the prevalence of smoking decreases (Table 4.5).

Table 4.5: Smoking status by selected socioeconomic characteristics, persons aged 14 years or over, 2007 (per cent)

Characteristic	Never smoked[(a)]	Ex-smokers[(b)]	Current smokers[(c)]
All persons	55.4	25.1	19.8
Education			
Without post-school qualifications	57.5	21.5	21.0
With post-school qualifications	53.4	27.9	18.8
Socioeconomic status (SES)[(d)]			
Group 5 (lowest SES)	49.5	24.6	25.9
Group 4	53.0	25.3	21.7
Group 3	55.9	24.0	20.1
Group 4	57.0	25.0	17.9
Group 1 (highest SES)	59.3	27.4	13.4

(a) Never smoked more than 100 cigarettes or equivalent amount of tobacco in lifetime.

(b) Smoked at least 100 cigarettes or equivalent amount of tobacco in lifetime, but no longer smoke.

(c) Smoke daily or less often.

(d) In this table those with the 'lowest' SES are living in the 'worst-off' fifth of Australia's 37,000 ABS Census Collection Districts and the 'highest' are in the 'best-off' fifth. Derived from the SEIFA 4—see Box 3.1.

Source: Preliminary data from the 2007 National Drug Strategy Household Survey.

This section provides details on a number of socioeconomic characteristics that have been shown to be determinants of health; that is, they play some causal role in health status. The most recent summary data are presented in the Australian context, along with an indication of trends in each indicator over the past decade.

Education

Education imparts health benefits to individuals, their families (particularly children), and societies as a whole (Wolfe & Zuvekas 1997, Groot & van den Brink 2006). Higher levels of education are related to higher income and better employment prospects (see below), and can also affect health directly by providing knowledge and skills for a healthy lifestyle and for gaining better access to health services.

Educational attainment among the Australian population is rising. More than half (51%) of all people aged 15–64 years had a post-school qualification in 2006, compared with 42% in 1996. Much of this growth reflects the increase in the proportion of people with bachelor or higher degrees (Table 4.6).

Table 4.6: Highest post-school qualification of persons aged 15–64 years, 1996–2006 (per cent)

Qualification	1996	1998	2000	2002	2004	2006
Bachelor degree or above	12.8	14.3	15.7	17.8	18.9	20.6
Diploma or certificate	29.4	27.6	28.1	29.8	31.3	30.8
None	57.7	58.1	56.2	51.8	49.1	47.6

Note: Totals may not add to 100% because the level of highest non-school qualification of some persons could not be determined.

Source: ABS 2006c.

Apparent retention rates to Year 12 reflect the proportion of students in a cohort who remain in secondary education from the beginning of secondary schooling to Year 12. In 2006, the national apparent retention rate was 75%, with some disparity between males (69%) and females (81%) (ABS 2007c). Rates more than doubled throughout the 1980s and early 1990s, but have stabilised over the past decade. Apparent retention rates in 2006 were significantly lower for Indigenous students (40%) than for Australian students generally.

Employment status and occupation

Employment status, and unemployment in particular, is strongly related to health status. Unemployed people have higher mortality and more illness and disability than those who are employed, even after taking other factors into account. Studies that follow people over time indicate that this relationship is not due to health selection effects; that is, it is not due to people first getting sick and then being unemployed as a result. Lack of work can contribute to poor health in at least two ways: first, it reduces people's ability to buy health-related goods and services (such as nutritious food, housing and health care); second, it can have strong psychological and social impacts (Mathers & Schofield 1998).

Between 1996–97 and 2006–07, total and part-time employment rates rose and unemployment rates fell for both sexes (Table 4.7). In 2006–07, 65% of Australians aged 15 years and over were in the labour force—62% were employed and 3% were unemployed, giving an unemployment rate of 4.5%. Here, the term 'unemployment' refers to those who wanted employment but could not get it. Females were less likely to be employed

(55%) than males (69%). Of those who were employed, 55% of females and 85% of males worked full time.

Among people who are employed, there is a relationship between occupation and health. Generally, people working in manual and low-skilled jobs have poorer health, more disability and higher mortality than people in managerial/professional occupations. This relationship exists even after allowing for differences in education (Li et al. 2000). A large part of this inequality has been attributed to different levels of risk from exposure to physical hazards, and to the psychosocial effects of lower levels of control in one's job (Schrijvers et al. 1998; Rahkonen et al. 2006).

Table 4.7: Employment status of persons aged 15 years and over, 1996–97 and 2006–07

	1996–97			2006–07		
Measure	**Males**	**Females**	**Persons**	**Males**	**Females**	**Persons**
			Number ('000)			
Labour force size	5,214	3,955	9,169	5,945	4,878	10,824
			Per cent			
Participation rate[(a)]	73.4	53.8	63.4	72.2	57.6	64.8
Employed persons[(a)]	67.1	49.5	58.1	69.2	54.8	61.9
Unemployment rate[(b)]	8.6	8.0	8.3	4.3	4.8	4.5
Part-time workers[(c)]	11.8	43.1	25.2	15.1	44.8	28.5

(a) Per cent of the total population aged 15 years and over.

(b) Per cent of the labour force.

(c) Per cent of all employed persons.

Note: Reference periods are annual averages for the year ending 30 June.

Source: ABS 2007e.

In Australia, occupation is classified by the Australian Standard Classification of Occupations, which has three broad categories: professional, 'white-collar' and 'blue-collar'. In the decade since 1997 the professional workforce has grown considerably and the proportion of people in white-collar and blue-collar occupations has fallen (Table 4.8). This is likely to have contributed to the generally improving health of Australians, given the association between occupation and health status.

The largest of the three occupation groups in 2007 was professionals (41%) followed by white-collar workers (34%). One in four (25%) employees was classified as blue-collar. White-collar workers were mostly females and blue-collar occupations were dominated by males. Males and females were equally likely to be employed in professional occupations.

Table 4.8: Occupational group of employed persons aged 15 years and over, 1997 and 2007 (per cent)

	1997			2007		
Occupational group	**Males**	**Females**	**Persons**	**Males**	**Females**	**Persons**
Professional	37.6	33.1	25.6	40.7	40.7	40.7
White-collar	28.6	46.2	36.3	27.6	42.7	34.4
Blue-collar	33.8	20.7	28.1	31.7	16.6	24.9

Source: ABS 2007f.

Income and wealth

Income is related to health, both at the level of individuals and societies (see Figure 4.2). Much of this relationship appears to be due to the association between income, education and occupation. Apart from this, high incomes increase access to goods and services beneficial to health, such as health care, better food and housing, and preventive health measures.

It has been suggested that the degree of wealth inequality in a society, not just its average wealth, can affect its health. If two countries had the same average income, for example, but one had more inequality in its people's incomes, then that country would be expected to have worse health. However, this issue is strongly debated and it appears that any relationship may be weak in countries with high average incomes.

The period 1995–96 to 2005–06 has seen considerable growth in Australians' incomes. The 'median equivalised disposable household income' (that is, the income available to individuals, after adjusting for differences in household size) was $563 per week in 2005–06, 35% higher in real terms than for 1995–96 (ABS 2007d).

Income distribution across the population is commonly measured by percentile ratios. In 2005–06, the equivalised disposable household income level at the top of the 80th percentile (that is, the value dividing the bottom 80% of households from the top 20%) was $867 per week, and the income level at the top of the 20th percentile was $340. The ratio of these two income levels, known as the P80/P20 ratio, was 2.55 (*NHPC indicator 2.03*).

A number of changes were introduced to the ABS Survey of Income and Housing in 2003–04, making it difficult to assess trends in income distribution over recent years (ABS 2006e). However, according to the P80/P20 measure there do not appear to have been any significant changes in income distribution over the period 1995–96 to 2005–06 (Table 4.9).

Table 4.9: Income ratio of Australian households, 1995–96 to 2005–06

Ratio	1995–96	1996–97	1997–98	1999–2000	2000–01	2002–03	2003–04[(a)]	2005–06
P80/P20[(b)]	2.58	2.54	2.56	2.64	2.63	2.63	2.50	2.55

(a) A number of methodological improvements were made to the ABS Survey of Income and Housing in 2003–04. As a result, data from 2003–04 onwards are not directly comparable with those from previous surveys.

(b) The income at the upper value of the 80th percentile, divided by the income at the upper value of the 20th percentile, when households are ranked by equivalised disposable income.

Source: ABS 2007d.

Another common measure of relative income disadvantage is the proportion of people living in households with equivalised disposable incomes below 50% of the national median. According to this measure, 11% of Australians (more than 2.2 million people) experienced relative income disadvantage in 2005–06 (AIHW 2007).

An individual's wealth or accumulated assets can buffer material living standards, particularly in periods of low income. In 2003–04, Australian households had an average of $537,100 each in assets, of which three-quarters were non-financial assets, such as the family home. However this asset base was not evenly distributed: the wealthiest 20% of households accounted for 59% of total household wealth, and the least wealthy 20% owned just 1% of total household wealth (ABS 2006e).

Family structure

Married people tend to be healthier and live longer than those who are unmarried (Coombs 1991). Some of this is likely to be due to 'marital selection'—that is, people who are healthy, or with determinants of good health such as higher education or income, may make more attractive marriage partners. However, after accounting for this, being single is still associated with higher mortality than being married, according to studies that follow individuals through time (Cheung 2000). Health benefits are similar for those living together and those formally married (Wu et al. 2003). Reasons for this protective effect may include greater material resources and social support, and a positive impact of partners on health behaviours.

About half (50%) of all Australians aged 15 years and over were in a registered marriage in 2006, with a further 9% in a de facto marriage (including same-sex couples) (ABS 2007g). People aged less than 25 years, and 80 years and over, were substantially less likely to be married. Over the period 1996–2006 there was a small increase in the percentage of the population overall who were not married. In 2006 however, compared with 10 years earlier, higher proportions of people aged 65 years and over were currently married, probably because of increased life expectancy.

Research shows that children and young people in lone-parent households have poorer health than those in two-parent households. However, this increased risk in lone-parent households appears to be due to material disadvantage rather than the family structure itself, as these households are much more likely to experience unemployment and have low incomes (AIHW: Mathers 1995; Spencer 2005).

In 2006, 22% of families with children aged under 15 years were lone-parent families, an increase from 19% in 1996 (Table 4.10). There were over 450,000 lone-parent families with children in 2006.

Table 4.10: Families with children aged under 15 years, by family composition, 1996 and 2006

	1996		2006	
Family composition	**Number ('000)**	**Per cent**	**Number ('000)**	**Per cent**
Couple families	1,619	81	1,627	78
Lone-parent families	389	19	456	22
Total	**2,008**	**100**	**2,083**	**100**

Note: Families with children aged under 15 years may also have dependent students and non-dependent children.

Source: ABS 1997; 2007g.

4.4 Knowledge, attitudes and beliefs

People's knowledge, attitudes and beliefs about health can influence their health behaviours, and consequently their present and future health status. The likelihood of an individual being motivated to adopt health-enhancing behaviours—rather than behaviours which are not conducive to health—is in part a function of the level of knowledge, attitudes and skills which the person has in relation to health risks.

For this reason, measures of knowledge and attitudes are often taken to assess the reach and effectiveness of health promotion campaigns, or to provide insights into barriers to behaviour change.

With increasing availability of electronic information (via the Internet), never before has the general population had so much access to 'knowledge' about health. Similarly, in the last decade an increase in health information presented through the media (largely television) has resulted in entire programs devoted to good health and positive lifestyle behaviours. Yet many people still behave in ways that can harm their own health and even that of others around them.

For example, the ill effects of smoking have been well documented over time, and are the focus of many public health campaigns. For many, the messages are getting through—smokers have increasingly quit in recent decades, and results from the 2007 National Drug Strategy Household Survey show that two in five adults could correctly nominate tobacco as the leading cause of drug-related deaths in Australia. However, the survey showed that many Australians either approved of (14.3%) or were neutral about (22.5%) adults regularly smoking tobacco. Approval was greater among those who had smoked in the last 12 months (39.1%) than among those who had not (7.6%). This relationship also applied for many illicit drugs, where those who had recently used a particular drug were at least 10 times as likely to approve its use as those who had not.

Regular exercise helps to maintain good health by helping prevent or manage some conditions, maintaining a healthy musculoskeletal system, and controlling body weight. However, many people still do not exercise enough to benefit their health, with insufficient time to exercise being the most common constraint Australian adults report as a barrier to sports or physical recreation (Table 4.11). Health or fitness was the most common motivator for participation, suggesting that if a conviction in the value of positive health behaviours is strong enough it may be influential in choosing those behaviours.

Table 4.11: Participation in sport and physical recreation: main constraints and motivators, persons aged 15 years and over (per cent)

Factor	Males	Females	Persons
Main constraints[(a)]			
Insufficient time[(b)]	35.0	33.4	34.2
Not interested	18.9	18.2	18.5
Age/too old	15.8	17.8	16.8
Ongoing injury/illness	15.0	13.8	14.4
Main motivators[(c)]			
Health/fitness	49.6	58.6	54.2
Enjoyment	27.4	16.1	21.6
Wellbeing	6.0	8.8	7.5
Social/family	8.4	5.5	6.9

(a) For people who had little or no participation in the past 12 months.

(b) Because of work/study, family and other reasons.

(c) For people who participated at least 13 times in the past 12 months.

Source: ABS 2007h.

The ability to acquire knowledge about health enables a person to recognise health problems (in themselves or others), make choices about behaviours, and access health services when required. However, some groups within the community may have difficulty accessing, understanding or using information about health. For example, people from non-English-speaking backgrounds may not assimilate new information as quickly as native English speakers, and they may therefore retain traditional beliefs and use traditional health treatments. Studies have also shown that some people from non-English-speaking backgrounds are not as informed about risky health behaviours as their English-speaking counterparts (Perusco et al. 2007). In some cases, those who come from countries where smoking is seen as the social norm are often not aware of the health and social problems associated with smoking (Le & Le 2005).

Knowledge may be misinterpreted, or missed altogether by the population groups that require it most. Results from the last National Breast Cancer Centre Breast Health Survey show that only 50% of females identified age as a risk factor for breast cancer—in Australia, about 75% of breast cancers occur in females aged 50 years and over (NBCC 2005). Many studies have indicated that early detection of breast cancer can make a difference to successful treatment; however, this survey showed that over one-third of women who noticed a breast symptom (that is, a change in the look or feel of a breast) waited more than 1 month before contacting a doctor.

There is wide acknowledgement within the community that exposure to the sun's rays places people at greater risk of developing skin cancer. Despite the level of public awareness, many Australians do not act on this message, particularly the younger population (Centre for Epidemiology and Research 2007). In general, many young people use sunscreen (43%). However, recommendations state that sunscreen should be used in combination with other forms of sun protection; that is, wearing of hats, sunglasses and appropriate clothing, as well as staying in the shade. In 2005, almost half (48%) of young people failed to combine the recommended three or more sun protective behaviours on sunny summer days.

Any amount of sunburn can damage skin cells and therefore increase the risk of developing skin cancer. One-third of adolescents (12–17 years of age) incorrectly believe that people only get skin cancer if they get burnt often, and about 80% of adolescents reported being burnt at least once in the last summer. Most teenagers also have a preference for getting a tan—70% of boys and 80% of girls (Centre for Epidemiology and Research 2007).

The positive attitude towards tanning in the general community is also reflected by the increase in the number of solariums in the last decade (Cancer Council of Victoria 2007). Despite evidence that links solarium use with the risk of melanoma and other skin cancers (WHO 2003), in capital cities the number of solariums has increased fourfold.

4.5 Health behaviours

Health behaviours can be influenced by any number of other determinants in combination with a person's individual makeup. For example, the level and pattern of physical activity can reflect a person's preferences modified by cultural and family influences. It can also be influenced by climate, availability of suitable spaces for exercise, and an individual's personal resources. Further, it can be affected by the presence of disease or disability.

In terms of contribution to the burden of disease, health behaviours featured as six of the top ten determinants in 2003 (see Table 4.1). The greatest single contributor to the burden was tobacco smoking (7.8% of total DALYs). Physical inactivity also made a substantial contribution at 6.6%.

Tobacco smoking

Impact and prevalence

Tobacco smoking is the single most preventable cause of ill health and death in Australia, contributing to more drug-related hospitalisations and deaths than alcohol and illicit drug use combined. It is a major risk factor for coronary heart disease, stroke, peripheral vascular disease, cancer and a variety of other diseases and conditions.

Tobacco smoking is estimated to be responsible for 7.8% of the burden on the health of Australians: around 10% of the total burden of disease in males and 6% in females (Table 4.1). The World Health Organization estimates that tobacco causes 8.8% of deaths (4.9 million) globally and 4.1% of the total burden of disease (WHO 2002).

The tangible costs of tobacco use in Australia were estimated to be $10.8 billion in 2004–05 (Collins & Lapsley 2008), or about 1.3% of gross domestic product.

Estimates from the 2007 National Drug Strategy Household Survey (NDSHS, see Box 4.2) indicate that one in six Australians aged 14 years and over smoked daily (16.6%, or around 2.9 million Australians) (*NHPC indicator 2.05*). Males were more likely to be daily smokers (18.0%) than females (15.2%). Former smokers outnumbered smokers at 25.1% of the population (27.9% of males and 22.4% of females) and 55.4% had never smoked (50.9% of males and 59.8% of females). Compared with overall smoking rates, smoking is far more common among those of lower socioeconomic status and among Indigenous Australians (see Chapter 3 and Section 4.3).

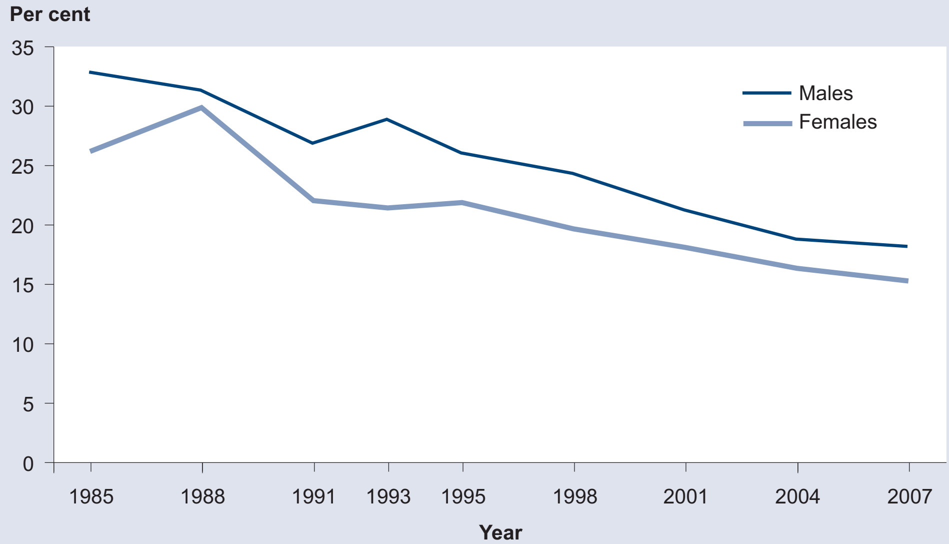
Box 4.2: The National Drug Strategy Household Survey

The National Drug Strategy Household Survey is conducted by the AIHW at 3-yearly intervals. It collects comprehensive information about people's use of and attitudes towards tobacco, alcohol and illicit drugs; experiences of alcohol- and other drug-related harm; and physical and mental health.

The latest survey, conducted in 2007, was the ninth in a series that began in 1985, and collected information from over 23,000 respondents. People living in non-private dwellings and institutions are not included in the sample. From 2004 onwards, the survey includes people aged 12 years and over; previously the scope was 14 years and over.

A limitation of the survey is that people may not accurately report information relating to illicit drug use and related behaviours because these activities may be illegal. This means that results relating to illicit drugs (see section below) are likely to underestimate actual prevalence.

In Australia, the overall smoking rate has been declining since the 1950s, when an estimated 70% of males and 30% of females smoked. Between 1985 and 2007, the prevalence of daily smoking declined by 14.7 percentage points for males and 10.9 percentage points for females (Figure 4.6). This general trend is corroborated by general practice data from the Bettering the Evaluation and Care of Health (BEACH) study, which shows daily smoking among patients aged 18 years and over declining from 19.2% in 1998–99 to 16.1% in 2006–07 (Britt et al. 2008).



Sources: AIHW 2005; data from the 2007 NDSHS.

Figure 4.6: Daily smokers, population aged 14 years and over, 1985–2007

Smoking among young people

In 2007, about one in 18 persons aged 12–19 years smoked daily. Rates were around 2% for those aged 12–15 years and markedly higher for those aged 16 years and over (Table 4.12). About 97% of the 12–15 years age group reported having never smoked a full cigarette; about the same proportions for both males and females. Estimates of tobacco use by younger people should be interpreted with caution, however, because of the low prevalence and relatively smaller sample sizes compared with those for adults.

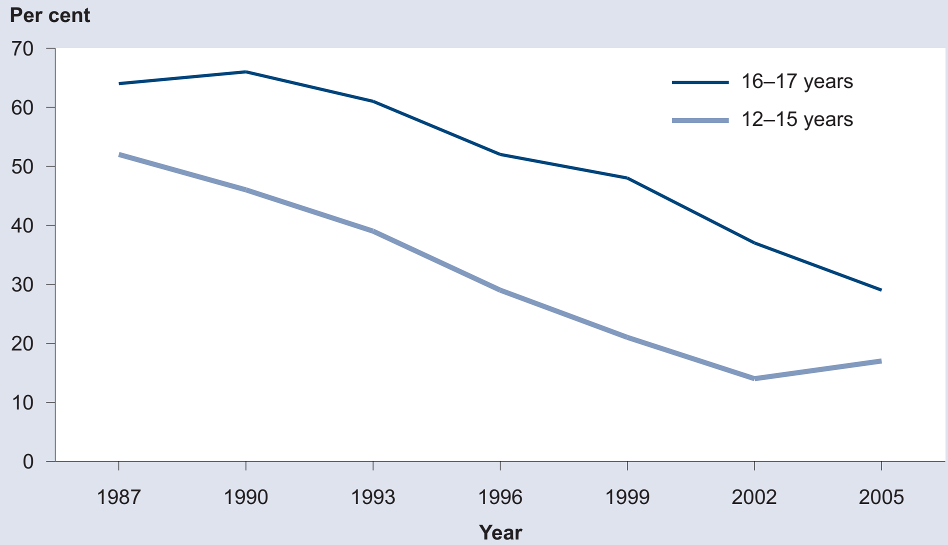
Table 4.12: Daily smokers: proportions among those aged 12–19 years, 2007 (per cent)

	Age group			
Sex	**12–15**	**16–17**	**18–19**	**12–19**
Males	1.5	4.1	11.6	4.7
Females	2.5	7.4	13.7	6.6
Persons	2.0	5.7	12.6	5.6

Source: Data from the 2007 NDSHS.

The ability of teenagers to purchase cigarettes increases their likelihood of smoking. Accordingly, all states and territories in Australia have legislation that prohibits the supply of cigarettes to people under the age of 18 years.

Estimates from the Australian Secondary Schools Alcohol and Drug surveys show that the proportion of current smokers aged 12–15 years who had purchased their most recent cigarette (instead of acquiring it in some other way) declined markedly from 52% in 1987 to 17% in 2005, and for current smokers aged 16–17 years the decline was from 64% to 29% (Figure 4.7) (*NHPC indicator 3.02*).



Source: White & Hayman 2006.

Figure 4.7: Teenage smokers who purchased their most recent cigarette, 1987–2005

Children exposed to tobacco smoke in the home

Children are particularly susceptible to the effects of passive smoking—when they are close to someone smoking and breathe in the smoke contaminating the air. For children, this so-called environmental tobacco smoke increases the risk of a range of health problems. These include respiratory infections, middle ear infections, onset and worsening of asthma, decreased lung function, eye and nose irritation, low birthweight, and sudden infant death syndrome (NDS 2002; NHMRC 1997).

The benefits of reducing children's exposure to environmental tobacco smoke at home include reduced school absenteeism, increased school performance, reduced uptake of smoking, and lower consumption of tobacco among children who smoke (NDS 2002).

Over the period 1995–2007, around one-third of all households included dependent children (that is, children aged under 15 years). In 1995, around 31% of these households included someone who smoked inside the home (Table 4.13). With the general decline in smoking prevalence, and the increasing awareness of the effects of environmental tobacco smoke, this figure fell to less than 8% of households in 2007, or around 300,000 dependent children exposed to tobacco smoke inside the home (*NHPC indicator 2.01*).

Table 4.13: Household smoking status(a), by dependent children status(b), 1995–2007 (per cent)

	Dependent children					No dependent children(c)				
Household smoking status	**1995**	**1998**	**2001**	**2004**	**2007**	**1995**	**1998**	**2001**	**2004**	**2007**
Smokes inside the home	31.3	22.6	19.7	12.3	7.8	32.2	26.6	21.3	17.4	14.8
Only smokes outside the home	16.7	21.5	24.9	28.1	29.2	13.7	18.0	19.8	17.6	19.0
No-one at home regularly smokes	52.0	55.9	55.4	59.6	63.1	54.1	55.4	58.9	65.0	66.2

(a) Household smoking status as reported by respondents aged 14 years and over.

(b) Households including dependent children aged 14 years and under.

(c) Includes dependents aged 15 years and over.

Source: AIHW analysis of the NDSHS from 1995 to 2007.

International comparisons

The most recent report on smoking among OECD member countries places Australia among the best in the world. More generally, the prevalence of daily smoking ranges from about one in three of the adult population in Greece, to less than one in six in Sweden (Figure 4.8).

With few exceptions, these countries saw a decline in the prevalence of daily smoking between 1966 and 2006, with major reductions in the early part of this period and a slowing of the decline in the last decade.

Physical inactivity

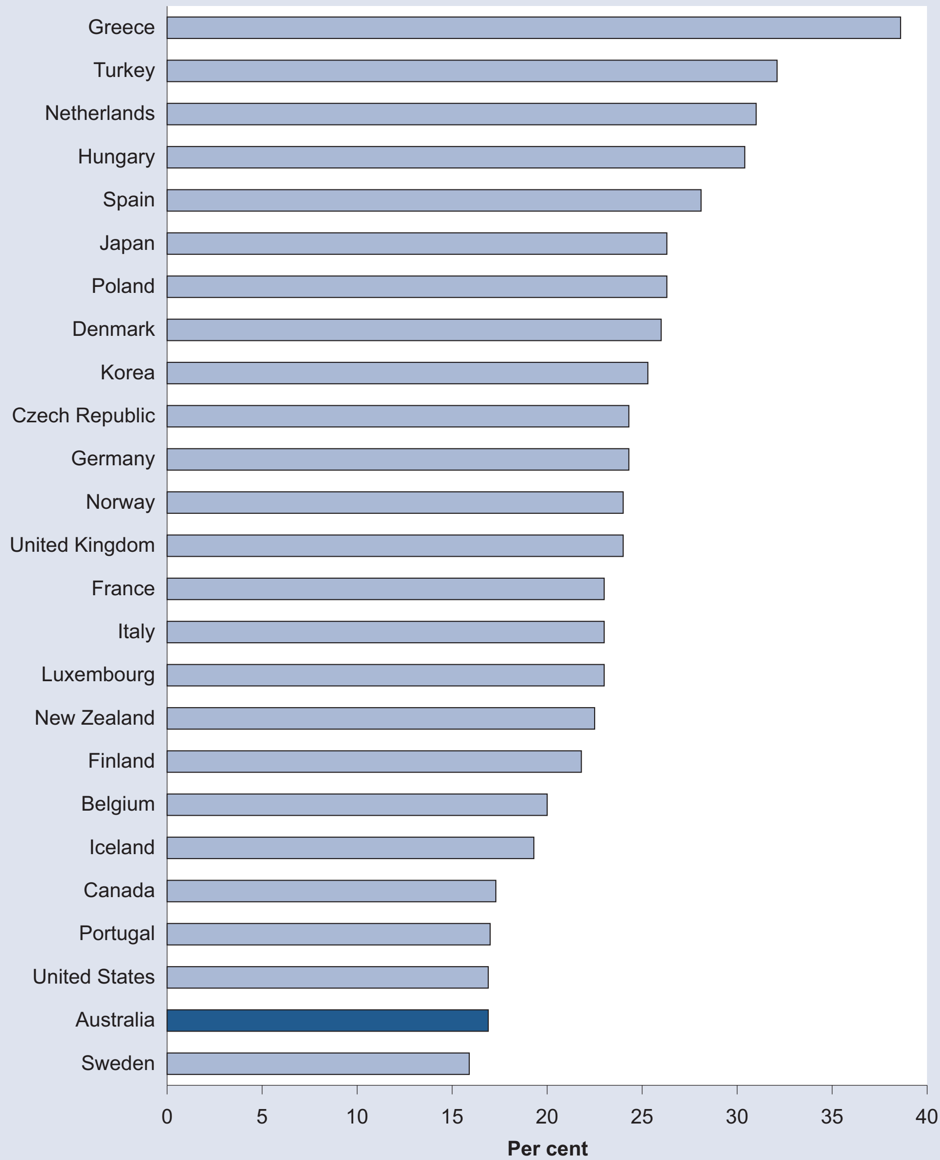
Physical inactivity is associated with an increased risk of ill health and death, particularly relating to cardiovascular disease. Put another way, regular physical activity reduces cardiovascular risk in its own right, reduces cardiovascular risk factors such as overweight and high blood pressure, and improves the levels of HDL (the 'good' cholesterol). Regular exercise also helps protect against Type 2 diabetes and some forms of cancer, and strengthens the musculoskeletal system, helping to reduce the likelihood of osteoporosis (low bone-mineral density) and the risk of falls and fractures. In addition, taking part in physical activity improves mental wellbeing (in both the short term and longer term) by reducing feelings of stress, anxiety and depression (Dunn et al. 2001).

Box 4.3 Understanding physical activity

Put simply, physical activity is any bodily movement produced by the muscles that results in energy expenditure. Exercise is a subset of physical activity—defined as planned, structured and repetitive bodily movement done to improve or maintain one or more components of physical fitness. As an example, most sports include physical activity done for enjoyment, exercise, or both.

Although most measures of physical activity focus on deliberate activity in leisure time, other forms of activity—such as walking/cycling for transport, and activity associated with a person's job—are important components of overall activity. Indeed, even the activity associated with everyday tasks like shopping and housework—or so-called incidental activity—is part of the physical activity spectrum and contributes to the health benefits.

Physical activity is a critical factor in determining a person's body weight. If the energy in (via food and drink) is not balanced by energy expenditure (via activity and internal bodily functions) and the situation is sustained, the excess food energy is stored as body fat. Hence, at a population level, physical inactivity may be an important contributor to rising levels of obesity.



Notes

1. Data are for the year specified, or one to three years earlier or later. No data within this range were available for the Slovak Republic.
2. The prevalence of 16.8% for Australia reported here is for persons aged 15 years and over, and differs from that reported at the beginning of this section for persons aged 14 years and over.

Sources: OECD 2007; data from the 2007 NDSHS.

Figure 4.8: Prevalence of daily smoking, population aged 15 years and over, selected OECD countries, 2006

Low levels of physical activity were estimated to have accounted for 6.7% of the burden of disease and injury in Australia in 2003, ranking it fourth among the more direct determinants of ill health (see Table 4.1). In addition, a recent report commissioned by Medibank Private estimated that the direct cost of physical inactivity in Australia was $1,494 million per annum (2006–07 prices), or about 0.15% of gross domestic product (Econtech 2007). This estimate was based on the direct costs attributable to physical inactivity for the following medical conditions: coronary heart disease, stroke, Type 2 diabetes, mental disorders, breast cancer, colon cancer, and the incidence of fall-related injuries.

Assessed against the national physical activity guidelines (see Box 4.4), a significant majority of Australians are not physically active enough. Levels of physical activity in recent decades may reflect increased time spent in sedentary or minimally active states, perhaps as a result of labour-saving devices and passive forms of entertainment (such as computers, television, video games and the Internet). Low physical activity levels may also be related to increasing urbanisation, as well as reductions in 'active transport' among adults and children associated with increased car ownership and use, along with safety concerns leading to less walking, cycling and transport-related physical activity. Research also indicates that people perceive that they have less discretionary time available for exercise or sporting activities than in previous years (Bauman et al. 2002).

Box 4.4: National guidelines for physical activity

The National Physical Activity Guidelines for Australians (DHAC 1999) recommend at least 30 minutes of moderate-intensity physical activity on most, preferably all, days of the week. The guidelines for children and adolescents (DoHA 2004a, 2004b) recommend at least 60 minutes of moderate to vigorous physical activity every day. Examples of moderate-intensity activity are brisk walking, swimming, doubles tennis and medium-paced cycling. More vigorous physical activity includes jogging and active sports like football and basketball. These guidelines correspond to the notion of 'sufficient' activity—the amount needed to obtain health benefits.

For population-monitoring purposes, there are two ways of calculating 'sufficient' activity. These are: 'sufficient time' (at least 150 minutes per week of moderate-intensity physical activity, with each minute of vigorous activity counted as two minutes of moderate activity); and 'sufficient time and sessions' (at least 150 minutes of moderate-intensity physical activity accrued over at least five sessions per week, with vigorous activity counted double). Sufficient time and sessions is the preferred measure of sufficient activity for health as it takes into account the frequency of physical activity as well as duration. Research suggests that even shorter sessions (down to 10 minutes) can be beneficial as well, provided they add up to the required total over the week.

Measuring physical activity

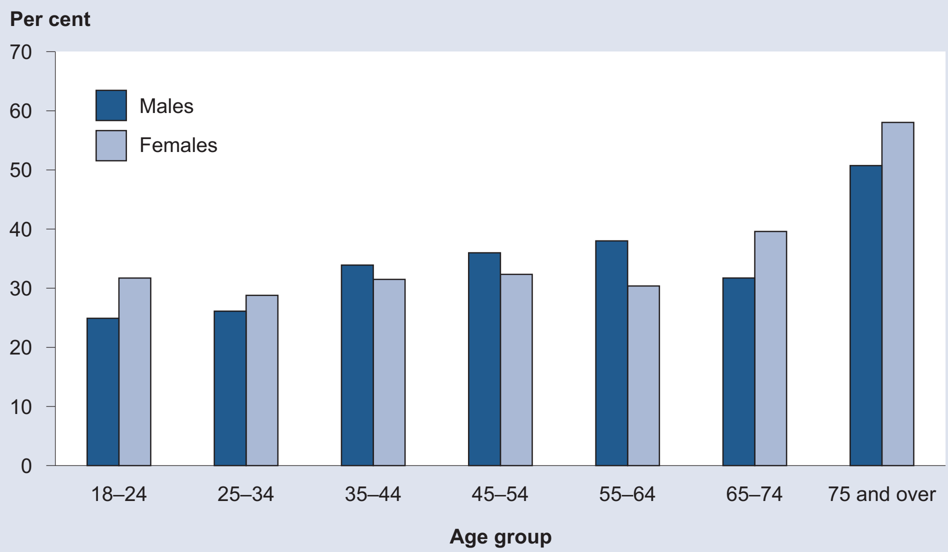
Various methods are available to measure physical activity, so results from different surveys can provide different estimates of the proportion of people who are sufficiently active for health. The data obtained from the 1997, 1999 and 2000 National Physical Activity Surveys (NPAS) align closely to the recommended levels of activity in the national guidelines and allow assessment of physical activity in relation to the 'sufficient time and sessions' measure (see Box 4.4). This series of surveys examined self-reported participation in walking (including walking for transport), other moderate activity and vigorous activity during leisure time, using the Active Australia Survey instrument. More recent data using the same instrument are available from state and territory surveys, conducted using computer-assisted telephone interviewing (CATI).

Non-leisure time physical activity, such as activity at work or around the house, also contributes to overall physical activity. However, this component of physical activity is difficult to measure, and the methods used to measure it are not generally practical for use in population surveys.

Prevalence and trends

Estimates from the 2004 state and territory CATI surveys suggest that half of adults are not undertaking sufficient physical activity (AIHW 2006) (relates to *NHPC indicator 2.08*). Females reported higher levels of inactivity than males in all states and territories. Data from the 2000 NPAS show that the most inactive adults were aged 30–59 years and the most active were aged 18–29 years, for both males and females. The proportion reporting no leisure time physical activity over the previous week increased with age, from about 1 in 10 aged 18–29 years to 2 in 10 aged 45 years and over.

The 2004–05 National Health Survey (NHS) also included a measure of physical activity. Overall, about one-third of both men and women reported that they did not exercise in the 2 weeks before the survey. Somewhat surprisingly, the inactivity tended to increase only modestly with age, except that persons aged 75 years and over were much less likely to have exercised than the younger age groups (Figure 4.9).



Source: ABS 2006f.

Figure 4.9: Prevalence of no exercise in the previous 2 weeks, 2004–05

Available data suggest little change in physical activity patterns during the 1980s and much of the 1990s in Australia, although there was an increase in the estimated proportion of Australians with lower-than-recommended levels of physical activity between the 1997 and 2000 NPAS surveys (from 49% to 54%). During this latter period, the prevalence of insufficient levels of physical activity increased among males and females and for all age groups under 60 years. Data from the 1995, 2001 and 2004–05 NHS also suggest little change in physical activity patterns, with the proportion of people aged 18 years and over reporting sedentary or very low levels of physical activity (that is, less than 100 minutes of exercise over 2 weeks) remaining around 30–35% (ABS 2006f).

Specific population groups

Physical activity is very important in maintaining and improving health and wellbeing in older age groups, particularly for preventing falls and broken bones. Inactivity in elderly people is associated with a loss of both balance and bone mass. The findings from the 2000 NPAS suggest that about 21% and 14% of older Australian males and females, respectively, had sedentary levels of activity, and a further 33% and 44% had some activity but it was not 'sufficient'.

Physical activity is also essential for the healthy growth and development of children. Although there are no recent national data on the physical activity levels of Australian children and adolescents, surveys conducted among school children in New South Wales and Western Australia found that between one-quarter and one-third of students surveyed had too little physical activity (Booth et al. 2006; Hands et al. 2004). However, the NSW survey showed that physical activity among school children had increased over the period 1985–2004, even though there were increases in rates of overweight and obesity over the same period.

The National Aboriginal and Torres Strait Islander Health Survey found that the proportion of Indigenous people aged 15 years and over in non-remote areas with sedentary or low levels of exercise was higher in 2004–05 than in 2001 (75% compared with 68%)(ABS 2006f, 2006g). After adjusting for differences in the age structure of the Indigenous and other Australian populations, Indigenous people in non-remote areas were as likely as other Australians to be sedentary or engaged only in low levels of exercise in 2004–05.

Alcohol consumption

Excessive alcohol consumption is a major risk factor for morbidity and mortality. The World Health Organization estimates that, worldwide in 2002, alcohol caused 3.2% of deaths (1.8 million) and 4.0% of the burden of disease (WHO 2002). In Australia, it has been estimated that harm from alcohol was the cause of 3.8% of the burden of disease for males and 0.7% for females, ranking it sixth out of the 14 risk factors studied (Table 4.1).

There are also social costs to the consumption of alcohol. In Australia in 2004–05, the total tangible cost attributed to alcohol consumption (which includes lost productivity, health-care costs, road accident-related costs and crime-related costs) was an estimated $10.8 billion (Collins & Lapsley 2008), or around 1.2% of gross domestic product.

Nevertheless, some benefits are thought to arise in the longer term from low to moderate alcohol consumption, largely through reduced risk of stroke and coronary heart disease and largely in older females. The net harm associated with alcohol consumption, after taking into account these benefits, was estimated at around 2.0% of the total burden of disease in Australia in 2003.

Alcohol consumption patterns

Analysis of the NDSHS from 1993 to 2007 shows that four in five Australians aged 14 years and over drank alcohol, and one in ten did so daily (Table 4.14). In 2007, an estimated 82.9% of Australians had drunk alcohol in the past year. These rates have been fairly stable since 1993.

Table 4.14: Alcohol drinking status, population aged 14 years and over, 1993–2007 (per cent)

Drinking status	1993	1995	1998	2001	2004	2007
Daily	8.5	8.8	8.5	8.3	8.9	8.1
Weekly	39.9	35.2	40.1	39.5	41.2	41.3
Less than weekly	29.5	34.3	31.9	34.6	33.5	33.5
Ex-drinkers[(a)]	9.0	9.5	10.0	8.0	7.1	7.0
Never a full serve of alcohol	13.0	12.2	9.4	9.6	9.3	10.1

(a) Ex-drinkers are those who consumed at least a full serve of alcohol in their lives, but not in the last 12 months.

Sources: AIHW 2005; data from the 2007 NDSHS.

International comparisons

For international comparison purposes, a useful measure is per person consumption of pure alcohol. This is a method of taking into account the different alcohol content of different beverages—for example, a typical Australian beer contains 5% alcohol per volume, meaning that a 375 mL bottle will contain about 19 mL of pure alcohol. Using this measure, in 2006 Australia ranked in the middle of the OECD countries, at around 10 litres of alcohol per person aged 15 years or over per year (Figure 4.10). Across these 30 countries, consumption ranged from 16 litres per person per year in Luxembourg down to 1 litre in Turkey.

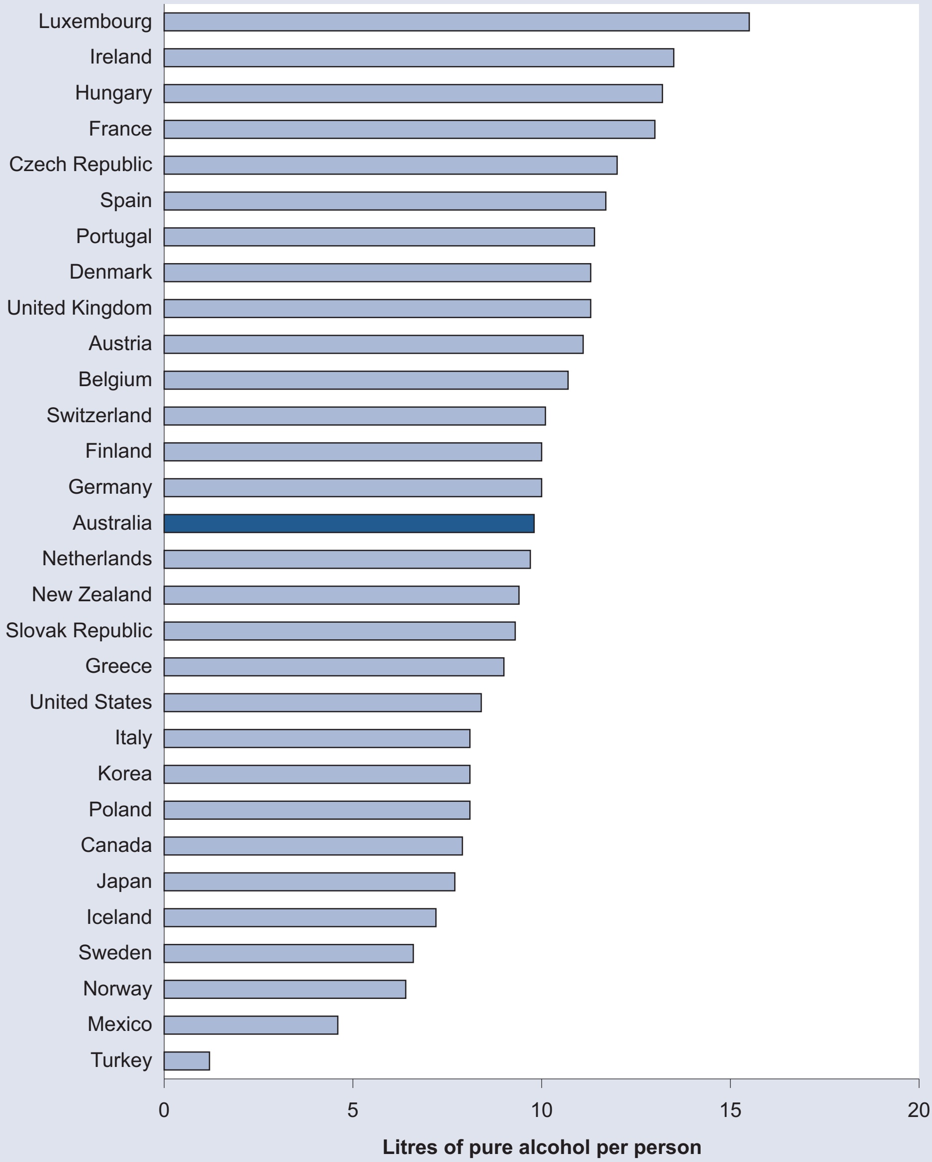
The pattern of change over time in per person alcohol consumption varies among the OECD countries. For the majority, including Australia, there appears to have been a peak of consumption in the 1970s and 1980s, then reductions over the 1990s and early 21st century. A few countries, notably Ireland and the United Kingdom, had an increase in consumption over the past 40 years, whereas Portugal and Italy had a major decrease.

Risk of harm from alcohol consumption

In 2001, the National Health and Medical Research Council (NHMRC) published alcohol consumption guidelines for males and females (NHMRC 2001a). They are expressed in terms of short-term and long-term risk of harm (injury, ill health and death). In late 2007, the NHMRC proposed revised guidelines, with the simplified overall recommendation that men and women not consume more than two standard drinks on any drinking occasion. This section reports against the 2001 guidelines, consistent with earlier AIHW reporting of alcohol risk.

According to the 2007 NDSHS, 17.1% of Australians aged 14 years and over had not consumed alcohol in the previous 12 months. Assessed against the 2001 guidelines, 10.3% had consumed at levels considered risky for health in the long term, and 20.4% had consumed—at least monthly—in a way that is risky for health in the short term (*NHPC indicator 2.06*).

Combining these, 60.8% of Australians in 2007 had drunk at levels considered low risk for harm in both the short and long term, and 8.6% had drunk at levels considered risky or high risk for both short-term and long-term harm (Table 4.15). (The words 'high risk', 'low risk' and 'risky' used below are also in terms of the 2001 guidelines.)



Note: Data are for 2006, or one to three years earlier or later.

Source: OECD 2007.

Figure 4.10: Alcohol consumption, population aged 15 years and over, OECD countries, 2006

Table 4.15: Risk of harm from alcohol, population aged 14 years and over, 2007 (per cent)

		Short-term risk[(a)]		
Long-term risk	Abstainer	Low risk	Risky or high risk	Total
Males				
Abstainer	14.0	. .	. .	14.0
Low risk	. .	60.9	14.9	75.8
Risky or high risk	. .	1.4	8.8	10.2
Total	*14.0*	*62.3*	*23.7*	*100.0*
Females				
Abstainer	20.1	. .	. .	20.1
Low risk	. .	60.6	8.8	69.4
Risky or high risk	. .	2.1	8.4	10.5
Total	*20.1*	*62.7*	*17.2*	*100.0*
Persons				
Abstainer	17.1	. .	. .	17.1
Low risk	. .	60.8	11.8	72.6
Risky or high risk	. .	1.7	8.6	10.3
Total	*17.1*	*62.5*	*20.4*	*100.0*

. . Not applicable.

(a) At least once per month.

Source: Data from the 2007 NDSHS.

Alcohol use and psychological distress

Analysis of the 2007 NDSHS shows that adult high-risk drinkers (15.3%) were more likely than adult low-risk drinkers (8.5%) to experience high or very high levels of psychological distress. These findings were based on the Kessler 10 scale (K10), which was developed for screening populations for psychological distress. The scale consists of 10 questions on non-specific psychological distress and relates to the level of anxiety and depressive symptoms a person may have experienced in the preceding 4-week period. The psychological distress may have preceded the alcohol use for some and, for others, alcohol use may have preceded the psychological distress.

Illicit drug use

Illicit drug use covers:

- the use of drugs which are illegal to possess (such as heroin and ecstasy)
- the use of volatile substances as inhalants (such as glue, solvent and petrol)
- the non-medical use of prescribed drugs.

Illicit drug use is a major risk factor for ill health and death, being associated with HIV/AIDS, hepatitis C virus (HCV), low birthweight, malnutrition, infective endocarditis (leading to damage to the heart valves), poisoning, mental illness, suicide, self-inflicted injury and overdose. The WHO estimates that globally 0.4% of deaths (0.2 million annually) and 0.8% of the total burden of disease are attributable to illicit drug use (WHO 2002).

In Australia, it is estimated that 2.0% of the burden of disease in 2003 was attributable to the use of illicit drugs, ranking it eighth out of the 14 risk factors studied (Table 4.1).

Trends in recent illicit drug use

According to the 2007 NDSHS, around 13.4% of the Australian population aged 14 years and over used illicit drugs in 2007 (Table 4.16). However, over recent years there have been decreases for each type of drug, with few exceptions. Marijuana/cannabis, at 9.1%, was the recently used illicit drug most commonly reported by this population—a small decline from rates of around 13% in most survey years between 1993 and 2001. Ecstasy was the second most common, used by an estimated 3.5% of the population in 2007, and more prevalent than meth/amphetamine (mainly methamphetamine, which includes 'ice') at 2.3%.

Table 4.16: Summary of recent[(a)] illicit drug use; population aged 14 years and over, 1993–2007 (per cent)

Substance	1993	1995	1998	2001	2004	2007
Marijuana/cannabis	12.7	13.1	17.9	12.9	11.3	9.1
Ecstasy[(b)]	1.2	0.9	2.4	2.9	3.4	3.5
Pain-killers/analgesics[(c)]	1.7	3.5	5.2	3.1	3.1	2.5
Meth/amphetamine, including 'ice'[(c)]	2.0	2.1	3.7	3.4	3.2	2.3
Cocaine	0.5	1.0	1.4	1.3	1.0	1.6
Tranquillisers/sleeping pills[(c)]	0.9	0.6	3.0	1.1	1.0	1.4
Hallucinogens	1.3	1.8	3.0	1.1	0.7	0.6
Injected drugs	0.5	0.6	0.8	0.6	0.4	0.5
Inhalants	0.6	0.6	0.9	0.4	0.4	0.4
Ketamine	n.a.	n.a.	n.a.	n.a.	0.3	0.2
Heroin	0.2	0.4	0.8	0.2	0.2	0.2
Other opiates/opioids[(c)]	n.a.	n.a.	n.a.	0.3	0.2	0.2
Barbiturates[(c)]	0.4	0.2	0.3	0.2	0.2	0.1
Methadone[(d)]	n.a.	n.a.	0.2	0.1	0.1	0.1
Steroids[(c)]	0.3	0.2	0.2	0.2	—	0.1
GHB[(e)]	n.a.	n.a.	n.a.	n.a.	0.1	0.1
Any illicit drug	*14.0*	*17.0*	*22.0*	*16.9*	*15.3*	*13.4*
None of the above	86.0	83.0	78.0	83.1	84.7	86.6

(a) Used in last 12 months.

(b) This category included substances known as 'designer drugs' before 2004.

(c) For non-medical purposes.

(d) For non-maintenance purposes.

(e) Gamma-hydroxybutyrate.

Source: AIHW 2005, data from the 2007 NDSHS.

Young people's use of illicit drugs

In 2007, of the population aged 12–15 years, an estimated 4.6% had used an illicit drug in the previous year. Illicit drug use was more common for young people aged 16–17 years (18.9%), and even more common for those aged 18–19 years (23.4%).

Most illicit drug use in the 12–15 years age group was of marijuana/cannabis (2.7%), followed by the non-medical use of pain-killers (1.1%). For all other substances surveyed, the prevalence in this age group was less than 1%.

Illicit drug use and psychological distress

Illicit drug use can be associated with a range of mental illnesses, and there has been much recent discussion of a relationship between heavy cannabis use and psychosis.

The 2007 NDSHS included the K10 scale of psychological distress, a set of questions that measures non-specific psychological distress related to the level of anxiety and depressive symptoms a person may have had over the previous 4 weeks.

Among the general community (aged 18 years and over, being the age range for which the K10 analysis is valid), less than 10% experienced high or very high levels of psychological distress (Table 4.17). But when this group is split into those who had used and those who had not used selected drugs in the last month, there was at least a twofold difference in that experience, with an almost sevenfold difference between users and non-users of heroin. However, by themselves these findings do not establish that drug use causes psychological distress, or vice versa.

Table 4.17: Psychological distress[(a)], by use of selected illicit drugs, persons aged 18 years and over, 2007 (per cent)

	Level of psychological distress		
Substance/behaviour	**Low**	**Moderate**	**High and very high**
All persons (aged 18+)	69.0	21.1	9.8
Any illicit drug			
Used in the last month	51.2	28.6	20.2
Not used in the last month	70.8	20.5	8.7
Marijuana/cannabis			
Used in the last month	51.2	27.2	21.5
Not used in the last month	70.1	20.8	9.1
Heroin			
Used in the last month	20.9	14.2	64.9
Not used in the last month	69.2	21.1	9.6
Meth/amphetamines			
Used in the last month	43.5	35.3	21.2
Not used in the last month	69.6	21.0	9.5
Ecstasy			
Used in the last month	45.4	34.4	20.2
Not used in the last month	69.5	20.9	9.6

(a) Using the Kessler 10 scale of psychological distress.

Source: Data from the 2007 NDSHS.

Injecting drug use

Apart from other risks, injecting drug use is a significant risk factor for transmitting bloodborne viruses such as HIV and HCV. From a national survey of clients of needle and syringe programs in 2006, around 2.8% of new HIV infections and 62% of HCV infections were attributed to injecting drug use (NCHECR 2007a).

Further, there is a strong association between the length of injecting practice and the prevalence of HCV. Of people with a history of injecting drug use for 10 years or more, 72% tested positive to HCV antibody compared with 18% of people with a history of injecting drug use of less than 3 years (Table 4.18). There is less evidence of such a relationship for HIV—only 1.6% of the long-term injecting drug users tested were positive for HIV antibody.

Table 4.18: Prevalence of HIV or HCV antibodies among injecting drug users aged 14 years and over, by history of injecting drug use, 2006 (per cent)

History of injecting drug use	Tested positive to HIV antibody			Tested positive to HCV antibody		
	Males	Females	Persons[(a)]	Males	Females	Persons[(a)]
Less than 3 years	1.7	—	1.0	16	22	18
3–5 years	2.5	—	1.4	32	28	30
6–10 years	1.8	0.6	1.5	49	65	55
10 or more years	2.3	0.3	1.6	70	75	72
History not reported	1.8	—	1.4	59	60	59
All	**2.1**	**0.3**	**1.5**	**60**	**64**	**62**

(a) Includes people whose sex was reported as transgender or whose sex was not reported.

Source: NCHECR 2007a.

The proportion of injecting drug users at needle and syringe programs around Australia who reported re-use of someone else's used needle and syringe in the previous month rose from 16% in 2001 to 18% in 2004, then fell to 13% in 2006 (NCHECR 2007b) (*NHPC indicator 3.01*).

In 2006, re-use of someone else's needle and syringe was generally reported as after use by only one person (7% of all participants), typically a regular sex partner (6%). Re-use of someone else's used equipment (other than needles and syringes) in the previous month was somewhat more common, at 20% for spoons and 15% for water.

Dietary behaviour

Diet plays a major role in health and in recent decades much evidence has shown that it can either reduce or increase the risk of various diseases (NHMRC 2003a). The *Global strategy on diet, physical activity and health* highlights the role of healthy diets in preventing diseases such as cardiovascular disease, Type 2 diabetes and certain types of cancer, which contribute substantially to the global burden of disease, death and disability (WHO 2006).

In Australia, current priorities for action on nutrition include promoting fruit and vegetable consumption, healthy weight, and good nutrition for mothers, babies and school-aged children, as well as improving nutrition for vulnerable groups and fostering the supply of safe and healthy food (SIGNAL 2001). There is evidence that Indigenous peoples have poorer nutrition-related health, so these priorities apply especially for them (NATSINWP 2001).

The NHMRC dietary guidelines for children, adults and older Australians (2003a, 2003b, 1999) recommend consuming a wide variety of nutritious foods, including a high intake of plant foods such as cereals, fruit, vegetables, legumes and nuts; choosing foods low in salt; and limiting alcohol intake. The guidelines also highlight the value of breastfeeding, and of preparing and storing food safely. Moderating sugar and fat intake—especially saturated fat—is also a key component of Australian dietary guidelines.

It is widely believed that general overconsumption—consuming more kilojoules than are required to meet energy needs—is contributing to Australia's increase in obesity, although the extent of any overconsumption is not well documented at present.

There have been few national nutrition-related data collected in recent years in Australia, with detailed information about food and nutrient intakes last collected in 1995. However, the regular National Health Survey (NHS) collects limited information on nutrition-related behaviours, and there are also recent data available from state and territory health surveys.

Fruit and vegetable consumption

Fruit and vegetable consumption is strongly linked to the prevention of chronic disease and to better health. Inadequate fruit and vegetable consumption was estimated to be responsible for 2.1% of the total burden of disease in Australia in 2003, ranking seventh of the 14 risk factors studied (see Table 4.1), and 1.8% of the global burden of disease.

The NHMRC dietary guidelines recommend that adults consume two to four serves of fruit and four to eight serves of vegetables per day (NHMRC 2003a)—see Box 4.5 for examples of serves. However, large sections of the population do not consume these amounts. Analysis of self-reported data from the 2004–05 NHS shows that 86% of people aged 12 years or over consumed fewer than five serves of vegetables per day, and 46% consumed fewer than two serves of fruit (relates to *NHPC indicator 2.07*). The NHS data also show that younger adults tend to have lower levels of fruit and vegetable consumption than older adults.

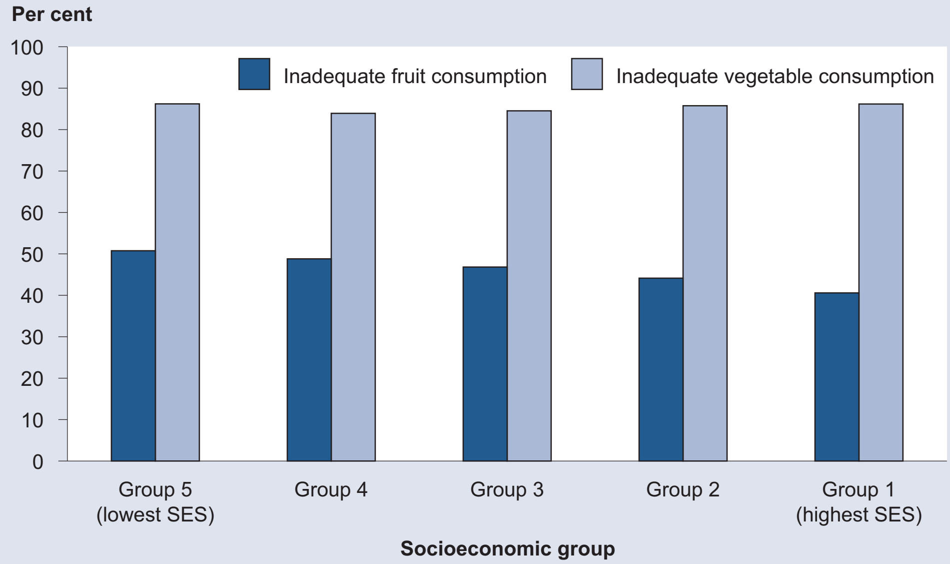
Box 4.5 How much is a serve?

By convention a serve of fruit is 150g, and a serve of vegetables is 75g. The table below sets out some examples of everyday fruit and vegetables in terms of a 'serve'.

Fruit	Vegetables
1 medium apple, orange, banana, etc.	1 medium potato, ½ medium sweet potato
2 items of small fruit such as apricots, plums, etc.	1 cup of salad vegetables
About 8 strawberries	½ cup tomatoes, capsicum, cucumber, etc.
1 cup of canned fruit	½ cup carrots, swede, turnip, etc.
½ cup of fruit juice	½ cup peas, broad beans, lentils, green beans, etc.
About 4 dried apricots, 1½ tablespoons of sultanas	½ cup spinach, cabbage, broccoli, etc.
About 20 grapes or cherries	

Source: Adapted from DOHA & NHMRC 2003.

Differences in consumption have also been noted in relation to socioeconomic status (SES) (Mishra et al. 2002), with persons from higher socioeconomic areas often found to have a healthier diet. From the NHS, it can be seen that 51% of those living in the worst-off areas ate too little fruit, compared with 41% of those in the best-off areas (Figure 4.11). In addition, a higher proportion of males ate too little fruit compared with females, across all SES groups. There was little difference in vegetable consumption across groups, with around 88% of males and 84% of females eating too few serves of vegetables.



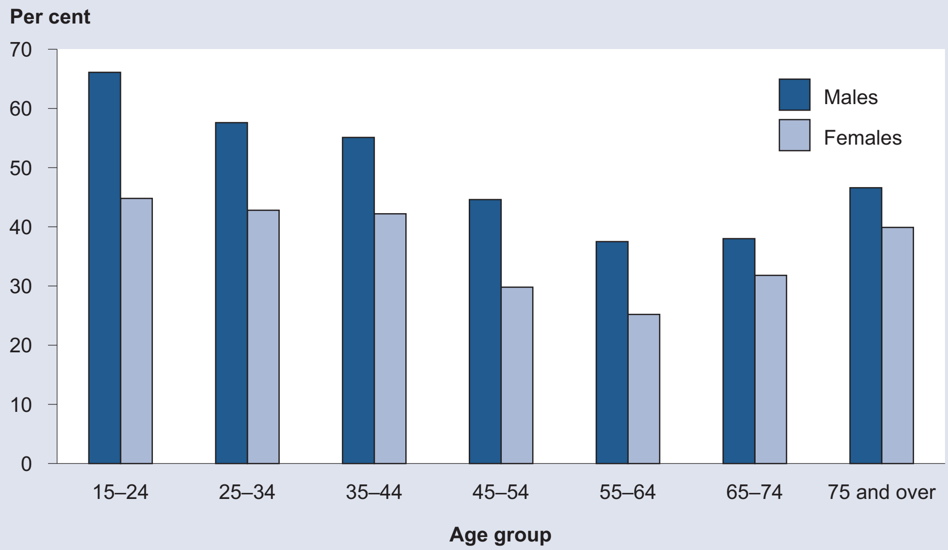
Source: AIHW analysis of the 2004–05 National Health Survey.

Figure 4.11: Inadequate consumption of fruit and vegetables, by socioeconomic status (SES), 2004–05

Saturated fat intake

Saturated fat is one of the three main types of fat, the other two being polyunsaturated and monounsaturated. It is solid at room temperature, as distinct from the other two 'oily' groups, and is mainly found in animal meats and products. A diet high in saturated fat increases the risk of coronary heart disease through its effect on raising the blood cholesterol level, notably its low-density lipoprotein component.

As dairy products contribute significantly to saturated fat intake, the proportion of people who usually consume whole ('full-cream') milk may be a useful indicator of saturated fat intake (Marks et al. 2001). Data from the 2004–05 NHS indicate that, overall, males were more likely than females to usually consume whole milk (52% compared with 39%), and that consumption of whole milk was lowest among those aged 45–74 years (Figure 4.12). In 1995, saturated fat accounted for around 13% of total energy intake by Australian adults, higher than the recommended maximum level of 10% (AIHW 2004).



Source: ABS 2006f.

Figure 4.12: Proportion consuming whole (full-cream) milk by age and sex, 2004–05

Another fat linked to an increased risk of heart disease is 'trans fat'. It is a type of unsaturated fat but it has an effect on the blood cholesterol level similar to saturated fat. It occurs naturally in very small amounts, but is also formed in commercial production of fats and is found in some margarines and processed foods. However, it is estimated that the amount in the Australian diet is quite low by international standards (FSANZ 2006).

Nutrient deficiencies

Nutrient deficiencies are a re-emerging issue in Australia. Concerns over deficiency of folate (a B vitamin) in the Australian population has led to the mandatory fortification of foods with folic acid—the synthetic form of folate used in supplements and for fortifying foods (FSANZ 2007). Folate is important for preventing spina bifida and other neural tube defects during fetal development, and the NHMRC (1994) recommends that females capable of becoming pregnant consume 400 micrograms per day of folate.

However, the 1995 National Nutrition Survey showed that only 1% of females aged 15–49 years consumed the recommended amount in their diet (excluding supplements) (Abraham & Webb 2001). Data from the 2001 NHS showed that 11% of females aged 18–49 years were deliberately increasing their intake of folate, with 7% deliberately taking vitamin or mineral supplements because they contained folic acid. Further, 6.5% of females deliberately consumed food fortified with folic acid and 2.1% deliberately consumed fortified drinks (ABS 2003a).

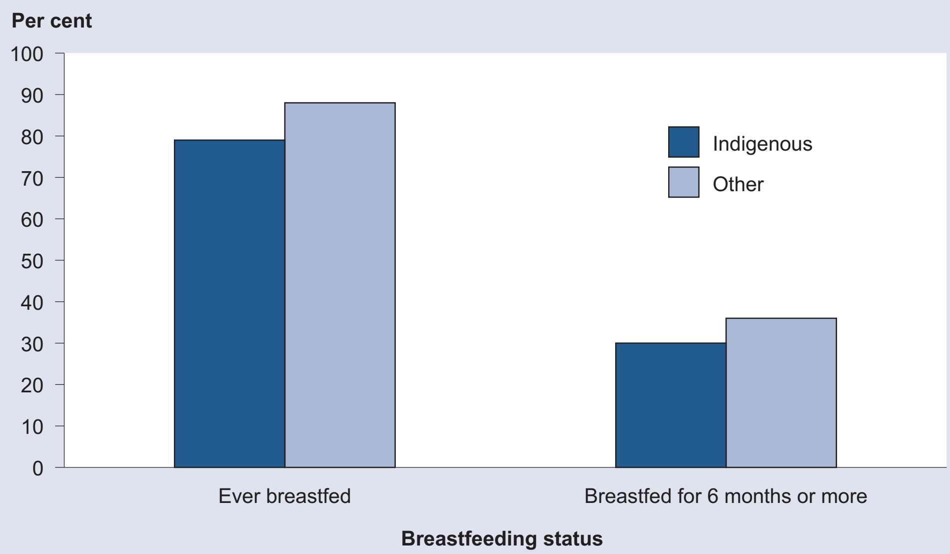
Concerns over vitamin D deficiency have also been raised recently (for example Working Group of the Australian and New Zealand Bone and Mineral Society, Endocrine Society of Australia & Osteoporosis Australia 2005). Vitamin D is obtained through the diet and also via the skin as a result of exposure to sunlight. Populations with limited sun exposure—for example, those in aged care facilities, or women whose clothes cover nearly all their body—may be at risk of deficiency (Mason & Diamond 2001), potentially leading to osteoporosis in adulthood.

Another modern nutrient deficiency concern relates to low fruit and vegetable consumption: a case of scurvy (vitamin C deficiency) was recently documented in a young Australian male who consumed almost no fruit and vegetables as part of his usual diet (Mapp & Coughlin 2006). Data from the 2004–05 NHS indicate that 7% of the population do not usually eat fruit each day, and 1% do not usually eat vegetables (ABS 2006f).

Breastfeeding

Australian recommendations for breastfeeding reflect the international recommendations of exclusive breastfeeding for the first 6 months of life, with introduction of complementary foods and continued breastfeeding from 6 months of age (NHMRC 2003b). These recommendations are based on the nutritional, health, social and economic benefits of breastfeeding. Evidence is accumulating of the protective role breastfeeding may have in several chronic diseases including Type 1 diabetes, inflammatory bowel disease and allergic diseases (NHMRC 2003b). Breastfeeding has also been seen to play an important role in helping to prevent obesity in children, attributed to physiological factors in human milk as well as feeding and parenting patterns associated with breastfeeding.

The proportion of Australian infants ever breastfed has remained fairly constant over the period 1995–2005, at around 86–88% (ABS 2003b, 2006f). However, in non-remote areas Indigenous mothers appear to be less likely to initiate and continue breastfeeding than other Australian mothers: in 2004–05, 79% of Indigenous children aged 0–3 years were reported as having ever been breastfed (including those currently breastfed) compared with 88% of other children. Similarly, 30% of Indigenous children in non-remote areas had been breastfed for 6 months or more compared with 36% of other children (Figure 4.13).



Source: ABS 2006g.

Figure 4.13: Breastfeeding status of infants aged 0–3 years in non-remote areas, 2004–05

Food security

The term 'food security' refers to the availability of healthy, affordable foods and the capacity of individuals and communities to obtain them. Food insecurity can affect nutritional status. In the 1995 and 2001 NHS surveys, around 5% of the adults (slightly more females than males) reported that there had been times in the previous 12 months when they had run out of food and could not afford to buy more (AIHW unpublished analysis of NHS data). Australians at particular risk of food insecurity include older people, those living in rural and remote areas, and those with a disability.

Sexual behaviours

Sexual activity can be associated with health risks, and unsafe sex was estimated to have been the cause of 0.6% of the burden of disease in Australia in 2003 (see Table 4.1). Unprotected intercourse can transmit infections such as chlamydia, gonorrhoea, HIV and syphilis, and can also result in unwanted pregnancies. Unprotected sexual activity has also been associated with an increased risk for specific cancers such as cervical cancer and anal cancer. The risk for these outcomes rises with increasing numbers of sexual partners.

Among the whole population, rates of sexually transmitted infections (STIs) have been generally increasing over at least the past decade. According to the National Notifiable Diseases Surveillance System, chlamydia was the most frequently reported STI in Australia in 2007, with a notification rate of 238 per 100,000 population, up from 57 in 1998.

The reporting of syphilis was changed in 2004 to differentiate new (infectious) cases from 'tertiary' ones (the chronic, non-infectious stage of the disease that can result from untreated early syphilis). Since 2004, notifications of infectious syphilis increased from 3.1 per 100,000 population to 5.7 in 2007.

The Australian Study of Health and Relationships was a telephone survey of a representative sample of males and females aged 16–59 years, conducted between May 2001 and June 2002. Those who identified as homosexuals reported a much higher lifetime number of sexual partners (males: an average 79.1 same-sex partners; females: 7.8) than did heterosexuals (males: 16.7 opposite-sex partners; females: 6.5) (de Visser et al. 2003a; Grulich et al. 2003). This means that male homosexuals are at generally increased risk of STIs.

Using surveys of homosexually active males in capital cities, the National Centre for HIV Epidemiology and Clinical Research (NCHECR 2007a) estimates that the proportion having unprotected anal intercourse with casual partners was around 20–21% in Sydney, Melbourne and Perth in 2006, although slightly higher at 23% in Brisbane and down to 15% for Adelaide and Canberra. Trends in rectal isolates of gonorrhoea among males support the reports of unprotected anal intercourse.

Among the general heterosexual population in 2002, 8% of males and 6% of females always used a condom in the past year for sexual activity with a regular partner. Substantially higher rates were observed for always using a condom with casual heterosexual partners: 45% of males and 35% of females (de Visser et al. 2003b).

Vaccination

Vaccination is the administration of a vaccine to a person to stimulate the immune system and protect against a specific infectious disease. Apart from effectively protecting the individual concerned, vaccination has a further purpose: if enough people in a population are vaccinated, the spread of infection is limited and the disease can be controlled or in some cases eliminated. This phenomenon is termed 'herd immunity'. For example, smallpox has been eliminated worldwide, allowing routine smallpox vaccination to be discontinued. Similarly, poliomyelitis has been eradicated in most parts of the world including the western Pacific region, although universal vaccination is continued because of the potential for reintroduction from areas where infection persists.

The National Health and Medical Research Council recommends a range of vaccinations for all children, older persons and others (including Indigenous Australians) who are at higher risk of contracting vaccine-preventable diseases. The Australian Government provides free vaccines for 17 vaccine-preventable diseases, and these are set out in the National Immunisation Program Schedule (NIPS).

Vaccination for children

For children, the NIPS currently covers diphtheria, tetanus, pertussis (whooping cough), polio, measles, mumps, rubella, *Haemophilus influenzae* type b (Hib), meningococcal type C disease, varicella (chickenpox), pneumococcal disease, hepatitis B, rotavirus, and, for Aboriginal and Torres Strait Islander children living in high-risk areas, hepatitis A.

To be considered fully immunised, children should have received all the vaccinations appropriate to their age. Administered vaccinations are recorded in the Australian Childhood Immunisation Register (ACIR), from which coverage rates are calculated for children aged 1, 2 and 6 years.

In December 2007, full vaccination coverage for children aged 12–15 months (as at 30 September 2007) was 91.5% nationally (Table 4.19). The coverage for individual vaccines was as high as 94.4% for *Haemophilus influenzae* type B (*NHPC indicator 3.05*). Note that the 'fully immunised' rate is lower than the rate for each of the individual vaccines, because any one child may not have yet received the full schedule of vaccinations at the time the rate was calculated. Across the country, the fully immunised rate for children of this age varied from 88.8% in Western Australia to 93.5% in Tasmania.

For children aged 24–27 months the full vaccination coverage was 93.0%, again lower than the rates for each of the individual vaccines (the highest coverage being for hepatitis B at 96.0%) (*NHPC indicator 3.05*). The fully immunised rate for this age group varied from 91.4% in Western Australia to 95.7% in Tasmania. For older children—aged 72–75 months—the full coverage was 88.8%, with virtually no difference in the rates for each vaccine.

Table 4.19: Vaccination status for children, as at December 2007 (per cent)

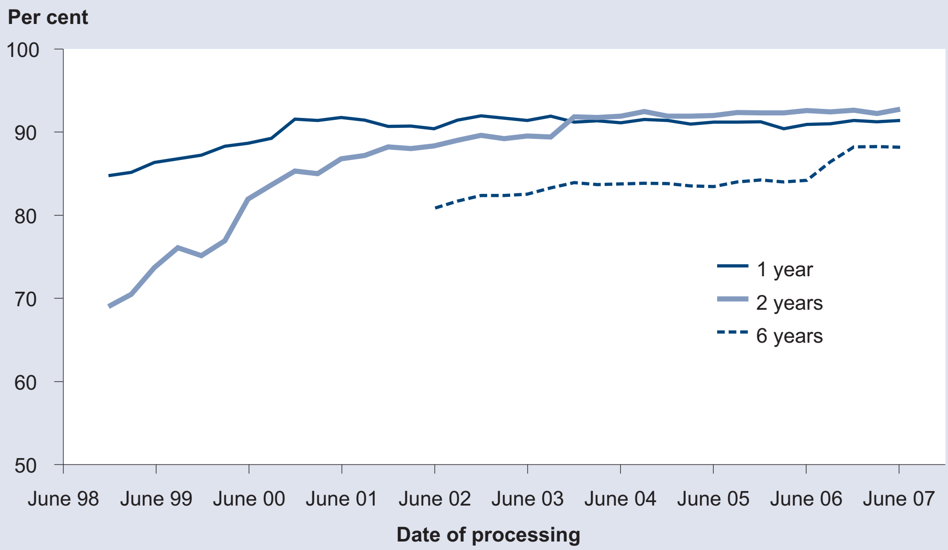
	Age in months[(a)]		
Measure	**12–15**	**24–27**	**72–75**
Diphtheria, tetanus and pertussis	92.1	95.3	89.4
Poliomyelitis	92.1	95.2	89.5
Haemophilus influenzae type B	94.4	94.8	. .
Hepatitis B	94.4	96.0	. .
Measles, mumps and rubella	. .	94.2	88.7
Fully immunised	**91.5**	**93.0**	**88.8**

(a) Age as at 30 September 2007.

Source: Medicare Australia 2008.

After the introduction of the ACIR over 10 years ago, reported vaccination rates for younger children rose for the first few years, but have recently been stable (Figure 4.14). Reporting of rates for 6 year olds began in 2002, seeing coverage climb from around 81% then, up to 88% in June 2007.

The spike in coverage for 2 year olds in 2003 was due to the removal from the schedule of the 4th dose of diphtheria-tetanus-pertussis vaccination (due at 18 months) from the December 2003 quarter onwards, such that only three vaccinations are now used in the coverage assessment. Similarly for 6 year olds, from June 2006 the introduction of a combination vaccine onto the schedule reduced the number of vaccines to be recorded from three to two.



Source: Data from the Australian Childhood Immunisation Register.

Figure 4.14: Vaccination status for children, 1998–2007

Human papillomavirus vaccination for girls and young women

From 2007 the Australian Government is funding the purchase of human papillomavirus (HPV) vaccine to be provided to girls and young women. The vaccine is delivered as a course of three injections over 6 months and protects against the strains of HPV that cause 7 out of 10 cervical cancers and 9 out of 10 cases of genital warts.

By the end of 2008, all girls currently aged 12–18 years will have had access to the vaccine in school. For young women who are not in school and aged under 27 years, GPs and community immunisation clinics will provide the free vaccine until the end of June 2009, as a 'catch-up' program.

The vaccine is not approved for use in women aged over 26 years, and all those vaccinated will still need to have regular Pap smears to ensure that any cervical abnormalities are detected early.

Influenza and pneumococcal vaccination for adults

Vaccination against influenza and pneumococcal infection (which typically causes pneumonia) is available in Australia and is free for all Indigenous Australians aged 50 years and over, for all others aged 65 years and over, and for Indigenous Australians aged 15–49 years in high-risk groups.

A national telephone survey on adult vaccination in 2006 showed that 77.5% of Australians aged 65 years and over were vaccinated against influenza in 2006 (*NHPC indicator 3.06*). This is the highest vaccination coverage of all OECD countries, and a marked increase from 61% in 1998. When the vaccination status of aged care residents was taken into account, the estimated coverage for 2006 lifted slightly to 78.0%.

For pneumococcal disease, the estimated vaccination coverage of Australians aged 65 years and over in 2006 was 62.2%, compared with 51.1% in 2004. More of this target group may have been vaccinated, but the currency of their vaccination could not be fully determined from the survey.

4.6 Biomedical factors

As distinct from behaviours and other determinants discussed earlier in this chapter, biomedical factors represent actual bodily states. Factors such as high blood pressure and high blood cholesterol, for example, can therefore be regarded as relatively 'downstream' in the process of causing ill health. They carry comparatively direct and specific risks for health. They are often influenced by behavioural factors which are in turn influenced by socioeconomic factors and other 'upstream' determinants.

Health behaviours tend to interact with each other and influence a variety of biomedical factors. Both physical activity and diet, for example, can affect body weight, blood pressure and blood cholesterol. They can each do this independently, or, with greater effect, they can act together. Further, behavioural and biomedical risk factors tend to increase each other's effects when they occur together in an individual.

Note that several of the biomedical risk factors discussed here are often highly interrelated in causing disease. Excess body weight, high blood pressure and high blood cholesterol, for example, can all contribute to the risk of heart disease and amplify each other's effects if they occur together. In addition, obesity can in itself contribute to high blood pressure and high blood cholesterol.

Similarly, Type 2 diabetes is often regarded as a biomedical risk factor, as it is essentially defined by an abnormal biomedical process (see the section on impaired glucose regulation later in this chapter), and because an individual with diabetes is more at risk of other diseases, particularly cardiovascular disease (Diabetes Australia 2006a). Diabetes is discussed in more detail in Chapter 5.

Blood pressure

High blood pressure (often referred to as hypertension; see Box 4.6) is a major risk factor for coronary heart disease, stroke, heart failure and kidney failure. When high blood pressure is controlled, the risk of cardiovascular disease and overall mortality is reduced, but not necessarily to the levels of unaffected people (WHO–ISH 1999).

Nearly 8% of the burden of disease in Australia in 2003 can be attributed to high blood pressure. It ranks as a close second to tobacco use on this score, with coronary heart disease and stroke accounting for 93% of the burden of high blood pressure. Four-fifths of the burden of high blood pressure was considered to be due to premature death and the remainder to disability.

Major causes of high blood pressure include diet (particularly a high salt intake), obesity, excessive alcohol consumption, and insufficient physical activity. Attention to health determinants such as body weight, physical activity and nutrition plays an important role in maintaining healthy blood pressure.

Box 4.6: High blood pressure

Blood pressure represents the forces exerted by blood on the wall of the arteries and is written as systolic/diastolic (for example 120/80 mmHg, stated as '120 over 80'). Systolic blood pressure reflects the maximum pressure in the arteries when the heart muscle contracts to pump blood. Diastolic blood pressure reflects the minimum pressure in the arteries when the heart muscle relaxes before its next contraction.

There is a continuous relationship between blood pressure levels and cardiovascular disease risk. This makes the definition of high blood pressure somewhat arbitrary. The World Health Organization defines high blood pressure as:

- systolic blood pressure of 140 mmHg or more; or
- diastolic blood pressure of 90 mmHg or more; or
- receiving medication for high blood pressure.

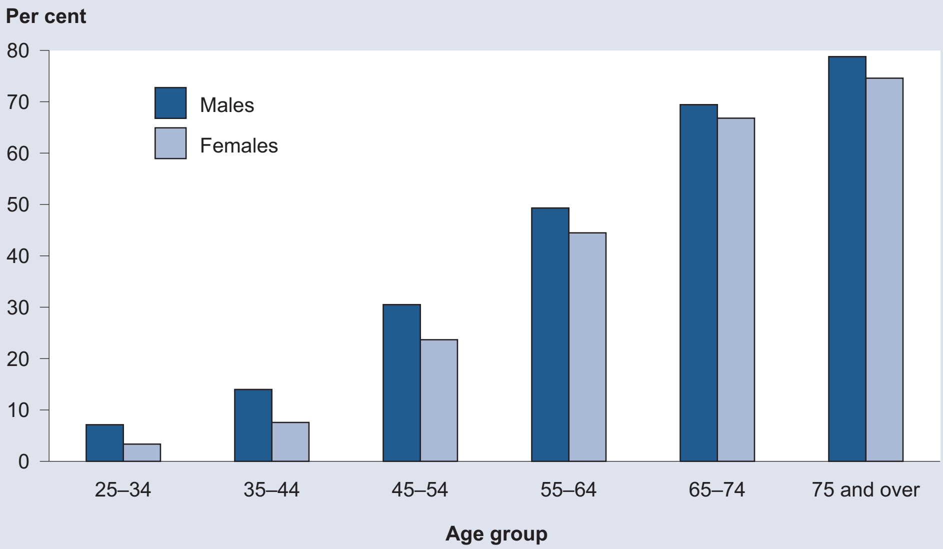
In this report high blood pressure is defined using these guidelines.

Source: WHO–ISH 2003.

Despite the definition of high blood pressure in Box 4.6, there is in fact no threshold level of risk. Starting from quite low levels, as blood pressure increases so does the risk of stroke, heart attack and heart failure. Elevated levels of systolic and diastolic blood pressure are each predictors of cardiovascular disease.

Prevalence of high blood pressure

The 1999–2000 Australian Diabetes, Obesity and Lifestyle Study (AusDiab study) measured people's blood pressure and the results indicated that 30% of Australians aged 25 years and over (3.7 million) had high systolic or diastolic blood pressure or were on medication for high blood pressure—32% of males and 27% of females (relates to *NHPC indicator 2.11*). The proportion of males and females with high blood pressure increased markedly with age (Figure 4.15).



Note: Based on WHO definition of high blood pressure (Box 4.5).

Source: AIHW analysis of 1999–2000 AusDiab study.

Figure 4.15: Proportion of adults with high blood pressure, 1999–2000

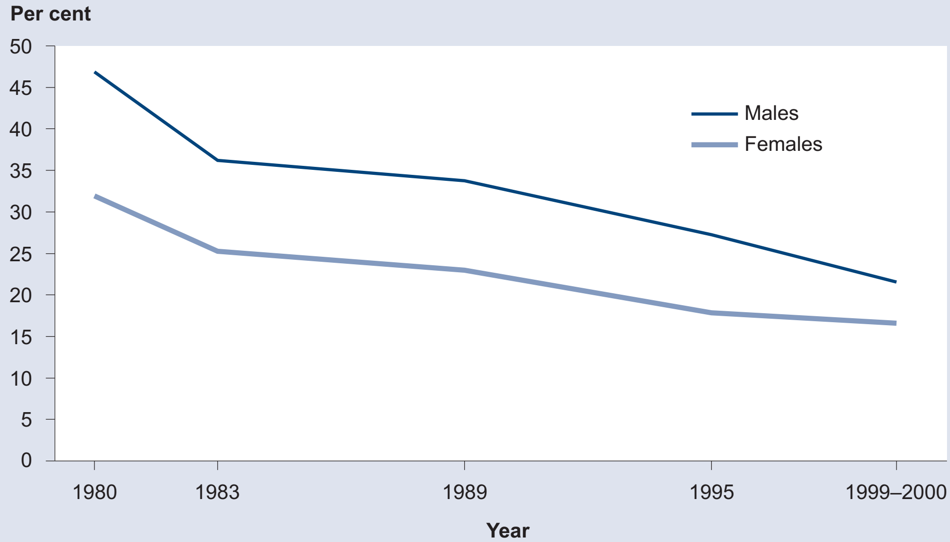
Trends

Between 1995 and 1999–2000 the prevalence of measured high blood pressure among Australians aged 25 years and over remained about the same—31% in 1995 and 30% in 1999–2000. However, looking at just the urban population aged 25–64 years—the population for which longer term trends are available—the prevalence of high blood pressure has decreased appreciably since 1980 for both males and females (Figure 4.16). The proportion of males aged 25–64 years with high blood pressure more than halved, from 47% in 1980 to 21% in 1999–2000. It correspondingly halved for females, from 32% to 16%.

It is important to note that average blood pressure also decreased in this particular group over this period. Average systolic blood pressure decreased from 134 to 128 mmHg for males, and from 127 to 121 mmHg for females. Average diastolic blood pressure decreased from 85 to 74 mmHg for males, and from 79 to 68 mmHg for females (AIHW 2004).

Aboriginal and Torres Strait Islander peoples

There have been no national surveys that directly measured blood pressure among Aboriginal and Torres Strait Islander peoples. However, from self-reported data collected in the 2004–05 National Aboriginal and Torres Strait Islander Health Survey, 7% of Indigenous Australians overall, and 22% of those aged 35 years and over, had high blood pressure as a long-term condition. After adjusting for differences in the age structure of the Indigenous and non-Indigenous populations, high blood pressure was 60% more prevalent among Indigenous Australians than among other Australians (AIHW: Penm 2007). Indigenous people also reported high blood pressure from a younger age than other Australians.



Notes

1. Age-standardised to the 2001 Australian population.
2. People aged 25–64 years, in urban areas only.
3. Based on WHO definition of high blood pressure (Box 4.5).

Sources: AIHW analysis of 1980, 1983, 1989 Risk Factor Prevalence Surveys; 1995 National Nutrition Survey; 1999–2000 AusDiab study.

Figure 4.16: Proportion of adults with high blood pressure, 1980 to 1999–2000

Blood cholesterol

High blood cholesterol (see Box 4.7) is a major risk factor for coronary heart disease and ischaemic stroke. It is a basic cause of plaque, the process by which the blood vessels that supply the heart and certain other parts of the body become clogged.

Box 4.7: High blood fats—cholesterol and triglyceride

Cholesterol is a fatty substance produced by the liver and carried by the blood to the rest of the body. Its natural function is to provide material for cell walls and for steroid hormones. If levels in the blood are too high, this can lead to artery-clogging plaques that can bring on heart attacks, angina or stroke. The risk of heart disease increases steadily from a low base with increasing blood cholesterol levels. A total cholesterol level of 5.5 mmol/L or more is considered 'high' but this is an arbitrary definition.

Two important parts of blood cholesterol are:

- low-density lipoprotein (LDL) cholesterol, often known as 'bad' cholesterol. Excess levels of LDL cholesterol are the main way that cholesterol contributes to plaque.
- high-density lipoprotein (HDL) cholesterol, often known as 'good' cholesterol. High levels have a protective effect against heart disease by helping to reduce plaque.

Triglyceride is another form of fat that is made by the body. Its levels can fluctuate according to dietary fat intake and under some conditions excess levels may contribute to plaque.

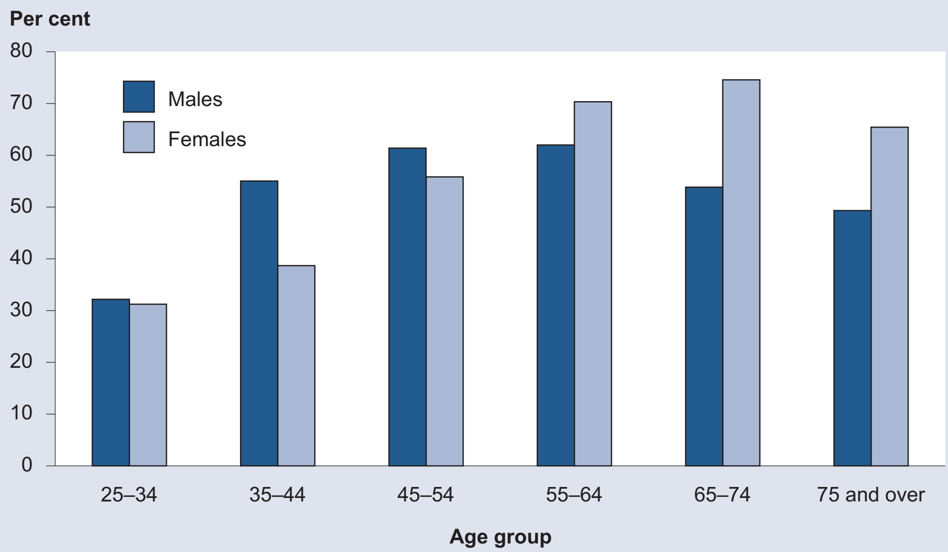
In this report, levels of high blood cholesterol are based on a total cholesterol level of 5.5 mmol/L or more.

High blood cholesterol was estimated to have caused about 6% of the total burden of disease among Australians in 2003 (Table 4.1), with coronary heart disease and stroke accounting for the whole of cholesterol's burden. About 80% of this burden was considered to be due to deaths and 20% to disability.

For most people, saturated fat in the diet is the main factor that raises blood cholesterol levels. Genetic factors can also affect blood cholesterol levels, severely in some individuals. Attention to health risk factors such as physical activity and diet plays an important role in maintaining a healthy blood cholesterol level. Some societies have much lower average cholesterol levels than Australia, with a correspondingly lower rate of cardiovascular disease.

Average blood cholesterol and prevalence of high blood cholesterol

The 1999–2000 AusDiab study estimated that around half those aged 25 years and over in 1999–2000 had levels of 5.5 mmol/L or more, corresponding to nearly 6.5 million Australians with high cholesterol. The prevalence of high blood cholesterol increased with age to a peak for females aged 65–74 years and for males aged 55–64 years (Figure 4.17).



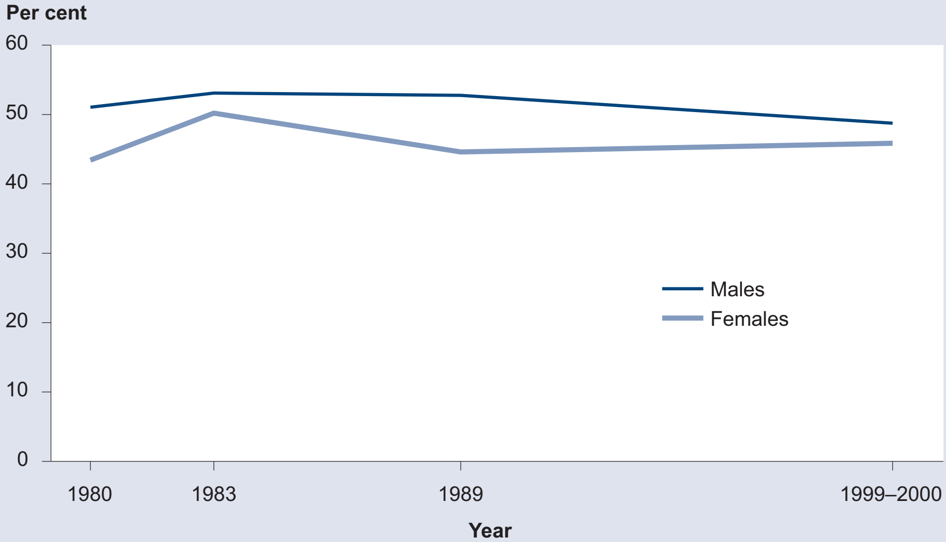
Note: High blood cholesterol is a total cholesterol level of 5.5 mmol/L or more.

Source: AIHW analysis of 1999–2000 AusDiab study.

Figure 4.17: Proportion of adults with high blood cholesterol, 1999–2000

Trends

Data on trends in average blood cholesterol and high blood cholesterol prevalence are available only to the year 2000 and for people aged 25–64 years living in capital cities. Average blood cholesterol levels of adults in 1999–2000 were very similar to those 20 years earlier. Consistent with the trends in average levels, there was no apparent reduction in the prevalence of people with high blood cholesterol over that period (Figure 4.18).



Notes

1. Age-standardised to the 2001 Australian population.
2. People aged 25–64 years in capital cities only.
3. High blood cholesterol is a total cholesterol level of 5.5 mmol/L or more.

Source: AIHW analysis of 1980, 1983 and 1989 Risk Factor Prevalence surveys and 1999–2000 AusDiab study.

Figure 4.18: Proportion of adults with high blood cholesterol, 1980 to 1999–2000

Body weight

Current concerns about body weight centre on overweight and obesity, because of the significant rise in prevalence in Australia over the past 20–30 years. The dramatic increase in obesity worldwide over this period has resulted in the WHO labelling it a global epidemic. Excess body fat increases the risk of developing a range of health problems, including Type 2 diabetes, cardiovascular disease, high blood pressure, certain cancers, sleep apnoea, osteoarthritis, psychological disorders and social problems (WHO 2000).

At the other end of the weight spectrum, underweight is associated with malnutrition and poor health. Although underweight is mainly a problem in developing countries, disordered eating—for example, anorexia and bulimia—among people in the developed world also results in poor health. This discussion focuses on overweight and obesity, because of the large scale of such conditions for Australia (see Box 4.8 for more information on classifying body weight).

High body weight—also referred to as high body mass—was estimated to be responsible for 7.6% of the total burden of disease in Australia in 2003, placing it a close third behind tobacco smoking and high blood pressure (Begg et al. 2007). In addition, there is likely to be strong growth in the level of diabetes over the next 20 years, mostly as a direct result of increasing levels of obesity. Access Economics (2006) estimated that the total financial cost of obesity in Australia in 2005 was nearly $4 billion, or about 0.4% of gross domestic product.

Box 4.8: Classifying body weight

Body mass index (BMI) and waist circumference are the two main methods used for monitoring body weight. The most common measure used is the BMI (particularly in self-report surveys), as people are more likely to know their height and weight than their waist circumference. The BMI is calculated by dividing weight in kilograms by the square of height in metres (kg/m^2).

The standard recommended by the World Health Organization for adults aged 18 years and over is based on the association between BMI and illness and mortality (WHO 2000):

- underweight: BMI < 18.5
- healthy weight: BMI ≥ 18.5 and BMI < 25
- overweight but not obese: BMI ≥ 25 and BMI < 30
- obese BMI ≥ 30.

This classification may not be suitable for all ethnic groups and it is not suitable for children. Compared with the rest of the population, some groups may have equivalent levels of risk at lower BMI (for example Asians) or higher BMI (for example Polynesians). For children and adolescents aged 2–17 years, Cole et al. (2000) have developed a separate classification of overweight and obesity based on age and sex.

Waist circumferences of 94 cm or more in males and 80 cm or more in females indicate increased risk (referred to here as abdominal overweight). Waist circumferences of 102 cm or more in males and 88 cm or more in females indicate substantially increased risk (referred to here as abdominal obesity). This classification is not suitable for use in people aged less than 18 years and the cut-off points may not be suitable for all ethnic groups.

Height and weight data may be collected in surveys as measured or self-reported data. People tend to overestimate their height and underestimate their weight, leading to an underestimate of BMI. Thus, rates of overweight and obesity based on self-reported data are likely to be underestimates of the true rates, and should not be directly compared with rates based on measured data.

Data from the 2004–05 National Health Survey (NHS) indicate that the 'average' Australian aged 25 years or over is overweight, using average weight and height for each age group. Males aged 45–64 years have the highest average BMI, with a weight loss of 8 kg required to bring them into the 'healthy' BMI category. Persons aged 75 years and over have the least weight to lose, with a loss of 0.4 kg enough to bring them into the healthy category.

Overweight and obesity arises through an energy imbalance over a sustained period. Although many factors may influence a person's weight, weight gain is essentially due to the energy intake from the diet being greater than the energy expended through physical activity. The sustained energy imbalance need only be minor for weight gain to occur, and some people—because of genetic and biological factors—may be more likely to gain weight than others (WHO 2000). For related information, see the sections on dietary behaviour and physical activity in this chapter.

Although the evidence remains strong that obesity is a risk factor for ill health, including overall mortality, there is some debate about the contribution of lesser degrees of overweight to mortality rates. A recent study showed that obesity and underweight, but not overweight, resulted in higher mortality rates in the United States, and that the impact of obesity on mortality may have decreased over time, perhaps because of improvements in public health and medical care (Flegal et al. 2005).

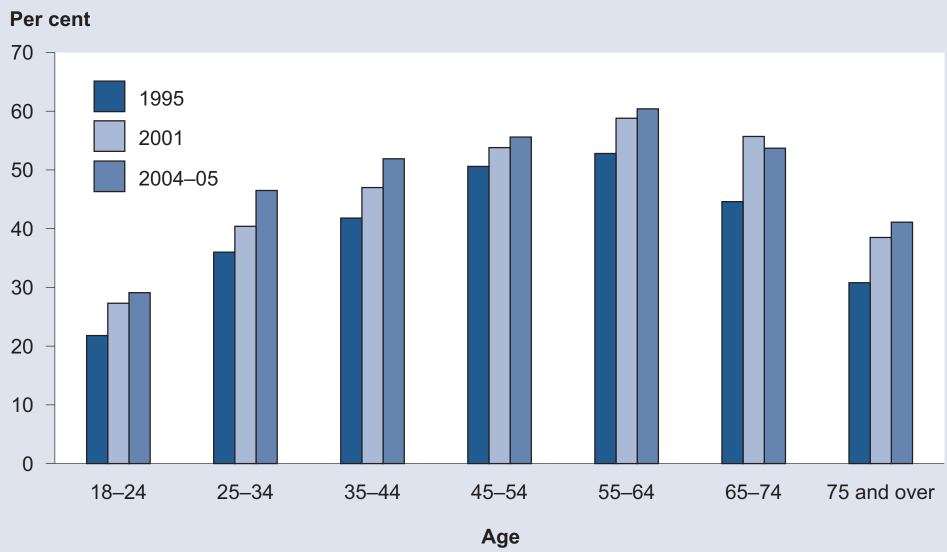
Prevalence and trends

In Australia, the prevalence of overweight and obesity has been increasing over at least the past 20–30 years. National data are available from a number of surveys, using either a BMI derived from self-reported or measured height and weight, or using waist circumference (see Box 4.8).

About half of Australian adults are overweight or obese according to the 2004–05 NHS, which provides the most recent national data and records self-reported height and weight. From this survey, an estimated 2.5 million Australian adults were obese (19% of males and 17% of females aged 18 years and over). A further 4.9 million Australian adults were estimated to be overweight but not obese (41% of males and 25% of females aged 18 years and over) (*NHPC indicator 2.09*). Among adults, 1% of males and 4% of females were estimated to be underweight. The highest rates of obesity were seen among males aged 45–54 years (23.2%) and females aged 55–64 years (21.7%) (ABS 2006f).

The prevalence of overweight and obesity has increased across all age groups from 1995 to 2004–05. The most marked increases were among those aged 25–44 years and 75 years and over, where rates increased by over 10 percentage points over that period (Figure 4.19).

This general trend is confirmed by the Bettering the Evaluation and Care of Health (BEACH) study, which shows that among adult patients attending general practice there has been a steady increase in the prevalence of overweight and obesity, from 51.1% in 1998–99 to 58.5% in 2006–07 (Britt et al. 2008).



Source: ABS 2006f.

Figure 4.19: Trends in overweight and obesity prevalence, by age

Prevalence based on measured data

Measured height and weight were last collected nationally in the 1999–2000 AusDiab study. Analysis of this survey found that 19% of males and 22% of females aged 25 years and over were obese and an additional 48% of males and 30% of females were overweight but not obese. The prevalence of underweight was less than 1% for males and nearly 2% for females. Overall, males were more likely than females to be overweight or obese (67% versus 52%). Among adults, the prevalence of obesity was highest among those aged 55–64 years (29%), with the lowest rates being among those aged 25–34 years (15%) or 75 years and over (14%). A similar pattern was seen for people who were overweight (but not obese), with the prevalence increasing with age to 65–74 years and declining thereafter.

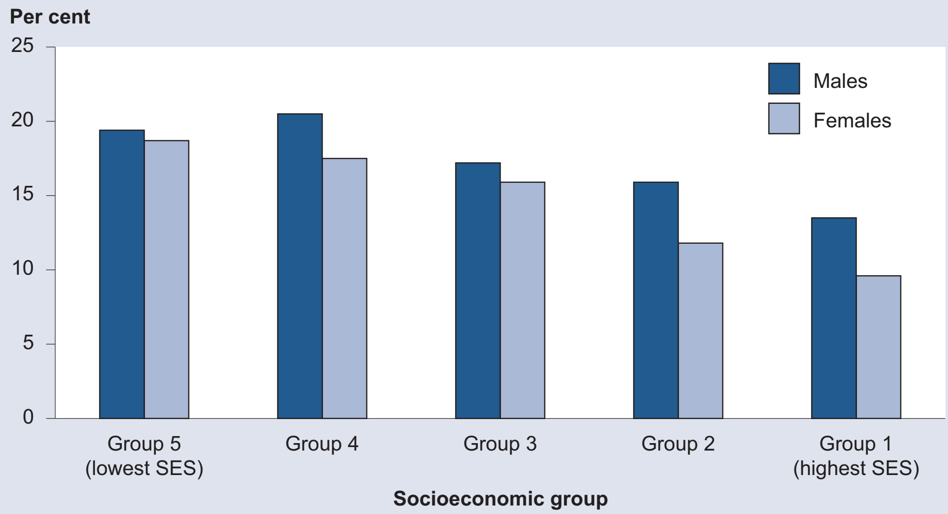
Waist circumference is also a useful indicator of abdominal obesity, which is an independent risk factor for Type 2 diabetes, coronary heart disease and other health disorders (WHO 2000). In 1999–2000, data from the AusDiab study showed that more than a quarter of males (27%) and over a third of females (34%) aged 25 years and over were abdominally obese.

Older Australians

Excess weight in older age has been seen to impair mobility, participation in social activities and quality of life (Villareal et al. 2005). It has been estimated that Australian males aged 30–34 years in 1980 gained over 8 kg as they aged to 50–54 years in 2000, and similarly females gained 12 kg over the same period (AIHW: Bennett et al. 2004). Underweight in older people also appears to be associated with impaired physical, social and mental wellbeing (Yan et al. 2004).

Socioeconomic status

Results from the 2004–05 NHS for adults aged 18 years and over show that people in the most socioeconomically disadvantaged fifth of the population had the highest rates of overweight and obesity. For them, 50% were overweight or obese, compared with 45% of adults in the best-off fifth of the population (ABS 2006f). The gradient is more marked when considering obesity alone. Based on self-reports, adults in the highest socioeconomic fifth were least likely to be obese: 9.6% of females and 13.5% of males (Figure 4.20). In comparison, 18.7% of females and 19.4% of males in the lowest socioeconomic fifth were obese.



Source: AIHW analysis of the 2004–05 National Health Survey.

Figure 4.20: Prevalence of obesity (BMI of 30 or more) by sex and socioeconomic status (SES)

Aboriginal and Torres Strait Islander peoples

Data from the 2004–05 National Aboriginal and Torres Strait Islander Health Survey show that 28% of Indigenous Australians aged 15 years and over were overweight and a further 29% were obese (ABS 2006g). After adjusting for differences in the age structures of the Indigenous and non-Indigenous populations, Indigenous Australians were just as likely as other Australians to be overweight (but not obese), and almost twice as likely to be obese.

International comparisons

Based on an analysis by the World Health Organization (WHO 2005), the prevalence of obesity among males and females 15 years and over in Australia (24% and 25%) is much lower than that in the United States of America (37% and 42%). However, it is similar to that in Canada (24% and 23%) and the United Kingdom (22% and 24%), and considerably higher than that in France (8% and 7%) and Japan (2%).

Impaired glucose regulation

Impaired glucose regulation is the metabolic state between normal glucose regulation and the failed regulation known as diabetes (WHO 1999). There are two categories of impaired glucose regulation: impaired fasting glucose (IFG) and impaired glucose tolerance (IGT) (see Box 4.9). IFG and IGT are not considered to be clinical entities in their own right but rather risk factors for the future development of diabetes and cardiovascular disease (NHMRC 2001b; Dunstan et al. 2001). Studies have found that about 60% of people who developed diabetes had either IGT or IFG five years before they were diagnosed with diabetes (Unwin et al. 2002).

Box 4.9: Defining impaired glucose regulation

Impaired fasting glucose (IFG) and impaired glucose tolerance (IGT) are measured using an oral glucose tolerance test (OGTT)—the same test that is used to assess for diabetes. In the OGTT a blood glucose measurement is taken after a period of about 8 hours of fasting; then an additional measurement is taken 2 hours after consuming 75 g of glucose (typically in the form of a high-sugar drink).

IFG is diagnosed when the OGTT results show that the fasting blood glucose level (that is, the first measurement) is 6.0 mmol/L or more but less than 7.0 mmol/L, and the blood glucose level 2 hours after consuming the glucose is less than 7.8 mmol/L. This means that the fasting blood glucose level is higher than normal but the level does not rise abnormally after taking 75 g of glucose (Diabetes Australia 2006).

IGT is diagnosed when the OGTT results show that the fasting blood glucose level is less than 7.0 mmol/L and the blood glucose level 2 hours after consuming the glucose is more than 7.8 mmol/L but less than 11 mmol/L.

(Note that diabetes—rather than just impaired glucose regulation—is diagnosed when the fasting blood glucose level is 7.0 mmol/L or more, or the OGTT result is 11.1 mmol/L or more, or both.)

Risk and prevention

Impaired glucose regulation is most common in people who also have other risk factors for diabetes or cardiovascular disease, including being overweight or obese, being physically inactive, and having high levels of triglycerides, low HDL cholesterol, high total cholesterol or high blood pressure. Preventing these risk factors, as well as early treatment and improved management of impaired glucose regulation, can reduce the progression to Type 2 diabetes. Results from a follow-up study by Tuomilehto et al. (2001) showed that lifestyle interventions among obese adults with IGT—such as counselling aimed at reducing weight and total fat intake, increasing fibre intake, and physical activity—reduced the rate of progression to diabetes by 40–60% over a 3–6 year period.

How many Australians have impaired glucose regulation?

Based on measured data from the 1999–2000 AusDiab study, it is estimated that about one in six Australians aged 25 years or over had impaired glucose regulation, with IGT more prevalent than IFG (11% and 6% respectively) (Table 4.20).

A comparison of results from the 1981 Busselton Study and 1999–2000 AusDiab study indicated a large increase for both males (from 3% to 10%) and females (from 3% to 12%) in the age-standardised prevalence of IGT over the 20-year period (Dunstan et al. 2001).

Table 4.20: Prevalence of impaired glucose regulation among adults aged 25 years and over, 1999–2000 (per cent)

Measure	Males	Females	Persons
Impaired glucose tolerance	9.2	11.9	10.6
Impaired fasting glucose	8.1	3.4	5.8
Total impaired glucose regulation	**17.4**	**15.4**	**16.4**

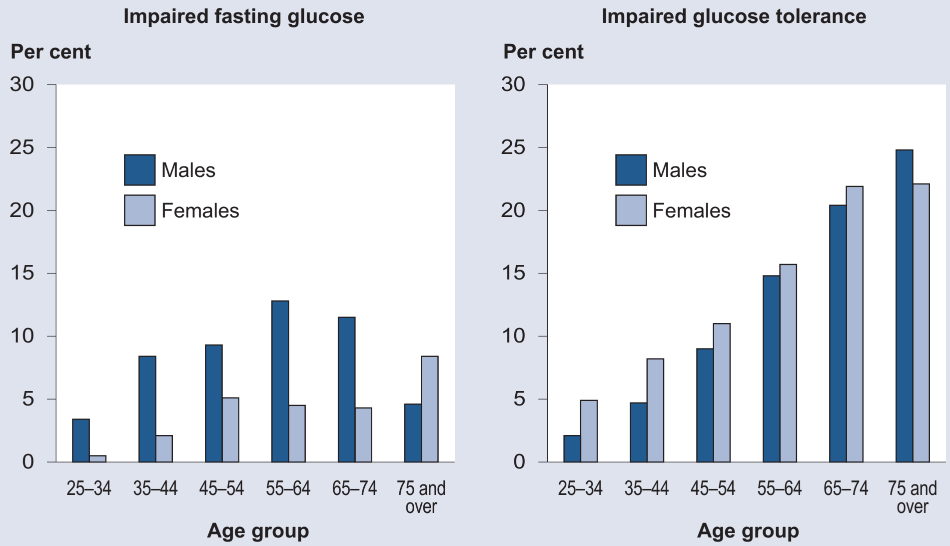
Source: AIHW analysis of the 1999–2000 AusDiab study.

Variations with sex and age

The prevalence and type of impaired glucose regulation vary with sex and age. For example, the 1999–2000 AusDiab study found that the overall prevalence of IFG was significantly higher in males than females (8% compared with 3%) (Table 4.20). This pattern is consistent with results of other studies which report IFG prevalence as being 1.5 to 3 times as high in males as in females (DECODE Study Group 2003; DECODA Study Group 2003).

The age-specific prevalence of IFG indicates that, compared with females, males had higher rates of IFG at all ages except 75 years and over, at which point the female prevalence exceeded that of males. The prevalence of IFG is highest for males aged 55–64 years and for females aged 75 years and over (Figure 4.21).

In contrast, among those aged 25–74 years, the prevalence of IGT was higher in females than in males (12% compared with 9%). From age 75 years and over the prevalence of IGT was higher for males than for females. Unlike the distribution of IFG by age, the prevalence of IGT increased steadily with increasing age for both sexes.



Source: AIHW analysis of the 1999–2000 AusDiab Study.

Figure 4.21: Prevalence of impaired fasting glucose and impaired glucose tolerance among adults aged 25 years and over, by age group and sex, 1999–2000

References

Abelson P 2006. The cost of foodborne illness in Australia. Canberra: Australian Government Department of Health and Ageing.

Abraham B & Webb K 2001. Interim evaluation of the voluntary folate fortification policy. Canberra: Department of Health and Aged Care.

ABS (Australian Bureau of Statistics) 1997. 1996 Census data: Australia. Basic community profile—Australia: B24 family type by weekly family income. Canberra: ABS. Viewed 27 June 2007, <www.abs.gov.au>.

ABS 2002. Housing and infrastructure in Aboriginal and Torres Strait Islander communities, 2001. ABS cat. No. 4710.0. Canberra: ABS.

ABS 2003a. Measuring dietary habits in the 2001 National Health Survey, Australia. ABS cat. no. 4814.0.55.001. Canberra: ABS.

ABS 2003b. Breastfeeding in Australia. ABS cat. no. 4810.0.55.001. Canberra: ABS.

ABS 2005. Environmental issues: people's views and practices. ABS cat. no. 4602.0. Canberra: ABS.

ABS 2006a. Personal safety, Australia, 2005. ABS cat. no. 4906.0. Canberra: ABS.

ABS 2006b. Crime and safety, Australia, 2005. ABS cat. no. 4509.0. Canberra: ABS.

ABS 2006c. Education and work, Australia, May 2006. ABS cat. no. 6227.0. Canberra: ABS.

ABS 2006d. Household Expenditure Survey and Survey of Income and Housing user guide, Australia, 2003–04. ABS cat. no. 6503.0. Canberra: ABS.

ABS 2006e. Household wealth and wealth distribution, Australia, 2003–04. ABS cat. no. 6554.0. Canberra: ABS.

ABS 2006f. National Health Survey: summary of results, Australia 2004–05. ABS cat. no. 4364.0. Canberra: ABS.

ABS 2006g. National Aboriginal and Torres Strait Islander Health Survey 2004–05, Australia. ABS cat no. 4715.0. Canberra: ABS.

ABS 2007a. General Social Survey: summary results, Australia, 2006. ABS cat. no. 4159.0. Canberra: ABS.

ABS 2007b. Housing infrastructure in Aboriginal and Torres Strait Islander communities, 2006. ABS cat. no. 4710.0. Canberra: ABS.

ABS 2007c. Schools, Australia. Various years. ABS cat. no. 4221.0. Canberra: ABS.

ABS 2007d. Household income and income distribution, Australia, 2005–06. ABS cat. no. 6523.0. Canberra: ABS.

ABS 2007e. Labour force, Australia, detailed—electronic delivery, June 2007. ABS cat. no. 6291.0.55.001. Canberra: ABS.

ABS 2007f. Labour force, Australia, detailed, quarterly, August 2007. ABS cat. no. 6291.0.55.003. Canberra: ABS.

ABS 2007g. 2006 Census tables: Australia. Family composition—Australia. ABS cat. no. 2068.0. Canberra: ABS.

ABS 2007h. Participation in sports and physical recreation, 2005–06. ABS cat no. 4177.0.

Access Economics 2006. The economic costs of obesity: report prepared for Diabetes Australia. Canberra: Access Economics.

AIHW (Australian Institute of Health and Welfare) 2004. Heart, stroke and vascular diseases—Australian facts 2004. Cat. no. CVD 27. Canberra: AIHW and National Heart Foundation of Australia.

AIHW 2005. 2004 National Drug Strategy Household Survey: first results. Cat. no. PHE 57. Drug statistics series no. 13. Canberra: AIHW.

AIHW 2006. Australia's health 2006. Cat. no. AUS 73. Canberra: AIHW.

AIHW 2007. Australia's welfare 2007. Cat. no. AUS 93. Canberra: AIHW.

AIHW: Australian Centre for Asthma Monitoring 2003. Asthma in Australia 2003. Cat. no. ACM 1. Asthma series no. 1. Canberra: AIHW.

AIHW: Bennett S, Magnus P & Gibson D 2004. Obesity trends in older Australians. Cat. no. AUS 42. Bulletin no. 12. Canberra: AIHW.

AIHW: Mathers C 1994. Health differentials among adult Australians aged 25–64 years. Cat. no. PHE 17. Health monitoring series no. 1. Canberra: AGPS.

AIHW: Mathers C 1995. Health differentials among Australian children. AIHW Health monitoring series no. 3. Canberra: AGPS.

AIHW: Penm E 2008. Cardiovascular disease and its associated risk factors in Aboriginal and Torres Strait Islander peoples. Cat. no. CVD 41. Cardiovascular disease series no. 29. Canberra: AIHW.

Armfield JM 2006. The extent of water fluoridation coverage in Australia. Australian and New Zealand Journal of Public Health 30(6):581–2.

Bauman A, Bellew B, Vita P, Brown W & Owen N 2002. Getting Australia active: towards better practice for the promotion of physical activity. Melbourne: National Public Health Partnership.

Beeton RJS, Buckley KI, Jones GJ, Morgan D, Reichelt R & Trewin D 2006. Australia state of the environment 2006, Independent report to the Australian Government Minister for the Environment and Heritage. Canberra: Department of Environment and Heritage.

Begg S, Vos T, Barker B, Stevenson C, Stanley L & Lopez AD 2007. The burden of disease and injury in Australia 2003. Cat. no. PHE 82. Canberra: AIHW.

Booth M, Okely AD, Denney-Wilson E, Yang B, Hardy L & Dobbins T 2006. NSW schools physical activity and nutrition survey (SPANS) 2004. Sydney: NSW Department of Health.

Britt H, Miller GC, Charles J, Bayram C, Pan Y et al. 2008. General practice activity in Australia 2006–07. Cat. no. GEP 21. General Practice Series no. 21. Canberra: AIHW.

BTRE (Bureau of Transport and Regional Economics) 2005. Health impacts of transport emissions in Australia: economic costs. Working Paper 63. Canberra: BTRE.

Bunker S, Colquhoun D, Esler E et al. 2003. 'Stress' and coronary heart disease: psychosocial risk factors. National Heart Foundation of Australia position statement update. Medical Journal of Australia 178:272–6.

Bureau of Meteorology 2006. Annual Australian climate summary 2005. Viewed 30 July 2007, <www.bom.gov.au>.

Bureau of Meteorology 2007. Annual Australian climate summary 2006. Viewed 30 July 2007, <www.bom.gov.au>.

Cancer Council of Victoria 2007. Solarium boom shocks skin cancer experts. Viewed 3 October 2007, < www.cancervic.org.au>.

Centre for Epidemiology and Research 2007. New South Wales school students health behaviours survey: 2005 report. Sydney: NSW Department of Health.

Cheung YB 2000. Marital status and mortality in British women: a longitudinal study. International Journal of Epidemiology 29:93–9.

Cole TJ, Bellizzi MC, Flegal KM & Dietz WH 2000. Establishing a standard definition for child overweight and obesity worldwide: international survey. British Medical Journal 320:1–6.

Collins D & Lapsley H 2008. The costs of tobacco, alcohol and illicit drug abuse to Australian society in 2004/05. National Drug Strategy Monograph Series no. 66. Canberra: Department of Health and Ageing.

Coombs RH 1991. Marital status and personal wellbeing: a literature review. Family Relations 40:97–102.

Corvalan C, Hales S & McMichael A 2005. Ecosystems and human well-being: health synthesis. A report of the Millennium Ecosystem Assessment. Washington, DC: Island Press.

Dalton C, Gregory J et al. 2004. Foodborne disease outbreaks in Australia, 1995 to 2000. Communicable Diseases Intelligence 28:211–24.

DECODA Study Group 2003. Age- and sex-specific prevalence of diabetes and impaired glucose regulation in 11 Asian cohorts. Diabetes Care 26(6):1770–80.

DECODE Study Group 2003. Age- and sex-specific prevalences of diabetes and impaired glucose regulation in 13 European cohorts. Diabetes Care 26(1):61–9.

DEH (Department of Environment and Heritage) 2004. State of the air, national ambient summary report 1991–2001. Canberra: Department of Environment and Heritage.

de Visser RO, Smith AMA, Rissel CE, Richters J & Grulich AE 2003a. Sex in Australia: Heterosexual experience and recent heterosexual encounters among a representative sample of adults. Australian and New Zealand Journal of Public Health 27(2):146–54.

de Visser RO, Smith AMA, Rissel CE, Richters J & Grulich AE 2003b. Sex in Australia: Safer sex and condom use among a representative sample of adults. Australian and New Zealand Journal of Public Health 27(2):223–9.

DHAC (Commonwealth Government Department of Health and Aged Care) 1999. National physical activity guidelines for Australians. Canberra: DHAC.

Diabetes Australia 2006a. Heart disease and diabetes. Viewed 20 February 2008, <www.diabetesaustralia.com.au>.

Diabetes Australia 2006b. What is diabetes? Viewed 9 October 2007, <www.diabetesaustralia.com.au>.

DoHA (Australian Government Department of Health and Ageing) 2004a. Active kids are healthy kids. Australia's physical activity recommendations for 5–12 year olds. Canberra: DoHA.

DoHA 2004b. Get out and get active. Australia's physical activity recommendations for 12–18 year olds. Canberra: DoHA.

DoHA & NHMRC (National Health and Medical Research Council) 2003. Food for health—Dietary guidelines for Australians (A4 booklet). Canberra: DoHA & NHMRC.

Dunn A, Trivedi M & O'Neal H 2001. Physical activity dose-response effects on outcomes of depression and anxiety. Medicine and Science in Sports and Exercise 33:S587–S597.

Dunstan D, Zimmet P, Welborn T, Sicree R, Armstrong T, Atkins R et al. 2001. Diabesity and associated disorders in Australia—2000: the accelerating epidemic. The Australian Diabetes, Obesity and Lifestyle Study (AusDiab). Melbourne: International Diabetes Institute.

Econtech 2007. Economic modelling of the net costs associated with non-participation in sport and physical activity. Report prepared for Medibank Private.

Environmental Protection and Heritage Council 2007. Jurisdictional monitoring reports, 2002–2006. Viewed 8 October 2007, <www.ephc.gov.au>.

Flegal KM, Graubard BI, Williamson DF & Gail MH 2005. Excess deaths associated with underweight, overweight and obesity. Journal of the American Medical Association 293:1861–7.

FSANZ (Food Standards Australia New Zealand) 2005. The 21st Australian Total Diet Study: a total diet study of sulphites, benzoates and sorbates. Canberra: FSANZ.

FSANZ 2006. Trans fatty acids. Viewed 11 February 2008, <www.foodstandards.gov.au>.

FSANZ 2007. Australia and New Zealand Food Regulation Ministerial Council joint communiqué 22 June 2007: Food Ministers protect public health. Viewed 24 July 2007, <www.foodstandards.gov.au>.

Glover J, Hetzel D & Tennant S 2004. The socioeconomic gradient and chronic illness and associated risk factors in Australia. Australia & New Zealand Health Policy 1:8.

Groot W & van den Brink HM 2006. Measuring the effects of education on health and civic engagement: proceedings of the Copenhagen symposium. 4A. What does education do to our health? Paris: OECD.

Grulich AE, de Visser RO, Smith AMA, Rissel CE, & Richters J 2003. Sex in Australia: Homosexual experience and recent homosexual encounters among a representative sample of adults. Australian and New Zealand Journal of Public Health 27(2):155–63.

Hall G, Kirk MD et al. 2005. Estimating foodborne gastroenteritis, Australia. Emerging Infectious Diseases 8:1257–64.

Hands B, Parker H, Glasson C, Brinkman S & Read H 2004. Physical activity and nutrition levels in Western Australian children and adolescents: report. Perth: Western Australian Government.

IPCC (Intergovernmental Panel on Climate Change) 2007a. Climate change 2007: the physical science basis, summary for policymakers. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge: Cambridge University Press.

IPCC 2007b. Climate change 2007: impacts, adaptation and vulnerability, summary for policymakers. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge: Cambridge University Press.

Katsouyanni K 2003. Ambient air pollution and health. British Medical Bulletin 68:143–56.

Kirk M, Little C et al. 2004. An outbreak due to peanuts in their shell caused by Salmonella enterica serotypes Stanley and Newport—sharing molecular information to solve international outbreaks. Epidemiology and Infection 132:571–7.

Le Q & Le T 2005. Cultural attitudes of Vietnamese migrants on health issues. Viewed 3 October 2007, <www.aare.edu.au>.

Li C-Y, Wu SC & Wen SW 2000. Longest held occupation in a lifetime and risk of disability in activities of daily living. Occupational and Environmental Medicine 57:550–4.

Manins P, Allan R, Beer T, Fraser P, Holper P, Suppiah R et al. 2001. Atmosphere: Australia state of the environment report 2001 (theme report). Canberra: CSIRO.

Mapp SJ & Coughlin PB 2006. Scurvy in an otherwise well young man. Medical Journal of Australia 185(6):331–2.

Marks GC, Rutishauser IHE, Webb K & Picton P 2001. Key food and nutrition data for Australia 1990–1999. Australian Food and Nutrition Monitoring Unit. Viewed 4 September 2007, < www.health.gov.au>.

Mason RS & Diamond TH 2001. Vitamin D deficiency and multicultural Australia. Medical Journal of Australia 175:236–7

Mathers CD & Schofield DJ 1998. The health consequences of unemployment: the evidence. Medical Journal of Australia 168:178–82.

McMichael AJ, Woodruff R & Hales S 2006. Climate change and human health: present and future risks. Lancet 367:859–69.

Medicare Australia 2008. Australian Childhood Immunisation Register statistics. Viewed 9 February 2008, <www.medicareaustralia.gov.au>.

Mishra G, Ball K, Arbuckle J & Crawford D 2002. Dietary patterns of Australian adults and their association with socioeconomic status: results from the 1995 National Nutrition Survey. European Journal of Clinical Nutrition 56:687–93.

NATSINWP (National Aboriginal and Torres Strait Islander Nutrition Working Party) 2001. National Aboriginal and Torres Strait Islander nutrition strategy and action plan. Canberra: National Public Health Partnership.

NBCC (National Breast Cancer Centre) 2005. Key findings: National Breast Cancer Centre Breast Health Survey results. Viewed 3 October 2007, <www.nbocc.org.au>.

NCHECR (National Centre in HIV Epidemiology and Clinical Research) 2007a. HIV/AIDS, viral hepatitis and sexually transmissible infections in Australia annual surveillance report 2007. Cat. no. PHE 92. Canberra: AIHW.

NCHECR 2007b. Australian needle and syringe program survey national data report 2002–2006. Sydney: NCHECR.

NDS (National Drug Strategy) 2002. Environmental tobacco smoke in Australia. National Tobacco Strategy 1999 to 2002–03. Occasional paper. Canberra: Department of Health and Ageing.

NHMRC (National Health and Medical Research Council) 1994. Folate fortification. Report of the expert panel on folate fortification. Endorsed at the 117th session of the NHMRC, Sydney, 1–2 June 1994. Canberra: AGPS.

NHMRC 1997. The health effects of passive smoking: a scientific information paper. Canberra: AGPS.

NHMRC 1999. Dietary guidelines for older Australians. Canberra: NHMRC.

NHMRC 2001a. Australian alcohol guidelines: health risks and benefits. Canberra: NHMRC.

NHMRC 2001b. National evidence based guidelines for management of Type 2 diabetes mellitus. Part 3—Primary prevention of Type 2 diabetes. Viewed 3 October 2007, <www.nhmrc.gov.au>.

NHMRC 2003a. Dietary guidelines for Australian adults. Canberra: NHMRC.

NHMRC 2003b. Dietary guidelines for children and adolescents. Canberra: NHMRC.

NHMRC & NRMMC (Natural Resource Management Ministerial Council) 2004. National water quality management strategy: Australian drinking water guidelines. Canberra: NHMRC.

NHPC (National Health Performance Committee) 2004. National report on health sector performance indicators 2003. Cat. no. HWI 78. Canberra: AIHW

NSW Health 2006. Communicable diseases report, New South Wales, for January and February 2006. NSW Public Health Bulletin 17(3–4):58–9.

OECD (Organisation for Economic Co-operation and Development) 2007. OECD health data 2007: statistics and indicators for 30 countries. Paris: OECD.

OzFoodNet 2007. Monitoring the incidence and causes of diseases potentially transmitted by food in Australia: annual report of the OzFoodNet network, 2006. Communicable Diseases Intelligence 31(4):345–65.

Peng B & Parton KA 2003. Climate variations and the transmission of Ross River virus infection in coastal and inland region of Queensland: an analysis from Townsville and Toowoomba. Environmental Health 3(4):73–9.

Peng B, Parton KA & Donald K 2004. Climate variability and the transmission of Ross River virus in coastal regions of Queensland, Australia. Environmental health 4(2):88–94.

Perusco A, Rikard-Bell G, Mohsin M, Millen E, Sabry M, Poder N et al. 2007. Tobacco control priorities for Arabic Speakers: key findings from a baseline telephone survey of Arabic speakers residing in Sydney's south-west. Health Promotion Journal of Australia 18(2):121–6.

Preston BL & Jones RN 2006.Climate change impacts on Australia and the benefits of early action to reduce global greenhouse gas emissions. Canberra: CSIRO.

Queensland Health 2001. Cyanobacteria in recreational and drinking waters, Environmental health assessment guidelines. Brisbane: Queensland Health.

Rahkonen O, Laaksonen M, Martikainen P, Roos E & Lahelma E 2006. Job control, job demands, or social class? The impact of working conditions on the relation between social class and health. Journal of Epidemiology and Community Health 60:50–4.

Reid WV, Mooney HA, Cropper A et al. 2005. Ecosystems and human well-being: synthesis. A report of the Millennium Ecosystem Assessment. Washington, DC: Island Press.

Schrijvers CTM, Dike van de Mheen H, Stronks K & Mackenbach JP 1998. Socioeconomic inequalities in health in the working population: the contribution of working conditions. International Journal of Epidemiology 27:1011–8.

SEQWater 2008. Current dam levels. Viewed 8 February 2008, <www.seqwater.com.au>.

SIGNAL (Strategic Inter-Governmental Nutrition Alliance) 2001. Eat well Australia: an agenda for action for public health nutrition. Canberra: National Public Health Partnership.

Spencer N 2005. Does material disadvantage explain the increased risk of adverse health, educational, and behavioural outcomes among children in lone parent households in Britain? A cross sectional study. Journal of Epidemiology and Community Heath 59:152–7.

Tuomilehto J, Lindstrom J, Eriksson J et al. 2001. Prevention of Type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. New England Journal of Medicine 344 (18):1343–50.

Unwin N, Shaw J, Zimmet P & Alberti KGMM 2002. Impaired glucose tolerance and impaired fasting glycaemia: the current status on definition and intervention. Diabetic Medicine 19(9):708–23.

Victorian Department of Human Services 2007. Drinking water annual report. Viewed 8 October 2007, <www.health.vic.gov.au>.

Villareal DT, Apovian CM, Kushner RF & Klein S 2005. Obesity in older adults: technical review and position statement of the American Society for Nutrition and NAASO, The Obesity Society. American Journal of Clinical Nutrition 82:923–34.

Water Services Association of Australia 2007. National performance report 2005–06. Viewed 3 October 2007, <www.wsaa.asn.au>.

White V & Hayman J 2006. Smoking behaviours of Australian secondary students in 2005. National Drug Strategy monograph no. 59. Canberra: Department of Health and Ageing.

WHO (World Health Organization) 1999. Definition, diagnosis and classification of diabetes mellitus and its complications. Part 1: Diagnosis and classification of diabetes mellitus. Geneva: Department of Noncommunicable Disease Surveillance, WHO.

WHO 2000. Obesity: preventing and managing the global epidemic. Report of a WHO consultation. WHO Technical Report Series 894. Geneva: WHO.

WHO 2002. World health report 2002: reducing risk, promoting healthy life. Geneva: WHO.

WHO 2003. Artificial tanning sunbeds: risks and guidance. Viewed 18 February 2008, <www.who.int>.

WHO 2005. WHO global comparable estimates 2005. Viewed 4 September, <www.who.int>.

WHO 2006. Global strategy on diet, physical activity and health. Geneva: WHO.

WHO–ISH (World Health Organization–International Society of Hypertension) 1999. Guidelines for the management of hypertension. Journal of Hypertension 17:151–83.

WHO–ISH 2003. 2003 World Health Organization (WHO)–International Society of Hypertension (ISH) statement on management of hypertension. Journal of Hypertension 21:1983–92.

Wolfe B & Zuvekas S 1997. Nonmarket outcomes of schooling. International Journal of Education Research 27:491–501.

Woodruff R, Hales S, Butler C & McMichael AJ 2005. Climate change health impacts in Australia. Effects of dramatic CO_2 emission reductions. Canberra: Australian Conservation Foundation and Australian Medical Association.

Working Group of the Australian and New Zealand Bone and Mineral Society, Endocrine Society of Australia & Osteoporosis Australia 2005. Vitamin D and adult bone health in Australia and New Zealand: a position statement. Medical Journal of Australia 182(6):281–5.

Wu Z, Penning MJ, Pollard MS & Hart R 2003. In sickness and in health. Does cohabitation count? Journal of Family Issues 24:811–38.

Yan L, Daviglus M, Lui K, Pirzada A, Garside D, Schiffer L et al. 2004. BMI and health-related quality of life in adults 65 years and over. Obesity Research 12(1):69–75.

5

Diseases and injury

Key points

- Among the broad categories of disease, cancer is the leading cause of disease burden (19% of Australia's total), closely followed by cardiovascular disease (18%), then mental disorders (13%).
- Death rates are falling for many of our leading health concerns: cancer, heart disease, strokes, injury and asthma are examples.
- Heart attack rates are falling and survival from the attacks is improving.
- Survival is improving for cancer overall.
- Asthma has become less common among children and young adults.
- Diabetes is becoming more common—prevalence at least doubling in the past two decades.
- There has been a tripling in new cases of treated end-stage kidney disease in the past 25 years.

Diseases and injury are important components of ill health. They cause much suffering, disability and premature mortality. They also impose significant costs on society in terms of health system use (see chapters 7 and 8), days off work because of illness or to care for people who are ill, and reduced quality of life.

Despite diseases and injuries remaining large problems, the situation is improving on many fronts. For example, death rates continue to fall for cancers, cardiovascular disease, asthma, chronic lung disease and injury. This is partly because of fewer of these problems arising in the first place—or at least arising later in people's lives—and partly because of better survival when they do arise. However, the increase in the number of people with certain diseases—notably diabetes and mental health problems—is cause for concern.

This chapter covers Australia's main health problems, namely those that cause the greatest overall disability, premature death or both. The combined extent of disability and premature death —known as 'disease burden'—caused by the conditions covered in this chapter is around 80% of the total burden of disease (see Box 5.1 and Section 2.6).

Box 5.1: Burden of disease for conditions described in this chapter

Almost 80% of the total burden of disease (see Chapter 2) is covered by the conditions described in this chapter. The largest contributions come from cancers, cardiovascular disease (CVD) and mental disorders. These figures do not include chronic kidney disease, which was not identified separately in the burden of disease study, although some of its burden is included with diabetes.

The conditions vary in whether the burden is mainly because of premature death or years lived with disability or illness. Cancers, CVD and injury have over 70% of their burden coming from premature death; and asthma, musculoskeletal disease, mental disorders and oral health problems have more than 90% of their burden coming from the disability/illness component.

Burden of diseases for conditions in this chapter, 2003

Broad cause group	Specific categories	Proportion of burden (per cent)	Fatal component[(a)] (per cent)
Cancers		19.4	82
Cardiovascular disease		18.0	78
Diabetes		5.5	22
Chronic kidney disease[(b)]		n.a.	n.a.
Chronic respiratory disease	Chronic obstructive pulmonary disease (COPD)	3.3	54
	Asthma	2.4	6
Musculoskeletal disease		4.0	7
Neurological and sense disorders	Dementia	3.6	26
Mental disorders		13.3	7
Oral health problems		0.9	0
Injury		7.0	76
Infectious diseases		1.7	69
Total in this chapter		*79.1*	
All diseases		**100.0**	

(a) Proportion of burden due to premature death, with the remainder being due to years lived with disability.

(b) Chronic kidney disease is not quantified separately in the Burden of Disease study.

Source: Begg et al. 2007.

5.1 Cancer

Cancer is a diverse group of diseases in which some of the body's cells become defective, begin to multiply out of control, can invade and damage the tissue around them, and can also spread (metastasise) to other parts of the body to cause further damage. Cancer was the leading cause of the total burden of disease and injury in Australia in 2003, with four-fifths of this burden due to premature death. However, over the last decade, improvements in early detection and treatment have resulted in improved survival and a clear decline in mortality for most cancers, despite the overall cancer incidence rate remaining virtually unchanged.

This section describes current cancer incidence and mortality for all cancers and for National Health Priority Area (NHPA) cancers. The eight NHPA cancers are colorectal cancer, lung cancer, melanoma of the skin, non-melanoma skin cancer, breast cancer in females, cancer of the cervix, prostate cancer and non-Hodgkin lymphoma.

Information on new cases of cancer is collected by state and territory cancer registries, and compiled by the AIHW at the National Cancer Statistics Clearing House (see Box 5.2). Information on screening for cancer is included in Chapter 7.

Box 5.2: Cancer surveillance and monitoring in Australia

Cancer registration, excluding non-melanoma skin cancer, is required by law in each of the states and territories, usually under the Public Health Acts, where the data are collated by cancer registries. These registries collect clinical and demographic information about people with newly diagnosed cancer from hospitals, pathologists, oncologists, cancer treatment centres and nursing homes.

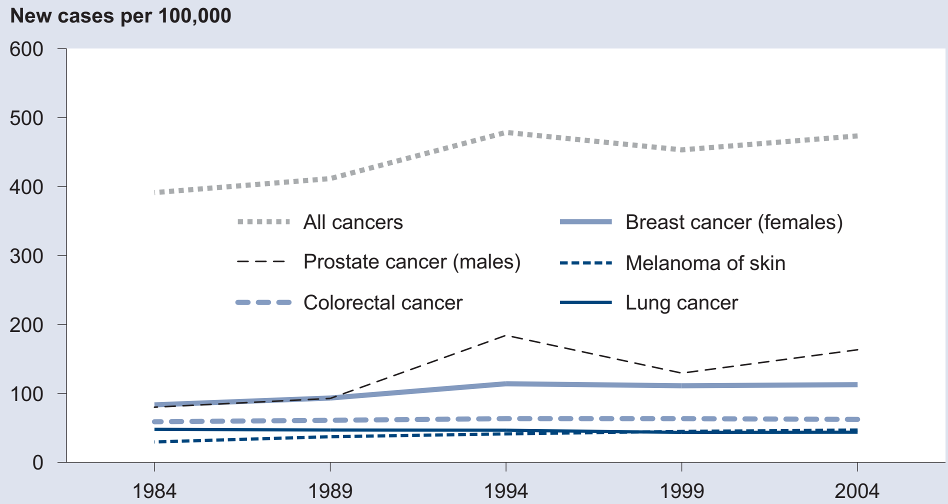
All state and territory cancer registries supply records of all new cases of cancer (since 1982), excluding non-melanoma skin cancer, to the National Cancer Statistics Clearing House (NCSCH). The NCSCH is operated by the AIHW under the supervision of the Australasian Association of Cancer Registries). Both the Australian Institute of Health and Welfare Act and the Australian Government privacy law provide for the protection of confidentiality of records supplied to the NCSCH.

Incidence

The incidence of cancer is the number of new cases in a given period, usually one year. Excluding non-melanoma skin cancer, nearly 100,000 new cases of cancer (54,870 males and 43,466 females) were diagnosed in Australia in 2004. The incidence of 474 cases per 100,000 persons was slightly lower than the rate of 479 a decade earlier, but much higher than the rate of 391 in 1984 (Figure 5.1).

The overall cancer incidence rate was higher among males than females. The imbalance was greatest for mesothelioma, where the male rate was over 6 times as high as the female rate, and for smoking-related cancers such as cancers of the mouth, throat and lung. These excess rates had their origins up to 35 years earlier in the higher exposure of males to asbestos (which causes mesothelioma) and in higher male rates of smoking.

The current situation is that, by the age of 75 years, 1 in 3 Australian males and 1 in 4 females will have been diagnosed with cancer at some stage of their life. The risk by age 85 years increases to 1 in 2 for males and 1 in 3 for females.



Notes

1. Excludes non-melanoma skin cancer.
2. Incidence rates, given as number of new cases per 100,000 persons, were age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Cancer Statistics Clearing House.

Figure 5.1: Trends in incidence, selected cancers, 1984 to 2004 (*NHPC indicator 1.02*)

It is projected that the number of new cases of cancer in 2008 will be around 108,000, a 10% increase on 2004. Most of the projected increase is because of growth in the population aged 60 years and over. In 2004 the average age at diagnosis was 67 years for males and 64 years for females.

Most common cancers

Among males in 2004, prostate cancer was the most common new case of cancer registered, with 15,759 cases diagnosed, a large increase on the 3,886 cases diagnosed in 1984. This increase was largely because of increased use of prostate-specific antigen tests in screening for prostate cancer. Colorectal cancer (7,160 new cases), lung cancer (5,826) and melanoma (5,503) were the next most common cancers diagnosed, apart from non-melanoma skin cancer. Together these four accounted for 62% of all registered cancers in males in 2004.

In 2004, breast cancer (12,126 new cases) was the most commonly registered cancer in females, followed by colorectal cancer (5,817 new cases), melanoma (4,219) and lung cancer (3,270). These four accounted for 59% of all registered cancers in females in 2004.

Non-melanoma skin cancers

Two kinds of non-melanoma skin cancer, namely basal cell carcinoma and squamous cell carcinoma, are not legally notifiable diseases. Therefore national incidence of these cancers must be estimated from periodic national household surveys (NCCI 2003). Based on the most recent survey (in 2002) there are projected to be around 433,000 new cases of non-melanoma skin cancer in 2008, of which 295,000 will be basal cell carcinoma and 138,000 squamous cell carcinoma.

Relative survival

Crude survival from cancer measures the time between diagnosis and death. A more meaningful measure is relative survival, as this adjusts crude survival for expected survival in the general population, taking into account deaths from other causes.

The standard measure for cancer is 5-year relative survival. For cancers as a whole, this improved markedly from 41% for males diagnosed in 1982–1986 to 58% for those diagnosed in 1998–2004 (Table 5.1). There was a similar improvement for females diagnosed in these periods—from 53% to 64%.

These gains have largely been attributed by The Cancer Council Australia to better diagnostic tools, earlier detection and improvements in treatment. But the gains have not been consistent across all types of cancer. For example, brain cancer has poor survival, and its 5-year relative survival has fallen slightly over the 20 years to 2004 from 21% to 19% for males and from 20% to 19% for females. In contrast, early detection through the BreastScreen Australia screening program and improvements in treatment have contributed to 5-year relative survival for breast cancer in females improving from 72% for those diagnosed in 1982–1986 to 88% for those diagnosed in 1998–2004.

There has also been success with the National Cervical Screening Program. It has achieved improvements in early detection and treatment of pre-cancerous abnormalities, thereby considerably reducing both incidence and subsequently mortality since the early 1990s. Despite this preventive success, once cervical cancer has been diagnosed its 5-year relative survival has remained at around 70% for the past two decades.

Table 5.1: Trends in 5-year relative survival for selected cancers, diagnoses from 1982–1986 to 1998–2004 (*NHPC indicator 3.09*) (per cent)

Cancer site	1982–1986	1987–1991	1992–1997	1998–2004
Males				
All cancers	41.3	45.9	54.8	58.4
Stomach	16.2	18.9	20.5	24.4
Colorectal	47.7	52.0	56.8	61.3
Lung	7.9	9.1	9.7	10.7
Melanoma	82.2	86.3	89.3	89.7
Prostate	57.4	63.2	81.7	85.3
Testis	90.8	95.0	95.3	96.8
Kidney	45.2	49.8	58.6	65.6
Brain	20.8	19.7	18.7	18.5
Thyroid	79.1	78.3	85.3	87.7
Hodgkin lymphoma	72.0	76.8	81.5	84.8
Non-Hodgkin lymphoma	46.3	48.2	52.3	61.6
Leukaemia	37.9	42.6	43.0	48.2

(continued)

Table 5.1 (continued): Trends in 5-year relative survival for selected cancers, diagnoses from 1982–1986 to 1998–2004 (*NHPC indicator 3.09*) (per cent)

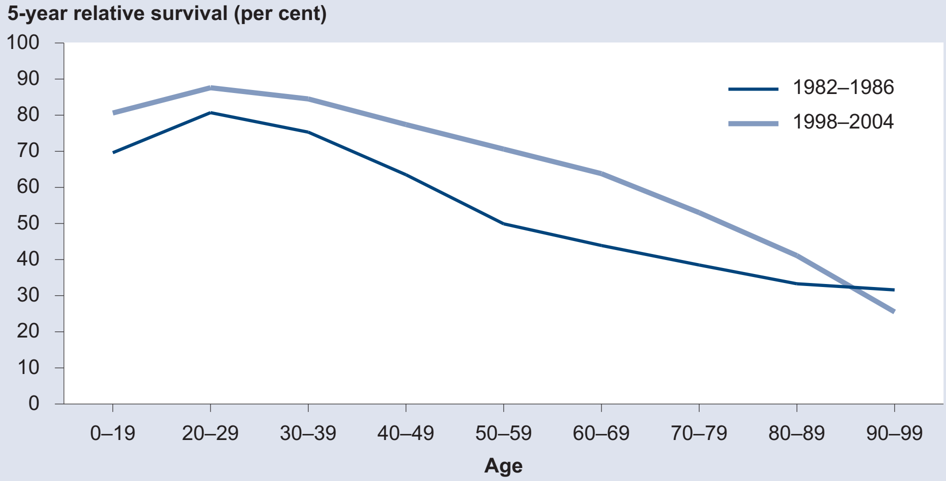
Cancer site	1982–1986	1987–1991	1992–1997	1998–2004
Females				
All cancers	53.2	57.1	60.8	64.1
Stomach	18.2	18.9	22.3	25.3
Colorectal	49.7	53.2	57.4	62.4
Lung	10.5	10.8	12.6	14.0
Melanoma	90.5	92.8	93.9	94.1
Breast	71.8	77.5	83.7	87.8
Body of uterus	75.6	78.0	80.2	82.1
Cervix	68.3	71.2	73.6	71.8
Ovary	32.7	35.7	37.9	39.8
Kidney	48.8	52.5	58.7	66.0
Brain	19.9	20.4	18.3	19.4
Thyroid	85.3	89.9	94.3	95.3
Hodgkin lymphoma	71.3	77.5	83.6	85.8
Non-Hodgkin lymphoma	47.6	52.4	54.0	62.6
Leukaemia	37.2	42.9	42.8	47.3

Note: Relative survival calculated using the methodology of Dickman (2004).

Source: AIHW National Cancer Statistics Clearing House.

Five-year relative survival for persons diagnosed with cancer in 1998–2004 was highest for those aged 20–29 years, at 88%, and next highest for those aged 30–39 years, at 85% (Figure 5.2). It then declined steadily with age to 26% for those aged 90–99 years.

The greatest gains in survival for persons diagnosed in 1998–2004, compared with those diagnosed in 1982–1986, were in the 50–59 year age group, from 50% to 71%, and in the 60–69 year age group, from 44% to 64%.



Source: AIHW National Cancer Statistics Clearing House.

Figure 5.2: Age-specific all-cancer 5-year relative survival for people diagnosed in 1982–1986 and 1998–2004

Mortality

Cancer is a major cause of death, accounting for 30% of all deaths in 2005. From the perspective of total numbers, the falling death rate from cancer is being offset by increased population growth in the 65 years and over age group, as this group has the highest rates of cancer incidence and mortality.

In 2005 there were 38,838 deaths from cancer (Table 5.2). Of these, 21,860 were of males (33% of all male deaths) and 16,978 were of females (27% of all female deaths). The average age at death was 72 years in both males and females. It is projected that there will be around 41,000 deaths from cancer in 2008.

The age-standardised death rate for cancers overall fell from 212 per 100,000 persons in 1984 to 182 in 2005—a 14% fall over two decades. Among the NHPA cancers, the fall in death rates since 1984 has been highest for cervical cancer, where substantial decreases in the number of females developing the disease has been achieved through the use of Pap smears to detect pre-cancerous abnormalities that can then be treated before they develop into cancer. The death rates have also fallen for breast, lung and colorectal cancers.

Table 5.2: Trends in mortality, selected cancers, 1984 to 2005 (*NHPC indicator 1.08*)

	Year					
Type of cancer	**1984**	**1989**	**1994**	**1999**	**2004**	**2005**
			Number of deaths			
All cancers	26,645	30,555	34,134	35,575	38,489	38,838
NHPA cancers						
Lung cancer[(a)]	5,555	6,308	6,734	6,771	7,259	7,399
Colorectal cancer	3,738	4,127	4,587	4,527	4,068	4,113
Prostate cancer (males)	1,441	2,025	2,613	2,513	2,792	2,946
Breast cancer (females)	2,166	2,449	2,669	2,512	2,664	2,719
Non-Hodgkin lymphoma	803	1,122	1,414	1,503	1,468	1,390
Melanoma of skin	640	782	897	1,005	1,200	1,273
Non-melanoma skin cancer	228	285	358	383	360	405
Cervical cancer (females)	339	369	341	226	210	216
			Death rate[(b)]			
All cancers	212.3	214.4	212.6	194.2	184.6	181.6
NHPA cancers						
Lung cancer[(a)]	42.6	42.9	41.2	36.8	34.9	34.7
Colorectal cancer	30.5	29.5	28.7	24.8	19.5	19.2
Prostate cancer (males)	33.3	39.6	43.6	35.2	33.0	33.6
Breast cancer (females)	31.6	31.6	30.8	25.5	23.8	23.7
Non-Hodgkin lymphoma	6.2	7.8	8.8	8.2	7.1	6.5
Melanoma of skin	4.8	5.4	5.5	5.5	5.8	6.0
Non-melanoma skin cancer	2.0	2.1	2.3	2.1	1.7	1.9
Cervical cancer (females)	4.9	4.7	3.9	2.3	1.9	1.9

(a) Includes trachea, bronchus and lung cancer.

(b) Death rates, given as number of deaths per 100,000 persons, were age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Mortality Database.

The current risk of dying from a cancer before the age of 75 years is 1 in 8 for males and 1 in 11 for females. The risk of dying from cancer before the age of 85 years is double these proportions: 1 in 4 for males and 1 in 6 for females.

Burden of disease

Cancer was the leading cause of the total burden of disease and injury in Australia in 2003. It accounted for 19% of the total burden, compared with 18% for cardiovascular disease. Four fifths (82%) of the cancer burden was due to premature death and the remainder to the non-fatal burden of years of life lost due to disability (YLD). (See Section 2.6 about the burden of disease generally.)

Males accounted for 53% of the cancer burden and females 47%. Among males in 2003, the cancers with the highest burden, measured by disability-adjusted life years (DALYs), were lung cancer (55,028 DALYs), prostate cancer (36,547), colorectal cancer (34,643) and melanoma (13,734). Among females the highest burden was due to breast cancer (60,520 DALYs), lung cancer (33,876), and colorectal cancer (28,962).

Since the 1990s, cancer has replaced cardiovascular disease as the greatest cause of years of life lost (YLL), or fatal burden. Among males in 2003, the cancers most responsible for fatal burden were lung cancer (51,505 YLL), colorectal cancer (27,997), prostate cancer (23,175), pancreatic cancer (11,136), brain cancer (10,718), lymphoma (10,474), melanoma (10,108) and leukaemia (10,039). Among females the cancers with the highest fatal burden were breast cancer (40,080 YLL), lung cancer (31,551), colorectal cancer (23,735), pancreatic cancer (10,984), ovarian cancer (10,946), lymphoma (8,324), brain cancer (7,809) and leukaemia (7,468).

Cancer has a lower contribution to non-fatal burden than other major diseases and injury. In males the cancer with the highest non-fatal burden in 2003 was prostate cancer with 13,372 YLD, and in females it was breast cancer with 20,440 YLD.

Cancer in Aboriginal and Torres Strait Islander peoples

Aboriginal and Torres Strait Islander peoples are under-represented in cancer incidence reporting because Indigenous status is not yet included in pathology forms, and the extent to which Aboriginal and Torres Strait Islander cancer patients are identified in hospital statistics varies around Australia.

Nevertheless, just over 3,000 new cases of cancer in Aboriginal and Torres Strait Islander peoples were notified to state and territory cancer registries from 2000 to 2004. In contrast to the non-Indigenous population, more new cases of cancer were reported in females (1,598) than in males (1,485). The most common cancers diagnosed in Indigenous males in 2000–2004 were cancer of the lung, bronchus and trachea (288 cases reported), prostate cancer (145), colorectal cancer (141), cancer of unknown primary site (95), and lymphomas (71). The most common cancers diagnosed in Indigenous females were breast cancer (392 cases reported), cancer of the lung, bronchus and trachea (186), colorectal cancer (142), cancer of the cervix (110) and cancer of unknown primary site (102).

When the age-standardised incidence rate of these cancers among Indigenous Australians was compared with that of their non-Indigenous counterparts, even with the under-reporting it was higher in both males and females for lung cancer and cancer of unknown primary site and more than double the rate for cervical cancer. High lung cancer incidence is caused by high rates of smoking earlier in life, and high cervical cancer incidence is preventable by early detection in Pap test screening. High incidence of cancer of unknown primary site is likely to be associated with late diagnosis.

The most common causes of cancer death registered in Indigenous males in 2000–2004 were cancer of the lung, bronchus and trachea, cancer of unknown primary site, cancer of the oesophagus, colorectal cancer and liver cancer. For Indigenous females, the most common causes of cancer death were cancer of the lung, bronchus and trachea, breast cancer, cancer of unknown primary site, cancer of the cervix and colorectal cancer.

5.2 Cardiovascular disease

The term 'cardiovascular disease' (CVD) covers all diseases and conditions of the heart and blood vessels (see Box 5.3). Closely behind cancer, CVD is Australia's second leading cause of disease burden, mainly because of the deaths it causes. Over the past few decades, Australia has made impressive gains in fighting CVD, with its death rates falling dramatically to levels below those of 100 years ago. Despite these great advances, among the broad groupings of disease CVD is still Australia's biggest killer, now mostly because of the deaths it causes among older people.

Coronary heart disease, stroke, heart failure and peripheral vascular disease are the major contributors to the cardiovascular disease burden in Australia. Congenital heart and vascular diseases constitute one of the leading causes of death in the first year of life. Rheumatic fever and chronic rheumatic heart disease are a significant problem among Aboriginal and Torres Strait Islander peoples.

Box 5.3: Cardiovascular disease definition and estimates

The definition of 'cardiovascular diseases' differs between organisations. In this report, as in other material prepared by the AIHW, the terms 'cardiovascular disease', 'circulatory disease' and 'heart, stroke and vascular diseases' are used interchangeably to convey the same meaning. The ABS has used the term 'heart, stroke and vascular diseases' to represent a subgroup of 'diseases of the circulatory system' (ABS 2006a).

In addition, the figures on prevalence of cardiovascular conditions shown in this section are based on data on long-term conditions collected in the ABS National Health Survey but the method used here to analyse the data is different from that used by the ABS. Hence the data presented in this section differ from those presented by the ABS, and from those in *Australia's health 2006*.

The main underlying causal mechanism in CVD is plaque formation, a process marked by abnormal build-ups of fat, cholesterol and other substances in the inner lining of the arteries. It is most serious when it leads to a reduced or blocked blood supply to the heart (causing angina or heart attack) or to the brain (causing a stroke).

The major preventable risk factors for CVD are tobacco smoking, high blood pressure, high blood cholesterol, insufficient physical activity, overweight and obesity, poor nutrition and diabetes. Atrial fibrillation, transient ischaemic attack and a high intake of alcohol also increase the risk of stroke.

This section provides a brief statistical profile of CVD, followed by sections on coronary heart disease, stroke, heart failure and rheumatic heart disease. Information is also presented on health services use and CVD in Indigenous Australians.

All cardiovascular disease

CVD accounted for 46,134 deaths (35% of all deaths in Australia) in 2005. It is also one of the leading causes of disability, with around 1.4 million Australians (6.9% of the population) estimated to have disability associated with cardiovascular conditions. In the 2004–05 National Health Survey, about 19% of those surveyed reported one or more long-term diseases of the circulatory system, corresponding to 3.7 million Australians. The prevalence of CVD was significantly higher in females (55%) than in males (45%). Comparing males and females after adjusting for differences in age structure, females were 10% more likely to have CVD (19,449 females per 100,000 versus 17,439 for males).

Combining both the burden from premature death and the extent of its disability, CVD was estimated to account for 18% of the overall disease burden in Australia in 2003, with coronary heart disease and stroke contributing over four-fifths of this burden (Begg et al. 2007). Most of the cardiovascular burden was due to years of life lost (YLL) to premature death and they represented 29% of total YLL for Australia in 2003. Years of 'healthy' life lost due to poor health or disability (YLD) arising from CVD accounted for 8% of Australia's total YLD in 2003. The cardiovascular burden increases markedly with age, particularly from 60 years onwards.

CVD is the most expensive disease group in terms of direct health-care expenditure, at $5.9 billion, which is 11.2% of the health system's expenditure in 2004–05 that can be reliably attributed to various diseases.

Coronary heart disease

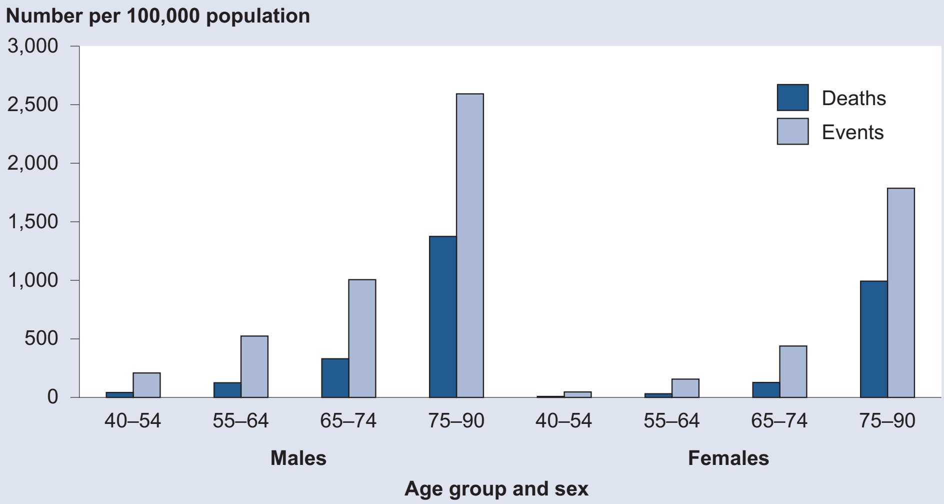
Coronary heart disease (CHD), also known as ischaemic heart disease, is the most common form of heart disease. There are two major clinical forms—heart attack (often known as acute myocardial infarction or AMI) and angina. A heart attack is a life-threatening event that occurs when a blood vessel supplying the heart itself is suddenly blocked completely, threatening to damage the heart and its functions. The blockage is due to a blood clot that forms when a plaque breaks open. Angina is a chronic condition in which short episodes of chest pain can occur periodically when the heart has a temporary deficiency in its blood supply. Episodes occur when one of the heart's arteries is already significantly narrowed by plaque and cannot meet an extra demand for blood flow, such as with exercise or strong emotion.

In 2003, CHD was the leading specific cause of disease burden overall for males (11% of overall burden in males) and the second leading specific cause for females (9% of overall burden in females) (Begg et al. 2007). Over 80% of the CHD burden was due to premature death.

From the 2004–05 National Health Survey, about 3.2% of Australians have CHD, corresponding to around 637,900 people. Among those with CHD, around 359,500 had angina and 354,700 people had had a heart attack (note that a person may report more than one disease). The prevalence of angina was higher among males than females, at 2.2% and 1.4% respectively. For a history of heart attack, the difference between males and females was greater still, with prevalences of 2.6% and 1.0% respectively. These differences remained after adjusting for differences in age structure, with males 1.8 times as likely as females to report angina (2,315 per 100,000 versus 1,319), and 3 times as likely to report heart attack (2,729 per 100,000 versus 905).

The prevalence of CHD increases markedly with age. Based on self-reported information in the NHS, around 7.5% of Australians aged 55–64 years have CHD, increasing to 20.3% among those aged 75 years and over.

The incidence of 'major coronary events' has been estimated from CHD deaths and non-fatal AMI hospitalisations (Jamrozik et al. 2001). Using this method, about 47,730 such events are estimated to have occurred in Australia in 2005 among those aged 40–90 years—about 130 per day. Around 40% of these events (19,430 cases) were fatal. The incidence rate for CHD events was higher among males than females at every age. This difference decreased with age: the ratio of the male to female rate was 4.9 for ages 40–54 compared with 1.4 for those aged 75–90 years. Both male and female incidence rates increased with age (Figure 5.3). The age-standardised incidence of major coronary events fell from 719 per 100,000 in 1996 to 511 in 2005.



Sources: AIHW National Hospital Morbidity Database; AIHW National Mortality Database.

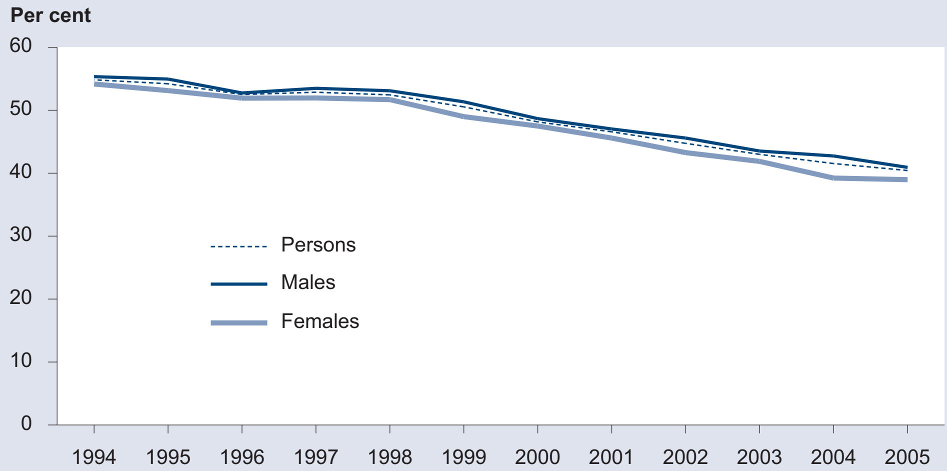
Figure 5.3: Major CHD events and CHD mortality, ages 40–90 years, 2005 (*NHPC indicators 1.01 and 1.08*)

CHD is a major cause of disability in Australia. In the 2003 Survey of Disability, Ageing and Carers, 1.5% of respondents reported one or more disabling conditions associated with CHD, corresponding to about 303,500 Australians. Of these, almost half (49%) needed help or had difficulties with self-care, mobility or communication.

CHD is the largest single cause of death in Australia, accounting for 23,570 deaths (18% of all deaths) in 2005. The number of CHD deaths increases greatly with age: 74% of all CHD deaths occur among those aged 75 years and over, and around 5% occur among those aged under 55 years. The male CHD death rate in 2005 was almost twice as high as the female rate (Figure 5.3). The proportion of people aged 40–90 years dying after a major coronary event (age-standardised case fatality rate) fell from 53% in 1996 to 40% in 2005 (Figure 5.4).

CHD death rates have fallen rapidly since the 1970s (Figure 5.5). In the latest decade alone (1996–2005), the age-standardised CHD death rate declined by 43% in males and 41% in females. These declines are due to both a reduction in heart attacks and better survival.

Australia's CHD death rates compare favourably with those of countries such as Slovakia, Hungary, Czech Republic, Finland, New Zealand and the United States, but they are still 1.5–3 times as high as in Spain, Portugal, France, Korea and Japan (OECD 2007).



Note: Age-standardised to the distribution of fatal and non-fatal events in 2001. This method differs to that used previously in AIHW: Mathur 2002 and NHPC 2004.

Sources: AIHW National Hospital Morbidity Database; AIHW National Mortality Database.

Figure 5.4: Proportion of people aged 40–90 years dying after major CHD events, 1996–2005 (*NHPC indicator 3.08*)

Cerebrovascular disease

Cerebrovascular disease refers to any disorder of the blood vessels supplying the brain and its covering membranes. Most cases of cerebrovascular death are due to stroke. Stroke occurs when a blood vessel to the brain is suddenly blocked or bleeds. This may result in part of the brain dying because of the lack of blood, leading to a loss of brain function or impairment in a range of activities including movement, thinking and communication. Blockage is the most common cause of stroke. There can also be temporary strokes (where symptoms disappear within 24 hours), known as transient ischaemic attacks.

(Note that this section uses the terms 'cerebrovascular disease' (ICD-10 codes I60–I69) and 'stroke' (ICD-10 codes I60–I64) in their strict meanings as explained above. However, sometimes other reports have used 'stroke' to mean 'cerebrovascular disease', as shorthand. Thus, the figures presented here may not be comparable to those shown elsewhere.)

Cerebrovascular disease was the fifth leading specific cause of disease burden overall for males (4% of overall burden in males) and the third leading cause for females (5% of overall burden in females) in 2003 (Begg et al. 2007). More than 70% of the cerebrovascular disease burden was due to premature death.

An estimated 40,000 to 48,000 stroke events occur in Australia every year—about one every 12 minutes. Most of these (70%) are first-ever strokes (AIHW 2004). Based on the 2003 Survey of Disability, Ageing and Carers (SDAC), 346,700 Australians in 2003 had had a stroke at some time in their lives. Of those who reported having had a stroke, 4 out of 5 were aged 60 years or over. More females than males report having had a stroke, but the age-standardised incidence is higher among males as they tend to have the stroke at a younger age.

Stroke is a significant cause of disability. From the SDAC, about 282,600 persons had a disability in 2003 along with a history of stroke, representing 7% of all people with disability. In about half of these cases, the disability was mainly attributed to the stroke.

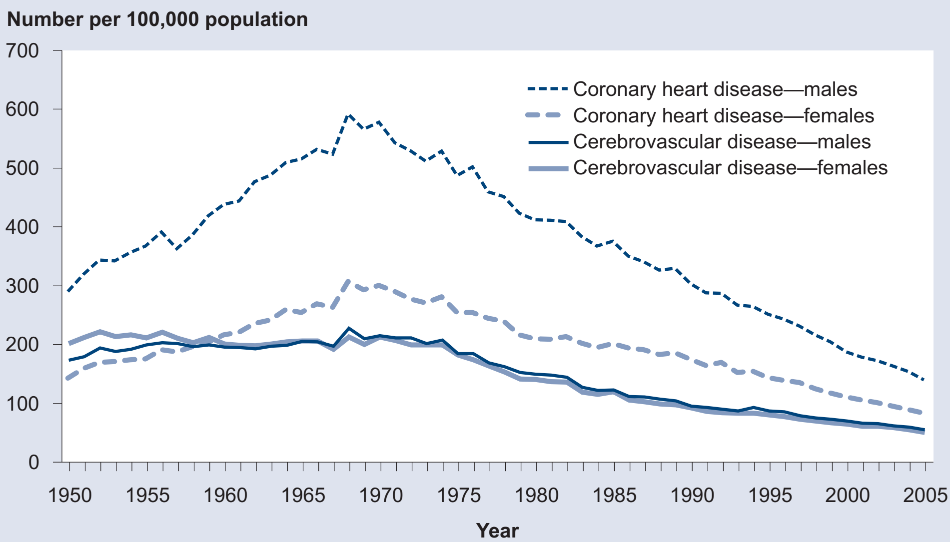
Stroke survivors with disability were much more likely to have a profound core activity limitation than the average person with disability. This means that the person is unable to achieve, or always needs help with, communication, mobility or self–care.

Most stroke survivors live at home, including those with disability. About half of this latter group needed assistance with health care, household chores, home maintenance, mobility and transport; and around one-quarter needed help with self-care, cognitive and emotional tasks, meal preparation and paperwork. The vast majority of people with stroke had a carer and informal carers provided most of the assistance with activities for those not in institutions (AIHW: Senes 2006).

Cerebrovascular disease accounted for 11,513 deaths (9% of all deaths) in 2005. Most of these deaths (83%) occurred among those aged 75 years or over. More females than males (6,845 compared with 4,668) died of cerebrovascular disease. However, the age-standardised death rate was slightly higher among males, reflecting the higher death rates for males in most age groups except the very oldest.

Australia's mortality from cerebrovascular disease has been declining in recent decades. There was no downward trend in the death rates between 1950 and 1975. However, since the mid-1970s, consistent declines have been noted for both males and females. Age-standardised death rates for cerebrovascular disease fell by 37% (males) and 35% (females) over the period 1996–2005 (Figure 5.5).

Stroke death rates in Australia are low compared with other OECD countries such as Hungary, Portugal, Czech Republic and Korea; but they are 1.4 times as high as in Switzerland, which had the lowest rates overall (OECD 2007).



Note: Age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Mortality Database.

Figure 5.5: Death rates for coronary heart disease and cerebrovascular disease, 1950 to 2005 (*NHPC indicator 1.08*)

Heart failure

Heart failure occurs when the heart functions less effectively in pumping blood around the body. It can result from a variety of diseases and conditions that impair or overload the heart, notably heart attack, high blood pressure or a damaged heart valve. People with mild heart failure may have few symptoms, but in more severe cases it can result in chronic tiredness, reduced capacity for physical activity, and shortness of breath.

Based on 2004–05 National Health Survey self-reports, 263,000 Australians (1.3% of the population) had heart failure or oedema (swelling, which can be a sign of heart failure when it occurs in the lower legs). More than two-thirds of these were females. The prevalence of heart failure or oedema increases with age from 2.5% in people aged 55–64 to 8.2% in those aged 75 years and over.

There are no national data on the incidence of heart failure in Australia. However, applying overseas findings to the Australian population, it has been estimated that around 30,000 new cases are diagnosed each year in Australia (AIHW: Field 2003).

Heart failure accounted for 2,225 deaths in 2005, with 91% of these occurring among people aged 75 years and over. Because females live longer, more females than males (1,390 compared with 835) died of heart failure. The condition is more likely to be listed as an associated cause of death than as the underlying cause—it was mentioned as an associated cause of death in 14,466 cases in 2005. (See Section 2.5 for more information about underlying and associated causes of death.) Heart failure occurs frequently as an associated cause when the underlying cause of death is kidney failure, CHD, diabetes or chronic lower respiratory disease.

In recent years there has been a major decline in mortality from heart failure in Australia. Age-standardised death rates for heart failure as an underlying or associated cause of death fell by 29% for both males and females between 1997 and 2003 (Najafi et al. 2006). It is not clear whether this trend reflects a fall in the incidence of heart failure as a result of reduced incidence of CHD or improved care of people with CHD, or better management of people with heart failure and reduced case fatality.

Acute rheumatic fever and chronic rheumatic heart disease

Both acute rheumatic fever and rheumatic heart disease are preventable causes of ill health and death. They are a major problem in the Indigenous Australian population of northern and central Australia. In contrast, they are very rare in other Australians. Acute rheumatic fever is a delayed complication of untreated throat infection with Group A streptococcus bacteria, but may also follow streptococcal skin sores. The infection and illness occur mainly in children and young adults. Rheumatic heart disease is caused by the long-term damage done to the heart muscle or heart valves by acute rheumatic fever (AIHW: Field 2004).

Acute rheumatic fever is believed to be under-reported, partly because it is difficult to diagnose. Therefore the reported incidence of the disease is likely to underestimate the true incidence (AIHW: Field 2004). Between 2002 and 2006 there were 350 new registrations of people with acute rheumatic fever in the Top End of the Northern Territory and in Central Australia—all registrations in Central Australia and 98% in the Top End were of Indigenous Australians. The incidence of acute rheumatic fever among Indigenous Australians was 1.1 per 1,000 in the Top End and 1.4 per 1,000 in Central Australia. The peak age of incidence is 5–14 years and 55% of cases occurred in this age group in 2002–2006 (AIHW: Penm 2008).

By the end of 2006, there were 1,053 people with chronic rheumatic heart disease registered in the Top End of the Northern Territory and 349 in Central Australia. Almost all of these (91% and 94%, respectively) were Indigenous Australians. Overall, about 65% of Indigenous cases were females and around 60% were aged 15–44 years. After adjusting for differences in age structure of both populations, the prevalence rate of rheumatic heart disease among Indigenous Australians was 35 and 30 times that of other Australians in the Top End of the Northern Territory and in Central Australia, respectively.

In 2005, there were 284 deaths with acute rheumatic fever and rheumatic heart disease recorded as the main cause of death. They were mentioned as an associated cause of death in another 418 death certificates. As would be expected, the death rates for Indigenous Australian males and females because of rheumatic heart disease are far higher than for other Australians—15 and 23 times as high, respectively, over the period 2002–2005 (AIHW: Penm 2008).

Health service use

The treatment and care of people with cardiovascular disease (CVD) covers a variety of settings and phases of care. This section presents data on care provided by general practitioners (GPs), on hospitalisations and on use of medicines.

GP visits

According to the BEACH survey of general practice, cardiovascular conditions are one of the problems most commonly treated by GPs, accounting for 12% of all problems they managed in 2005–06 (Britt et al. 2007). Overall, GPs managed cardiovascular problems at a rate of 16.9 per 100 encounters with their patients.

High blood pressure was the most commonly treated cardiovascular problem, at a rate of 9.4 per 100 encounters, accounting for over half of all cardiovascular problems managed. Lipid disorders (abnormal blood levels of cholesterol or related substances) were managed at a rate of 3.4 per 100 encounters. The management rates of high blood pressure and lipid disorders increased significantly between 1999–00 and 2005–06. Other relatively common cardiovascular problems managed by GPs in 2005–06 were CHD, heart check-ups and the heart rhythm problems of atrial fibrillation or flutter.

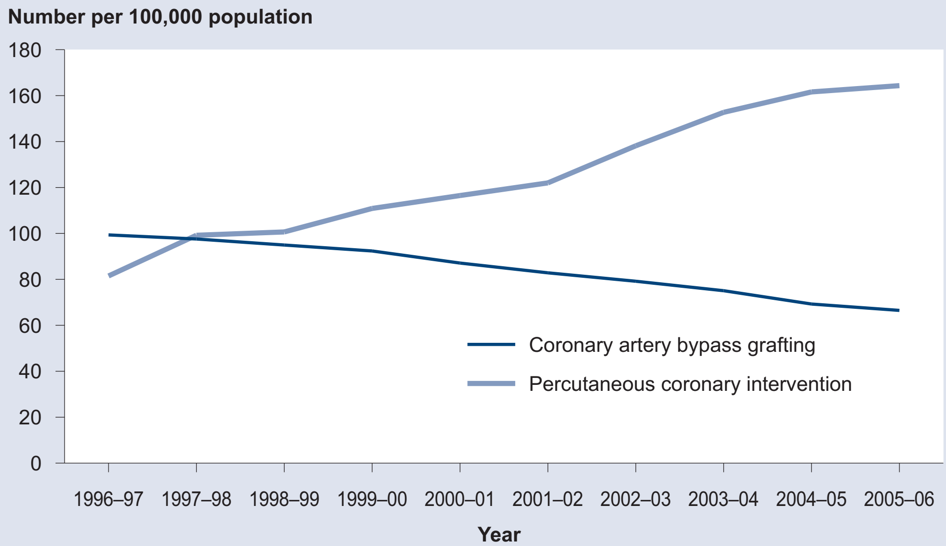
For problems that are chronic in nature, these were among the 20 most frequently managed in general practice overall—high blood pressure (18.5% of all chronic problems), lipid disorders (6.7%), CHD (2.5%), atrial fibrillation or flutter (1.8%) and heart failure (1.2%).

Hospitalisations

CVD was the principal diagnosis for 458,615 hospitalisations (6% of all hospitalisations) in 2005–06. Of these, 35% were due to CHD, 9% to heart failure, 9% to cerebrovascular disease, 6% to peripheral vascular disease and 0.5% to acute rheumatic fever and chronic rheumatic heart disease.

Among those aged 45 years and over, CVD hospitalisation rates for males in 2005–06 were almost twice as high as those for females. The number of hospitalisations for CVD increases rapidly with age, with those aged 55 years and over accounting for 78% of CVD hospitalisations.

The number of hospital procedures to diagnose and treat people with CVD has continued to increase. Prominent among these are coronary angiography, percutaneous coronary interventions (PCI) and coronary artery bypass grafting (CABG). Over the period 1996–97 to 2005–06, there was a doubling in the use of PCI, the term which describes coronary angioplasty and coronary stenting. In contrast, the rate of CABG procedures declined by 33% (Figure 5.6). However, both PCI and CABG are used to remove artery blockages and their combined rate continued to increase over the period.



Note: Age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Hospital Morbidity Database.

Figure 5.6: Trends in cardiovascular procedures, 1996–97 to 2005–06

Use of medicines

Most people need medicines to treat their cardiovascular conditions—65% of people who reported a cardiovascular condition in 2004–05 also reported using medicines for it (ABS 2006a). The rate of GP prescriptions for cholesterol-lowering agents, certain blood-pressure-lowering medicines and clot-preventing medicines increased between 2000 and 2006 (AIHW: Senes & Penm 2007). In 2005–06 there were 67 million government-subsidised prescriptions dispensed for medicines used to prevent or treat CVD (37% of all subsidised prescriptions). Seven cardiovascular medicines were in the ten most commonly used medicines in Australia overall in 2005–06.

These figures reflect both the large numbers of Australians at risk of or with CVD and the chronic nature of the disease: once people start on these medicines, they usually need to use them for life to gain the benefits. However, many people stop taking medicines—10–25% had discontinued their medicines at 6 months from the start of therapy, rising to 21–47% at 24 months (AIHW: Senes & Penm 2007). Reasons for this may include cost, medicine side effects, treating conditions with no symptoms, patients not understanding their condition or the benefits of treatment, and complexity of therapy.

People living in metropolitan areas were dispensed cardiovascular medicines at twice the rate of those in rural areas, and 29–58 times the rate of those in remote areas. This is despite higher death rates from CVD in rural and remote areas compared with Major Cities. These great disparities in supply may relate to problems accessing medical services and medicines in rural and remote areas.

Cardiovascular disease in Indigenous Australians

Aboriginal and Torres Strait Islander peoples develop CVD and die from it at much higher rates than non-Indigenous Australians (AIHW: Penm 2008). The high prevalence of tobacco smoking, overweight and obesity, poor nutrition and diabetes among Indigenous Australians increases their risk of CVD. The presence of multiple cardiovascular risk factors is also very common in adult Indigenous Australians, with 53% of those surveyed in the 2004–05 National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) reporting three or four risk factors (AIHW: Penm 2008). Indigenous Australians are also likely to experience other factors recognised as important contributors to the development of CVD. These include environmental and socioeconomic risk factors, such as poor housing, low income and poverty; and psychosocial stressors, such as the death of a family member or close friend, serious illness or disability and inability to get a job (ABS & AIHW 2005; Bunker et al. 2003; Marmot 2005; van Holst Pellekaan & Clague 2005).

Based on NATSIHS self-reports, 12% of Indigenous Australians had a long-term circulatory condition. Comparing the Indigenous and non-Indigenous populations after adjusting for differences in their age structure, Indigenous Australians were twice as likely to have CHD and 1.6–1.7 times as likely to have cerebrovascular disease, heart failure or hypertension (Table 5.3). Furthermore, the pattern of CVD prevalence among Indigenous Australians was equivalent to that of non-Indigenous Australians who were 10 years older (AIHW: Penm 2008).

Table 5.3: Prevalence of major cardiovascular diseases as long-term conditions in Aboriginal and Torres Strait Islander peoples, 2004–05

Disease	Per cent of Indigenous population	Number of people affected	Indigenous to non-Indigenous rate ratio[(a)]
Coronary heart disease	1.2	5,800	2.1
Cerebrovascular disease	0.3	1,300	1.7
Heart failure	1.0	4,500	1.7
Hypertension	7.0	33,600	1.6
Rheumatic fever and rheumatic heart disease	0.7	3,500	. .
Total cardiovascular disease	**12.0**	**55,900**	**1.3**

(a) Standardised prevalence ratio; that is, the ratio of the observed number of cases to the number of cases expected if Indigenous Australians had the same age- and sex-specific prevalence rates as non-Indigenous Australians.

Note: Based on self-reported information collected in the ABS 2004–05 National Aboriginal and Torres Strait Islander Health Survey.

Source: AIHW: Penm 2008.

Compared with other Australians, in 2002–2003 Indigenous Australians were 3.0 times as likely to suffer a coronary event such as a heart attack, 1.4 times as likely to die from it without being admitted to hospital, and 2.3 times as likely to die from it if admitted to hospital (AIHW: Mathur et al. 2006). In hospital they were less likely to be investigated by angiography and receive coronary angioplasty, stenting or coronary bypass surgery.

CVD is the leading cause of death for Indigenous Australians, accounting for 27% of all deaths in 2002–2005. After adjusting for age differences, Indigenous males were twice as likely to die from CVD as females.

In 2002–2005, Indigenous Australians were three times as likely to die from CVD as their non-Indigenous counterparts. This disparity was evident for CHD, cerebrovascular disease and heart failure but was most marked for rheumatic fever and rheumatic heart disease (Table 5.4). Indigenous Australians were also more likely to die from CVD at younger ages than non-Indigenous Australians.

Table 5.4: Average annual deaths from cardiovascular diseases for Aboriginal and Torres Strait Islander peoples(a), 2002–2005(b)

	Indigenous Australian males		Indigenous Australian females	
	Number of deaths(c)	SMR(d)	Number of deaths(c)	SMR(d)
Coronary heart disease	140	3.3	83	2.8
Cerebrovascular disease	28	2.1	33	1.8
Heart failure	4	2.1	7	2.4
Rheumatic fever and rheumatic heart disease	5	15.0	13	23.0
Total cardiovascular diseases	**217**	**3.1**	**170**	**2.7**

(a) Data are for Indigenous deaths for usual residents of Queensland, Western Australia, South Australia and Northern Territory.

(b) Deaths are based on year of occurrence of death for 2002–2004 and year of registration of death for 2005.

(c) The number of deaths has been averaged over the period 2002–2005.

(d) SMR (standardised mortality ratio) is the ratio of the observed number of deaths to the number of expected deaths if Indigenous Australians had experienced the same age- and sex-specific death rates as non-Indigenous Australians.

Note: All ratios are significantly different from those for non-Indigenous Australians.

Source: AIHW: Penm 2008.

5.3 Diabetes

Diabetes mellitus (diabetes) is a chronic metabolic disease marked by high levels of glucose in the blood, which is a result of too little insulin (a hormone produced by the pancreas to control blood glucose), insulin becoming ineffective, or both. Diabetes is on the rise in Australia and across the world, and according to estimates from the Australian Diabetes, Obesity and Lifestyle Study (AusDiab study), in 1999–2000 it affected nearly 900,000 Australians aged 25 years and over. Recent increases in the number of people with diabetes have led to claims that it has now risen to 'epidemic' proportions (Colagiuri et al. 2005).

If left undiagnosed or poorly controlled, diabetes can lead to a range of complications including coronary heart disease, peripheral vascular disease, stroke, diabetic neuropathy, renal failure, amputations and blindness. Together with these complications, diabetes places a large burden on the affected individuals, their families and the community.

Diabetes accounted for the second and fourth highest disease burden for males and females respectively in 2003 and as a cause of death was ranked fifth for males and seventh for females in 2005.

There are several types of diabetes with different causes and clinical histories. The three main types are Type 1, Type 2 and gestational diabetes (Box 5.4).

Box 5.4: Main types of diabetes

Type 1 diabetes mostly arises in children or young adults, although it can occur at any age. It is marked by the inability to produce insulin. People with Type 1 diabetes need insulin replacement for survival. Type 1 accounts for around 10–15% of all diabetes cases.

Type 2 diabetes is the most common form of diabetes, occurring mostly in people aged 50 years and over. Although uncommon in childhood, it is becoming increasingly recognised in that group. People with Type 2 diabetes produce insulin but may not produce enough or cannot use it effectively. Type 2 diabetes may be managed with changes to diet and exercise, oral glucose-lowering drugs, insulin injections, or a combination of these.

Gestational diabetes is a form of diabetes that develops during pregnancy in some females. It involves high blood sugar levels appearing for the first time during pregnancy among females who have not previously been diagnosed with other forms of diabetes. It usually disappears after the baby is born, but it can recur in later pregnancies. It is also a marker of increased risk of developing Type 2 diabetes later in life. Some cases of gestational diabetes are managed with changes to diet and exercise alone and some require insulin treatment.

Risk factors for diabetes

Risk factors for diabetes differ by type of diabetes. Type 1 diabetes is believed to be caused by particular biological interactions and exposure to environmental agents among genetically predisposed people (Atkinson & Eisenbarth 2001). Age is a risk factor for Type 2 diabetes and another strong factor is a genetic predisposition shown by family history and ethnic background. Several modifiable risk factors also play a role in Type 2 diabetes—notably obesity, physical inactivity and an unhealthy diet (Shaw & Chisholm 2003). The metabolic syndrome—the clustering of a number of risk factors including abdominal obesity, impaired fasting blood glucose levels, raised blood pressure, raised blood triglycerides and reduced blood HDL cholesterol—substantially increases the risk of Type 2 diabetes (Chew et al. 2006). The risk factors for gestational diabetes are mostly similar to those for Type 2 diabetes, with females being at higher risk if they are in an older age group or obese when they are pregnant (Virjee et al. 2001).

Incidence

Good information on the incidence of Type 1 diabetes in Australia is available from the National Diabetes Register (NDR). The register also provides information on other types of diabetes for the subset of cases where insulin is used to treat the disease (see Box 5.5).

In 2005, 901 new cases of Type 1 diabetes in children aged under 15 years were recorded. This equates to an annual incidence of 22.6 cases per 100,000 population (around 1 in 4,000) in this age group and represents a 20% increase in the rate of new cases compared with that in 2000 (19.2 per 100,000 population). This increase in the incidence of Type 1 diabetes in Australian children is consistent with international trends (DIAMOND Project Group 2006) as well as with the findings of previous Australian studies.

The NDR also records new cases of Type 1 diabetes among adults. In 2005, there were 788 new cases of Type 1 diabetes in people aged 15–39 years, equating to an incidence rate of 10.9 cases per 100,000 population.

Box 5.5: National Diabetes Register

The National Diabetes Register (NDR) is a confidential database established in 1999 to collect information about new cases of insulin-treated diabetes—that is, all new Type 1 diabetes cases and all other new cases of individuals needing insulin treatment, whether Type 2, gestational or other types. The register is operated by the AIHW, using data from the National Diabetes Services Scheme and the Australasian Paediatric Endocrine Group.

The NDR holds diabetes-related information on all cases for which the insulin treatment began on or after 1 January 1999. This means that the register should cover all new cases of Type 1 diabetes since 1999 because they all require insulin treatment. However, not all Type 2 and gestational diabetes cases require insulin treatment so those that do not are excluded.

For children aged 0–14 years, the NDR receives information about new cases of insulin-treated diabetes from two sources, providing reliable estimates of Type 1 diabetes incidence in this age group, with an estimated coverage rate of more than 96%. With ethics approval, researchers are now able to use the register as an important source of information for clinical and population studies of the causes, complications and patterns of diabetes.

Of the 76,000 people who were registered on the NDR in 2005, around 69% were found to have Type 2 diabetes and 18% Type 1. At diagnosis, 56% of registrants were aged 45 years or over and 8% were aged under 15 years (AIHW: Catanzariti et al. 2007).

Between 1999 and 2005, an estimated 100,400 persons began using insulin to treat their Type 2 diabetes. The NDR registers only those requiring insulin, so this estimate does not include people with Type 2 diabetes who are not using insulin to manage their diabetes.

Gestational diabetes is estimated to occur in about 5% of pregnancies in Australia each year (ADIPS 2007). Estimates of gestational diabetes incidence can also be obtained from data on hospitalisations. During 2005–06, about 12,400 (4.6%) of those females who gave birth in hospital had diagnosed gestational diabetes, with 33.7% of cases occurring in females aged 35 years and over.

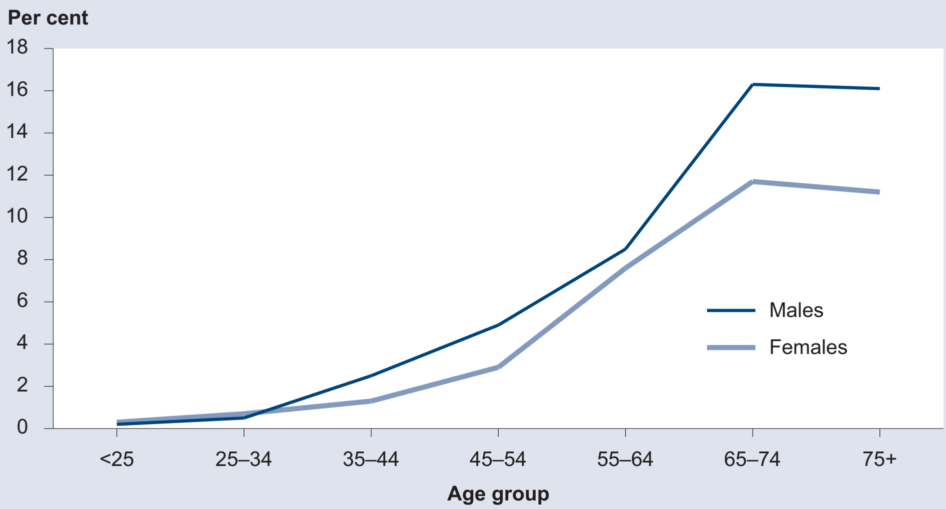
Prevalence

There are two main sources of national diabetes prevalence data in Australia. The first is the 1999–2000 Australian Diabetes, Obesity and Lifestyle Study (AusDiab study), in which diabetes prevalence was estimated on the basis of measured blood glucose levels. The second is the ABS National Health Survey (NHS), in which prevalence estimates are based on self-reported information.

Measured data such as those collected in the AusDiab study provide more accurate assessment of diabetes status in an individual. In addition, measured data can be used to estimate prevalence according to whether cases had already been diagnosed or not. The accuracy of self-reported data, such as those collected in the NHS, relies on respondents being aware of and accurately reporting their health status, and therefore previously undiagnosed cases of diabetes will not be counted. However, the NHS is conducted regularly so it provides relatively recent information and should be useful for producing trends on the prevalence of diabetes. The accuracy of prevalence estimates from surveys will depend on both the collection method—such as blood measurements or self-reported information—and other factors including the response rate achieved in a survey.

Based on measured data from the AusDiab study, it has been estimated that 880,000 Australian adults aged 25 and over had diabetes in 1999–2000, or 7.4% of adults (more than 1 in 14). About half these people were not aware that they had diabetes.

From self-reported data in the 2004–05 NHS, over 700,600 Australians of all ages (3.6% of the population) had been diagnosed with diabetes. Among people with diabetes, 13% reported having Type 1 diabetes and 83% reported having Type 2; a further 3.6% did not know which type they had. The proportion of people with diagnosed diabetes increased with age, and the highest prevalence rate was for those aged 65–74 years (Figure 5.7). Males had a higher rate of diabetes than females (4% and 3% respectively).



Note: Based on self-reported data.

Source: AIHW analysis of the ABS 2004–05 National Health Survey.

Figure 5.7: Age-specific prevalence of diagnosed diabetes by sex, 2004–05

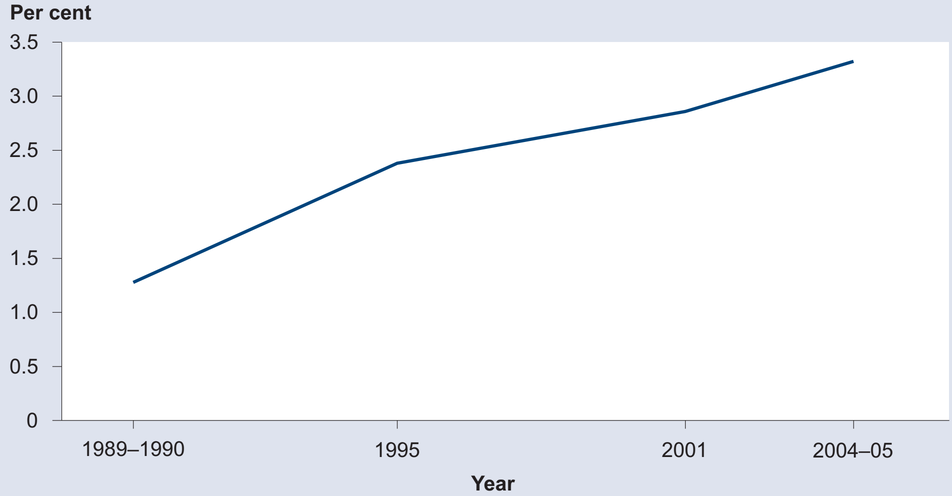
Population groups

Aboriginal and Torres Strait Islander peoples have markedly higher rates of diabetes (specifically Type 2) compared with other Australians. According to the 2004–05 National Aboriginal and Torres Strait Islander Health Survey, an estimated 29,900 Indigenous people had diabetes/high-sugar level—around 6% of the total Indigenous population. The age-standardised prevalence of diabetes among Indigenous people was almost 3 times as high as that of non-Indigenous Australians (11% and 4% respectively) (ABS 2006b).

Data from the 2004–05 NHS show that there are also higher rates of diabetes among other sections of the Australian community, namely those living in more remote areas, those with lower socioeconomic status, and those born overseas (AIHW 2008).

Trends

The prevalence of diagnosed diabetes in Australia based on self-reported information has more than doubled since 1989–90 (Figure 5.8). Although an increase in the incidence of diabetes may play a major role in trends in diabetes prevalence, rising awareness in the community, better detection and better survival may also help explain them.



Notes

1. Age-standardised to the Australian population as at 30 June 2001.
2. Based on self-reported data.

Sources: AIHW analysis of the 1989–90, 1995, 2001 and 2004–05 ABS National Health Surveys.

Figure 5.8: Trends in the prevalence of diabetes, 1989–90 to 2004–05

Estimates of diabetes prevalence from measured data show a similar trend; the prevalence of diabetes in the 1999–2000 AusDiab study was more than double that estimated from the 1981 Busselton survey (Dunstan et al. 2002).

Complications of diabetes

Diabetes complications can arise quickly or develop over a number of years. Short-term complications are considered a medical emergency and may lead to coma and death in a short time. These include a condition known as diabetic ketoacidosis that can occur from a severe lack of insulin in those with Type 1 diabetes and another condition called hypoglycaemia (low blood glucose) that is a complication of insulin treatment. There is limited statistical information about short-term complications, although it has been found that 4.6% of people with diabetes who attended specialist diabetes services in 2004 had suffered at least one episode of severe hypoglycaemia in the previous 12 months (Flack & Colagiuri 2005).

Long-term complications include disease of large blood vessels (macrovascular disease) that leads to conditions such as coronary heart disease, stroke and peripheral vascular disease; and disease of small blood vessels (microvascular disease) that can cause chronic kidney disease, nerve damage and retinopathy (loss of vision). From the 2004–05 NHS, the prevalence rates of stroke and heart attack among people with diabetes were twice as high as the rate among those without diabetes and the rate of angina was 2.6 times as high. Specific eye health problems such as glaucoma, cataract and blindness were also more commonly reported by people with diabetes than by those without it (2.4, 1.5 and 1.3 times respectively).

Type 2 diabetes is also the most common cause of severe kidney disease. In 2005, 697 Australians began kidney replacement therapy (dialysis or kidney transplant) due to diabetic nephropathy, accounting for 32% of all new cases registered in the Australia and New Zealand dialysis and kidney transplant registry for that year (McDonald et al. 2006).

This represents an increase in the proportion of new cases of end-stage kidney disease caused by diabetes, from 25% in 2001. Of all people beginning kidney replacement therapy in 2005, 41% had diabetes, the majority Type 2.

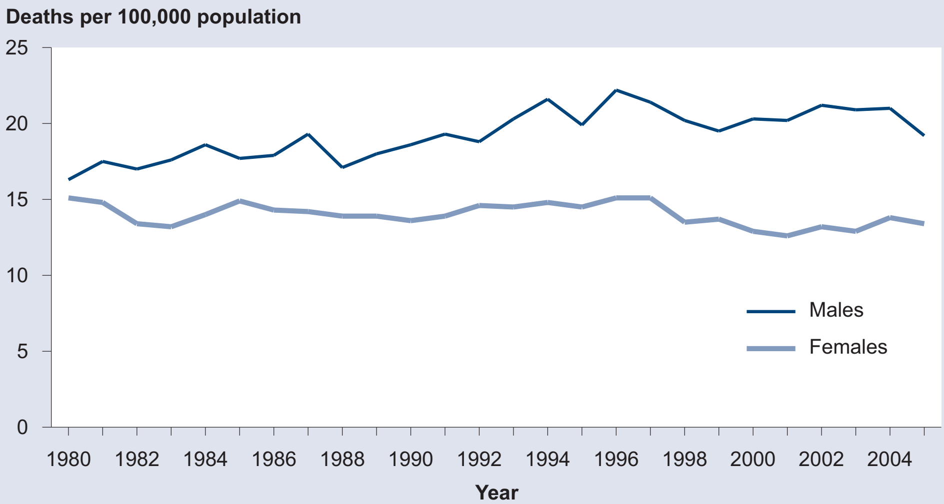
Among people attending specialist diabetes services in 2004, 9.0% gave a history of at least one episode of heart attack, 5.1% had had a stroke and 12.4% had peripheral vascular disease (reduced blood flow to the legs). In addition, 1.1% had been diagnosed with end-stage kidney disease, 1.1% were blind and 1.1% had had a lower limb amputation (Flack & Colagiuri 2005). It is important to note that specialist diabetes clinics are likely to see more patients with complications than would be seen among people with diabetes generally.

Mortality

A total of 11,864 deaths in Australia in 2005 were caused to some degree by diabetes. It was listed as the underlying cause of 3,529 deaths (2.7% of all deaths) and as an associated (contributory) cause in 8,335 deaths (6.4% of all deaths).

Where diabetes was the underlying cause of death, common conditions listed as associated causes included coronary heart diseases (in 67% of cases), kidney-related diseases (30%), stroke (20%) and heart failure (20%). When diabetes was listed as an associated cause, coronary heart disease was listed as the underlying cause of death in 28% of cases, cancer in 25% and stroke in 8%.

There have not been major changes in the death rate from diabetes (as an underlying cause) over the last 25 years (Figure 5.9), although there have been some differences for males and females. For males, the death rate rose by an average of 0.7% per year. In contrast, the rate for females fell by an average of 0.5% per year.



Notes

1. Age-standardised to the Australian population as at 30 June 2001.
2. For 1980 to 1996 the disease grouping is classified according to the ICD-9 code: 250 for diabetes.
3. For 1997 to 2005 the disease grouping is classified according to the ICD-10 codes: E10–E14 for diabetes.

Source: AIHW National Mortality Database.

Figure 5.9: Deaths with diabetes as the underlying cause of death, 1980 to 2005 (*NHPC indicator 1.08*)

The death rate for diabetes increases progressively with age; about 87% of people who died with diabetes in 2005 were aged 65 years and over. Males were more likely to die from diabetes than females, with age-standardised death rates of 68 and 43 per 100,000 people respectively.

Disability and functioning

Based on the 2003 Survey of Disability Ageing and Carers, an estimated 56% of people with diabetes also had a disability. Of them, 42% had a profound or severe core activity limitation, indicating that they were unable to do, or always/sometimes needed help with, a task such as self-care, mobility and communication. Disability among people with diabetes was higher at older ages: 67% of such people aged 65 years and over reported a disability compared with 46% of those aged less than 65 years. Twenty four per cent of people with diabetes and a disability reported diabetes as the main condition causing their disability in 2003.

Burden of disease

Using a conservative estimate, diabetes was held responsible for nearly 6% of the total disease burden in 2003, making it the eighth leading cause of burden of disease and injury in Australia. However, diabetes increases the risk of coronary heart disease and stroke, and when this contribution is added, the burden attributable to diabetes increases to 8.3%, ranking it fourth out of all diseases (Begg et al. 2007).

In 2003, Type 2 diabetes accounted for 92% of the diabetes burden. It was ranked sixth among the 20 leading causes of burden for both males and females in 1993 and by 2003 it was ranked second for males and fourth for females. Type 2 diabetes is projected to be the leading specific cause of disease burden for males and second for females by 2023.

Health service use

The first aim of diabetes management is to prevent complications, mainly by maintaining normal blood glucose levels. The second is to detect and treat any complications early. This requires frequent attention and monitoring by patients, their doctors and other health professionals.

People with diabetes are therefore more likely than others to consult health professionals or use hospital services. Recent data suggest that health service use by people with diabetes is increasing. This may reflect the increasing prevalence of diabetes, but may also be because of greater compliance with guidelines for diabetes management and rising awareness of diabetes and its complications.

GP visits

According to the 2005–06 BEACH survey, diabetes was the third most frequently managed chronic condition and represented 2.4% of all problems managed by GPs, at a rate of 3.5 per 100 encounters (Britt et al. 2007). There has been a gradual increase in this proportion since 1999–00, when the corresponding figure was 1.8% (a rate of 2.7 per 100 encounters).

Diabetes was the problem most frequently referred by GPs to specialists and other health professionals in 2004–05: 6.9% of all diabetes encounters resulted in a referral to a specialist and 4.9% in a referral to an allied health professional (Britt et al. 2007).

Hospitalisations

Diabetes was the principal diagnosis for 80,380 hospitalisations in 2005–06 and an additional diagnosis for 506,355 hospitalisations. These almost 600,000 events can be termed diabetes-associated hospitalisations and they accounted for 8% of all hospitalisations in that year. The rates increased with age, with 53% of hospitalisations occurring among people aged 65 years and over.

As well as diabetes accounting for a large proportion of hospitalisations, the average length of stay for such cases was longer than the overall average—4.8 days for diabetes as the principal diagnosis and 5.7 days as the additional diagnosis, compared with 3.3 days for all hospitalisations.

The reasons for hospitalisations for people with diabetes are diverse. Diseases of the circulatory system were the most common principal diagnoses for those with diabetes (16% of all diabetes-associated hospitalisations). When diabetes was the principal diagnosis, about 32% of hospitalisations were for eye complications (ophthalmic), 13% for multiple complications, just over 9% for diabetes in pregnancy and 9% for poor control. When diabetes was listed as an additional diagnosis, multiple complications were more common (43%).

Hospitalisation rates involving any diagnosis of diabetes increased by 42% between 2000–01 and 2005–06, from 1,932 to 2,744 hospitalisations per 100,000 people. This increase is also represented in the proportion of hospitalisations involving diabetes: in 2000–01, diabetes contributed to 6% of the total hospitalisations and by 2005–06 this had risen to 8%.

International comparisons

Australia has a relatively low prevalence of overall diabetes compared with other OECD countries, ranking the third lowest in 2006, with an estimated 5% of the population aged 20–79 years having diabetes (IDF 2006).

However, Australia's incidence of Type 1 diabetes among 0–14 year olds in the late 1990s to early 2000s was the fourth highest in the range of estimates for OECD countries, with around 23 per 100,000 (IDF 2006).

5.4 Chronic kidney disease

Chronic kidney disease (CKD) is the occurrence of kidney damage and/or reduced kidney function, lasting for 3 months or more. In severe cases, kidney function may deteriorate to the extent that it is no longer sufficient to sustain life and, if untreated, will cause death within a few weeks. This is called 'end-stage kidney disease' (ESKD). People with ESKD require kidney replacement therapy (KRT)—either dialysis or kidney transplant—to survive.

Risk factors and causes

A variety of factors may contribute to the development of CKD. The major risk factors include diabetes, high blood pressure, glomerulonephritis, urinary tract infections and drug toxicity. Other factors, such as tobacco smoking, ageing, genetic makeup, physical inactivity, and low socioeconomic status may also contribute (AIHW 2005a). The most common reasons for people starting KRT in 2005 were diabetes (32%), glomerulonephritis (23%) and high blood pressure (15%) (McDonald et al. 2007).

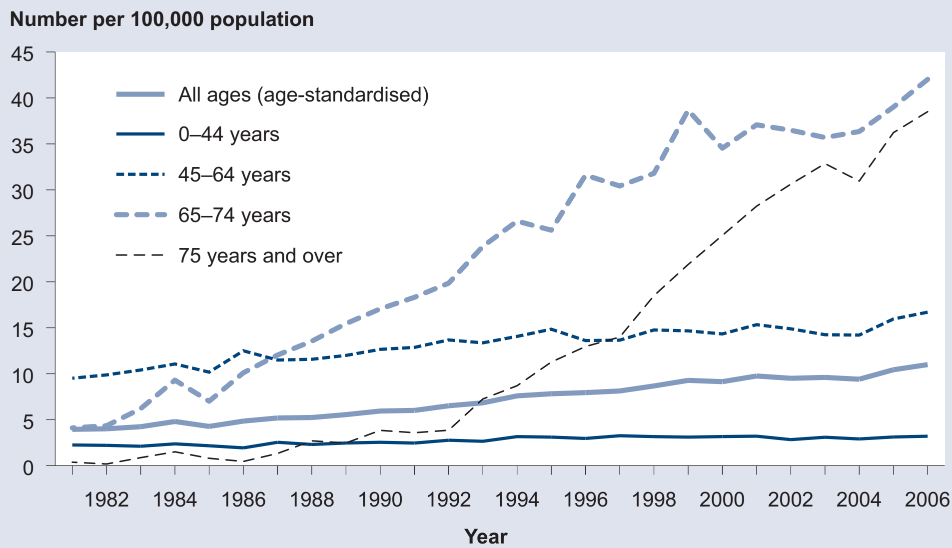
Incidence and prevalence

It is not clear how many Australians have CKD. As it has few specific symptoms, it often remains undetected until the late stages, and many people may not know that they have it. Any self-reported information, therefore, will underestimate its prevalence. The 1999–2000 AusDiab study found that about 7.5% to 11.2% of Australians aged 25 years and over had evidence of reduced kidney function, and a further 5.1% had evidence of protein and/or blood in their urine, indicating possible kidney damage (Chadban et al. 2003, Australasian Creatinine Consensus Working Group 2005).

Treated end-stage kidney disease

Information on people receiving KRT for ESKD in Australia is compiled by the Australia and New Zealand Dialysis and Transplant (ANZDATA) Registry. According to this, 2,378 persons (1,441 males and 937 females) began KRT in Australia in 2006. The rate of new patients increased with age, being highest among 65–74 year olds (39 per 100,000 population). The average age of patients beginning treatment in 2006 was 60.7 years (McDonald et al. 2007), well above the average of 42.3 years in 1981.

The number of new KRT patients has been increasing over the last 25 years. However, this increase has not been seen across all age groups. Under the age of 45 years, incidence rates of treated ESKD are relatively stable, but rapid increases have occurred among the older age groups (Figure 5.10). Major contributors to this increase are the increasing prevalence of diabetes, reduced cardiovascular mortality and a greater readiness to offer this treatment to older people.



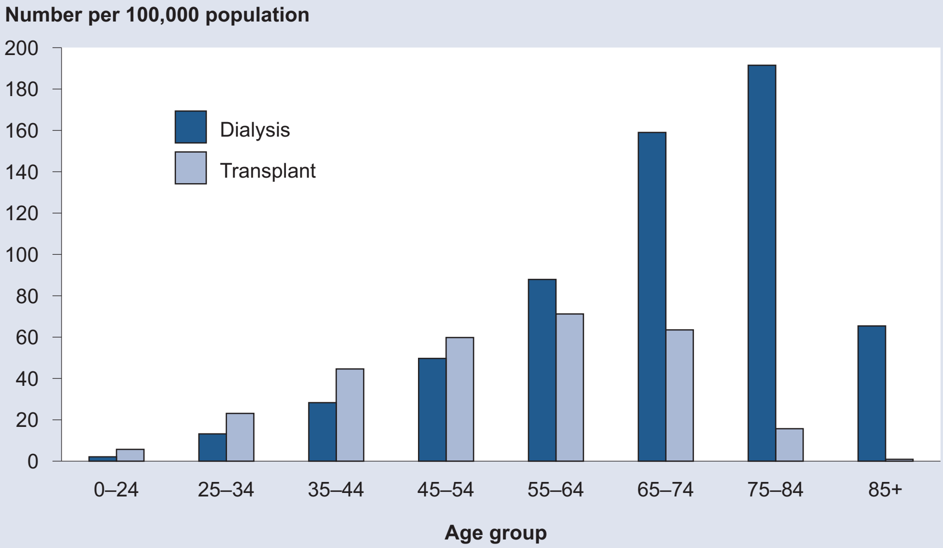
Note: Age-standardised to the Australian population at 30 June 2001.

Source: AIHW analysis of ANZDATA Registry data.

Figure 5.10: Trends in new cases of kidney replacement therapy for treating end-stage kidney disease, 1981 to 2006

At the end of 2006, 9,182 Australians were having dialysis and a further 6,845 were living with a kidney transplant (McDonald et al. 2007). The rate of functioning transplants was greatest among those aged 55–64 years (71 per 100,000 population), whereas dialysis was most common among those aged 75–84 years (192 per 100,000) (Figure 5.11).

As with the incidence, the prevalence of treated ESKD has greatly increased over the past 25 years, more than tripling from 22 per 100,000 population in 1981 to 74 in 2006. Although some of this increase may be attributed to a greater incidence of ESKD and increased numbers of patients beginning treatment, improved management of other illnesses and new technologies have also contributed to these numbers by increasing patient survival.



Source: McDonald et al. 2006.

Figure 5.11: Prevalence of kidney replacement therapy, by age and treatment type, 2006

Complications and comorbidities

Loss of kidney function can have serious effects on the body, causing damage to other organs and disruption of bodily processes. This can lead to various complications including heart disease, infections and problems with the bones and muscles. The impairments of other organ systems can be detected at the early stages, and the risk of such impairments increase progressively with worsening kidney function (Johnson 2004). As well as diseases that are complications of CKD, people with CKD may have diseases that have arisen independently, or through a common risk factor such as high blood pressure. The overall burden of the comorbidity and the various complications of CKD has not yet been well studied. However, records of hospitalisations and deaths among Australian adults show that CVD and diabetes often coexist with CKD (Table 5.5).

Table 5.5: Comorbidity of CKD with CVD and diabetes: hospitalisations and deaths

Type of record	With CVD (without diabetes)	With diabetes (without CVD)	With CVD and diabetes
		Per cent	
Hospitalisations with a diagnosis of CKD in 2004–05[(a)]	32.8	6.1	36.9
Deaths with CKD as a cause of death in 2004	59.7	2.7	16.3

(a) Hospitalisations for regular dialysis were excluded from this analysis.

Note: Only people aged 18 years and over are included.

Source: AIHW: Tong & Stevenson 2007.

Mortality

CKD contributes significantly to mortality. People with CKD have an increased risk of death in the early stages compared with people without the disease, and this risk increases progressively with worsening kidney function. At the end stage of the disease, people without kidney replacement therapy will die in a few weeks because of uraemia—the damaging build-up in the blood of urea and related waste products, which the kidneys would normally eliminate through the urine. CKD also contributes to death by increasing the risk of death from other diseases, such as CVD and infection.

In 2005, CKD was recorded as contributing to 11,954 deaths (6,367 males and 5,587 females), which represents over 9% of total deaths in Australia. Among these deaths, CKD was recorded as the underlying cause in 2,426 cases (a fifth of the total) and as an associated cause in 9,528 cases.

From 1997 to 2005, the mortality rate for CKD as the underlying cause of death fell from 13 to 11 deaths per 100,000 population. In the same period, the death rates where CKD was recorded as an associated cause of death remained at about 43 deaths per 100,000 population.

Health service use

Management of chronic kidney disease aims to slow or halt further deterioration of function and to prevent complications. This may involve lifestyle modifications, regular check-ups, use of medications and kidney replacement therapy. As with most chronic conditions, day-to-day management is generally provided by a GP or specialist, whereas acute illness and treatment of end-stage disease may require hospital services.

GP visits

The BEACH survey found that chronic kidney disease was managed at a rate of around 2 per 1,000 GP encounters in 2005–06. This equates to around 177,401 Medicare-reimbursed GP consultations in that year. The kidney problem most commonly managed by GPs was described as 'chronic kidney failure'.

Hospitalisations

People with CKD, particularly those at the later stages, require a large number of hospital services. The most frequent reason for hospitalisation among these people is day-admission for dialysis. In 2005–06, day-admission for dialysis was the leading cause of hospitalisation in Australia, with a total of 883,593 hospitalisations (12.1% of all hospitalisations). These high numbers reflect the need for those having dialysis to receive it three to four times per week.

Besides day-admission for dialysis, people with CKD are also hospitalised for other treatment. In 2005–06, there were 28,955 such episodes of care (0.4% of total hospitalisations), where CKD was recorded as the principal diagnosis. The average length of stay was 4.6 days, well above the average length of stay for all hospitalisations (3.3 days).

In addition, many hospitalisations were attributed to the clinical management of comorbidities of CKD and complications of KRT. These hospitalisations were more likely to record CKD as an additional diagnosis. In 2005–06, there were 145,746 of these (2.0% of all hospitalisations). The common principal diagnoses recorded included CVD (32,359), respiratory diseases (12,083) and diabetes (8,206).

Kidney replacement therapy

Despite increases in the number of older patients and patients with comorbidities, better management and advances in technology have led to increases in the proportion of people receiving dialysis (AIHW 2005a; McDonald et al. 2007).

In addition, people with ESKD also survive longer after kidney transplant. For patients who received a kidney from a deceased donor in 1999–2000, 95% of them survived more than 1 year and 90% survived more than 5 years. This is higher than the 93% and 84% respectively in 1991–1992. For patients who received a kidney from a live donor, besides the nearly 100% survival rate after 1 year of transplantation, the 5-year survival rate also improved from 86% in 1991–1992 to 95% in 2000–2001 (McDonald et al. 2007).

However, choices of treatment and access to kidney transplant were reduced in around 23% of patients because they were referred to kidney physicians too late. There is also a long waiting list for kidney transplant. At the end of 2006, 1,344 people were waiting for a kidney transplant, and 92% of them were aged under 65 years (McDonald et al. 2007).

Chronic kidney disease in Indigenous Australians

Data on the prevalence of CKD among Aboriginal and Torres Strait Islander peoples are limited to self-reported information, with no large-scale Indigenous biomedical surveys having been done. From the 2004–05 ABS National Aboriginal and Torres Strait Islander Health Survey, an estimated 7,500 (3%) Indigenous Australians aged 18 years and over had kidney disease as a long-term condition (AIHW: Penm 2008). Note that some kidney diseases may not cause permanent damage to kidney function or kidney structure despite being long-term, and that the 2004–05 survey did not collect information from health-care facilities. For these reasons, the survey estimates are unlikely to fully reflect the prevalence of chronic kidney disease in the Indigenous population.

End-stage kidney disease is much more common among Indigenous Australians than among other Australians. According to the ANZDATA Registry, 207 (8.7%) patients beginning kidney replacement therapy in 2005 were Indigenous, compared with Indigenous representation of 2.5% among the total Australian population. At the end of 2005, 1,041 Indigenous Australians relied on this therapy to survive. Overall there were nearly five times as many Indigenous cases of treated ESKD as would be expected from Australia's national prevalence rate.

CKD also contributed greatly to hospital use and mortality in this population. Based on data from Queensland, Western Australia, South Australia and the Northern Territory, CKD was recorded as the principal diagnosis in 46% of hospitalisations of Indigenous Australians in 2005–06, and was recorded as a cause of death (as either the underlying or an associated cause of death) in 14% of Indigenous deaths in 2005. These hospitalisation and mortality rates for CKD among Indigenous Australians were much higher than among other Australians in these jurisdictions.

5.5 Chronic respiratory diseases

Chronic obstructive pulmonary disease

Chronic obstructive pulmonary disease (COPD) is a serious, progressive and disabling disease in which destruction of lung tissue and narrowing of the air passages obstructs oxygen intake, causing chronic shortness of breath. The person is also prone to episodes where shortness of breath is more severe and he or she has fits of coughing with mucus. The lung damage is mainly due to the long-term inhalation of irritant gases and particles, and by far the main cause of this is cigarette smoking.

The main pattern of COPD is known as emphysema but if the person's cough is a fairly constant feature the condition is often labelled as chronic bronchitis.

Risk factors

Tobacco smoking is by far the most important risk factor for COPD. It is estimated that 82% of global deaths due to COPD are attributable to smoking (Zaher et al. 2004). Based on estimates from the Australian Burden of Disease and Injury Study (Begg et al. 2007), about 73.4% of COPD deaths in Australia in 2003 could be attributed to tobacco smoke.

Other risk factors for COPD may worsen respiratory symptoms or may contribute to the risk of developing the disease, either independently or in conjunction with tobacco smoking. These include respiratory infections (see Box 5.6) and exposure to environmental (passive) tobacco smoke, indoor and outdoor air pollution, and occupational dusts and chemicals (Chapman et al. 2006; Rennard 1998).

Prevalence

The prevalence of COPD in Australia is difficult to determine. Definitions of the disease can vary and the term COPD is not commonly used in health surveys (Mannino et al. 2002). Instead, prevalence calculations are often based on combining separate estimates for emphysema and bronchitis (sometimes with no distinction between chronic and acute bronchitis).

From self-reports in the 2004–05 National Health Survey (NHS), about 591,000 persons (3% of the Australian population) were estimated to have emphysema and/or bronchitis—down from 665,000 persons in 2001. The self-reported prevalence of emphysema/bronchitis among those aged 65 years and over is about 8%. For people aged 65 years and over, emphysema/bronchitis is more common in males than in females.

It is possible that the NHS overestimates the prevalence of COPD in younger people. The approach taken by the ABS for the survey is to include bronchitis as a 'long-term condition' rather than to specify and define 'chronic bronchitis'. Long-term bronchitis may be interpreted as recurring episodes of acute bronchitis (Mannino 2001). On the other hand, the NHS probably underestimates the prevalence in older people. This is because the symptoms of COPD overlap with those of other conditions (such as asthma) and COPD is usually not diagnosed until it is moderately advanced and begins to restrict a person's daily activities.

Direct comparisons with the prevalence of COPD in other countries are difficult to make because of differences in how the disease is defined and how data are collected. An international survey of people aged 20–44 years ranked Australia third out of 16 high-income countries in the prevalence of mild COPD, with 4.3%, and fourth in the prevalence of moderate to severe COPD, with 1.4% (de Marco et al. 2004). However, Australia had the lowest prevalence of those considered 'at risk' (some chronic symptoms but no airflow obstruction), with 7.2%.

Box 5.6: Influenza and pneumococcal vaccination for people with COPD

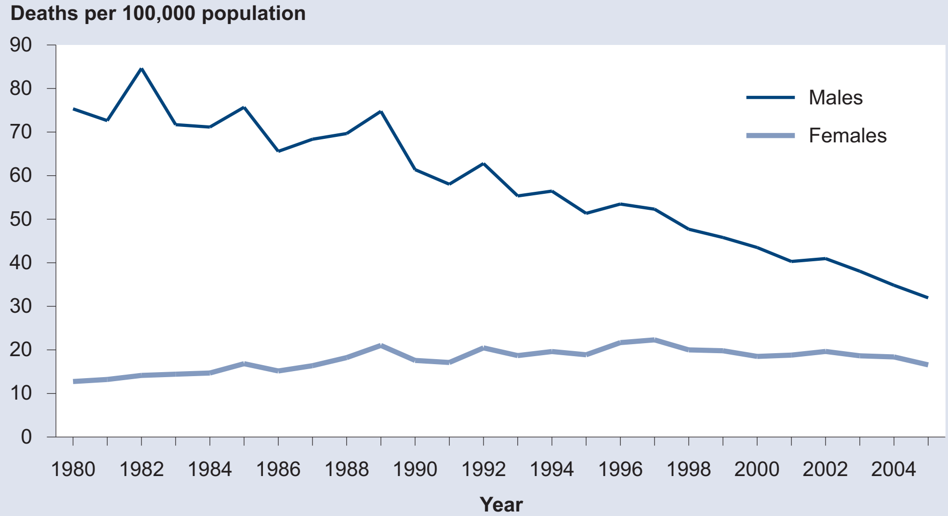
Influenza and pneumonia can worsen the symptoms of COPD, decrease lung function, and lead to hospitalisation or, in severe cases, death. These risks can be reduced significantly by vaccination (see Chapter 4 for more information).

Estimates from the National Health Survey (NHS) suggest that people with COPD are more likely than others to receive influenza and pneumococcal vaccination. From self-reports in the 2004–05 NHS among people aged 65 years and over, 88% of those with emphysema/bronchitis had been vaccinated against influenza in the previous 12 months, compared with 72% of others. This proportion had remained stable since 2001. However, only 61% of respondents with emphysema/bronchitis reported being vaccinated against pneumococcal infection in the previous 5 years, compared with 41% of those without emphysema/bronchitis.

Mortality

COPD is a major cause of death in Australia, reflecting the progressive decline in lung function associated with the disease. In 2005, COPD was the underlying cause of 4,886 deaths (45.2% of deaths due to respiratory diseases and 3.7% of all deaths). It was also listed more than 7,000 times as an associated cause of death, most often when coronary heart disease or lung cancer was the underlying cause. The death rate among males was almost double the female rate (age-standardised rate of 31.2 deaths per 100,000 population for males and 16.3 for females).

Overall, the death rate for COPD fell over the 25 years to 2005 (Figure 5.12). In males, the age-standardised death rate fell every year for the latest 10 years, except in 2002 (during which there was a small rise). In females, the rate appeared to level off after peaking in 1997, until a small fall in 2005.



Notes

1. Age-standardised to the Australian population as at 30 June 2001.
2. COPD classified according to ICD-9 codes 491, 492, 496 (1980–1996) and ICD-10 codes J41 to J44 (1997–2005).
3. Rates for 1980–1996 have been adjusted by a factor of 0.93 to be comparable with 1997–2005 rates.

Source: AIHW National Mortality Database.

Figure 5.12: Trends in COPD mortality, by sex, 1980 to 2005

Burden of disease

COPD was estimated to account for 3.3% (3.6% among males and 3.0% among females) of the total burden of disease and injury in Australia in 2003 (Begg et al. 2007). The proportion of the total burden of disease and injury associated with COPD increases with age among males, but peaks at 65–74 years among females. Due mainly to declining smoking rates, especially among males, the proportion of the total burden of disease and injury associated with COPD is projected to fall to 2.2% for males and 2.8% for females by 2023 (Begg et al. 2007).

Health service use

COPD may require regular hospital care when symptoms worsen, lead to increased disability or become life-threatening. There were 53,726 hospitalisations in 2005–06 with COPD as the principal diagnosis. The average length of stay in the hospital for COPD in 2005–06 was 7.1 days compared with 4.2 days for all respiratory diseases. A large proportion (87%) of COPD hospitalisations followed an emergency admission. Hospitalisations for COPD occur mainly among the elderly, with those aged 65 years and over accounting for 77% of them. Males are more likely than females to be hospitalised for COPD; however, the age-standardised hospitalisation rate in males has fallen in recent years (Table 5.6). Between 2001–02 and 2005–06, the average length of stay in hospital fell by about half a day for females and slightly less for males.

Chronic respiratory diseases are often aggravated by acute respiratory infections. It is not surprising, therefore, that hospitalisations for COPD are most common during the winter months, with about one-third occurring between June and August.

COPD is not managed very often in general practice: less than once every 100 encounters (Britt et al. 2007). However, in terms of both the number of hospitalisations and the average length of time spent in hospital, COPD accounts for considerable health-care resources. Each year COPD incurs health-care expenditure of several hundred million dollars in Australia, about two-thirds of which is attributed to hospital use (AIHW 2005b).

Table 5.6: Trends in hospitalisation rates and average length of stay for COPD, 2001–02 to 2005–06

	Hospitalisation rate[(a)] (per 100,000 population)		Average length of stay (days)	
Year	Males	Females	Males	Females
2001–02	344	206	7.3	7.8
2002–03	346	211	7.3	7.7
2003–04	340	211	7.2	7.7
2004–05	325	202	7.1	7.5
2005–06	313	204	7.0	7.3

(a) Age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Hospital Morbidity Database.

Asthma

Asthma is a common chronic inflammatory condition of the airways which presents as episodes of wheezing, breathlessness and chest tightness because of widespread narrowing of the airways. The symptoms are usually reversible, either spontaneously or with treatment.

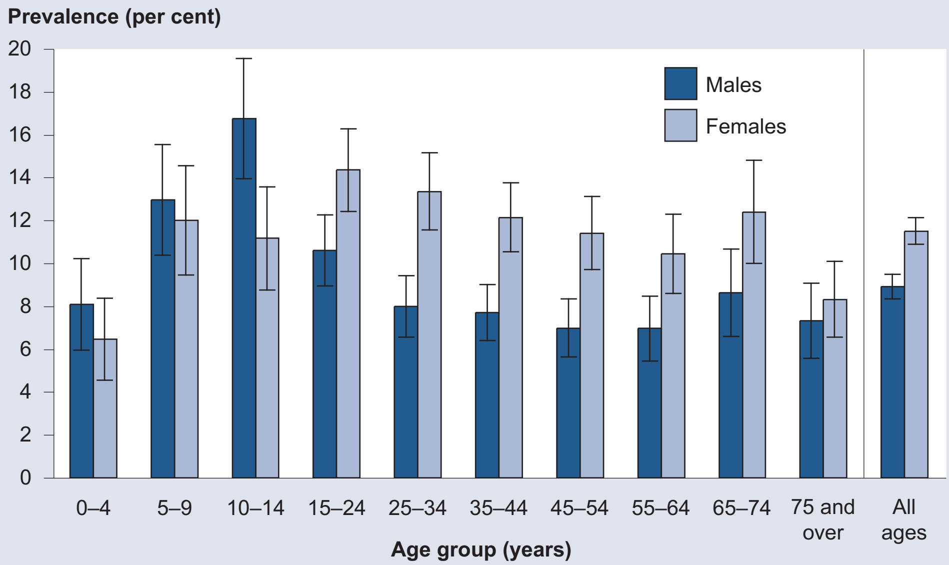
The underlying causes of asthma are still not well understood, but environmental and lifestyle factors, as well as constitutional factors such as an allergic tendency, may increase the risk of developing asthma. Among those with the condition, airway narrowing and symptoms can be triggered by a wide range of exposures and other factors. These include specific allergens, such as house dust mites, pollens, mould spores, animal danders and occupational allergens; viral infections; irritants such as tobacco smoke and other air pollutants; exercise; and some food preservatives.

Prevalence

During the 1980s and early 1990s there was a substantial worldwide increase in the prevalence of asthma. However, in recent years this trend appears to have plateaued (Asher et al. 2006; Eder et al. 2006) and may even have reversed in children. Although the prevalence of asthma in Australia remains high by international standards (ACAM 2005), national data show a recent decrease in prevalence among children and young adults in Australia, consistent with worldwide trends.

An estimated 10.3% of the Australian population had asthma in 2004–05, down from 11.6% in 2001 (ACAM 2007). The prevalence of asthma among children and adults aged under 35 years fell significantly during this period (11.7% in 2004–05 versus 14.0% in 2001). However, in the same period, there was no change in its prevalence among people aged 35 years and over.

Based on the 2004–05 NHS, among those aged under 15 years the prevalence is higher among boys than girls, but after the teenage years asthma is more prevalent in females than males (Figure 5.13). Overall, females had a significantly higher prevalence of asthma than males (11.5% compared with 8.9%).



Notes

1. Age-standardised to the Australian population as at June 2001.
2. Error bars represent 95% confidence intervals; that is, a range (interval) of values within which we can be '95% confident' that the true value lies.

Source: ABS National Health Survey 2004–05.

Figure 5.13: Prevalence of current asthma, by age group and sex, all ages, 2004–05

According to the 2004–05 National Aboriginal and Torres Strait Islander Survey and National Health Survey, the prevalence of asthma is also higher among Aboriginal and Torres Strait Islander Australians than other Australians (16.5% versus 10.2% in 2004–05, age-standardised). Although this difference exists across all age groups, it is more prominent in older adults, particularly females aged 35 years and over and males aged 55 years and over.

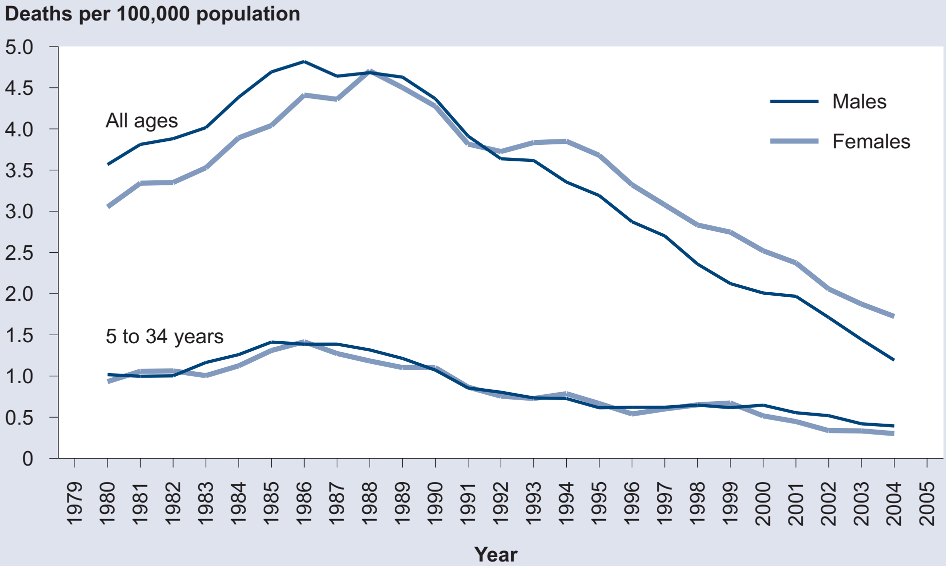
People from non-English-speaking backgrounds have a lower prevalence of asthma than those from English-speaking backgrounds, especially among those aged under 65 years. People with lower socioeconomic status have a higher prevalence of asthma than those with higher socioeconomic status. In 2004–05, the difference in the prevalence of asthma between the lowest and the highest fifth of the population based on socioeconomic status was 2.2 percentage points. This gap had widened since 2001, when the difference was 0.9 percentage points.

Mortality

Death rates due to asthma in Australia are high by international standards, although asthma is not a leading cause of mortality. Asthma was attributed as the underlying cause of 318 deaths in 2005, representing 0.24% of all deaths in that year. Although deaths caused by asthma occur in all age groups, the risk of dying from asthma increases with age.

The mortality rate attributed to asthma has been falling since the late 1980s and has fallen by more than 50% since 1989 (Figure 5.14). Until the late 1980s, the rate was higher in males but since the early 1990s it has been higher in females.

In older people, there are problems in attributing deaths to asthma because misclassification can occur between asthma and other diseases, in particular COPD. So a more reliable guide to trends may come from deaths among those aged 5–34 years, where classification is more accurate. Deaths attributed to asthma in this age group have also declined substantially since the mid to late 1980s but, in contrast to the trend observed for the population as a whole, there has been little difference in the asthma death rate between the sexes.



Notes

1. Age-standardised to the Australian population as at June 2001.
2. Asthma classified according to ICD-0 code 493 and ICD-10 codes J45 and J46.
3. Deaths coded to ICD-9 (1979–1997) were converted to ICD-10 using the following conversion: ages 0–34 years, no conversion; 35–64 years, converted by a factor of 0.84; 65+ years, converted by a factor of 0.68.

Source: AIHW National Mortality Database.

Figure 5.14: Trends in asthma mortality, 3 year moving average, 1979 to 2005 (*NHPC indicator 1.08*)

Disability and functioning

People with asthma compare poorly in a range of health-related quality-of-life measures. Across all age groups and for both sexes, they rate their general health worse than people without the disease (ACAM 2007). In addition, a higher proportion of people with asthma report taking days off work or school or having other days of reduced activity. Furthermore, they report worse psychological or ‘mental’ health. This is particularly true among females, for whom those with asthma are 2.2 times as likely to have high or very high psychological distress as others.

However, there appear to have been some recent improvements in quality of life for those with asthma. Compared with 2001, Australians with asthma in 2004–05 rated their general health as better and reported less asthma-related days off work or study (ACAM 2007).

Burden of disease

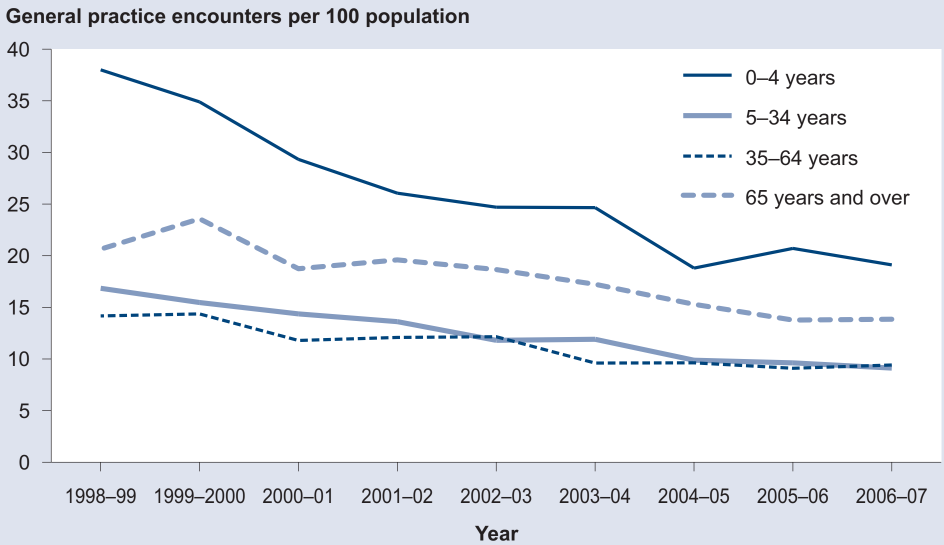
Asthma was estimated to account for 2.4% of the total disease burden in 2003, as measured by disability-adjusted life years (DALYs) (Begg et al. 2007), with the distribution of asthma burden in the population mirroring its prevalence. Among children aged under 15 years, asthma was the leading specific cause of disease burden, accounting for 17.6% of the total DALYs among boys and 17.0% among girls. Asthma was also the fourth leading cause of DALYs among 15–44 year old females.

Health service use

GP visits

General practitioners (GPs) play a central role in the management of asthma in the community. This includes assessment, prescription of regular medications, education and review, as well as managing acute episodes. Data from BEACH surveys show that the rate of GP encounters for asthma has decreased since 1998–99 (Figure 5.15). The largest reduction has been among young children aged under 5 years. Although this group had the highest rate of GP encounters for asthma compared with other ages between 1998–99 and 2006–07, the rate fell by around 50% during this time.

Among children, boys are more likely than girls to have an asthma-related GP encounter. However, after the age of 15 years this trend reverses and continues into older age groups, with more females having GP encounters for asthma than males.



Notes

1. Asthma classified according to ICPC-2 PLUS codes R96001–R96005, R96007, R96008.
2. BEACH data year is April to March.

Source: BEACH survey of general practice.

Figure 5.15: General practice encounters for asthma per 100 population, by age group, 1998–2007

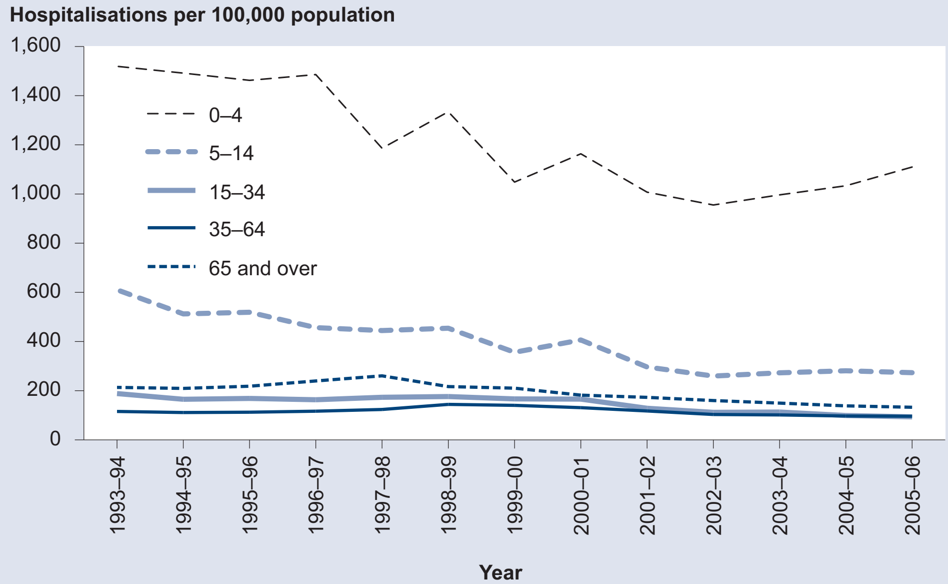
Hospitalisations

Hospitalisation for asthma is required when flare-ups or 'attacks' are life-threatening or when they cannot be managed at home. Preventing such attacks is a major goal of primary care. However, in 2004–05 there were 37,461 hospitalisations for asthma in Australia, representing 0.53% of all hospitalisations during that year.

Since 1993–94 there has been a marked reduction in the rate of hospitalisations for asthma among children aged under 15 years (Figure 5.16). Between 1993–94 and 2005–06, hospitalisations decreased by 55% among those aged 5–14 years and by 36% among those aged 15 years and over. However, children still have high rates of hospitalisation for asthma compared with adults.

Among adults, hospitalisation rates for asthma are highest in the winter months, which probably reflects the impact of the winter rise in respiratory tract infections. Among children, the peaks for hospitalisations occur in late summer and autumn. The reason for this seasonal peak is not known, though it is likely to be related to a high prevalence of respiratory viral infections, particularly the common cold, around this time. Boys aged under 15 years are more likely to be admitted to hospital for asthma than girls, but after the age of 15 years females have a higher rate than males. This pattern is consistent with prevalence rates as well as the rate of asthma-related GP consultations.

People living in remote areas (particularly older adults), Indigenous Australians and people with lower socioeconomic status have higher rates of hospitalisation for asthma than other Australians.



Notes

1. Age-standardised to the Australian population as at 30 June 2001.
2. Asthma classified according to ICD-9-CM code 493 and ICD-10-AM codes J45 and J46.
3. Hospitalisations coded to ICD-9-CM (1993 to 1997) were converted to ICD-10-AM using the following conversion: ages 0–34 years, no conversion; 35–64 years, converted by a factor of 0.64; 65 years and over, converted by a factor of 0.53.

Source: AIHW National Hospital Morbidity Database.

Figure 5.16: Trends in hospitalisations for asthma, by age, 1993–94 to 2005–06

5.6 Arthritis and other musculoskeletal conditions

Arthritis is marked by inflammation of the joints, causing pain, stiffness, deformity and disability. Other musculoskeletal conditions such as osteoporosis and back pain affect the bones, muscles and their attachments to each other. There are more than 150 forms of arthritis and musculoskeletal conditions, and their causes include overuse of joints, congenital anomalies, metabolic or biochemical abnormalities, infections, inflammatory conditions, trauma and cancer. These conditions result in few deaths but can cause significant pain and disability, severely limiting a person's ability to perform everyday tasks at home and work.

Arthritis and musculoskeletal conditions were declared a National Health Priority Area (NHPA) in 2002. The initial NHPA focus was on osteoarthritis, rheumatoid arthritis and osteoporosis, with juvenile arthritis added in 2006. The four focus areas are briefly described below.

Osteoarthritis: a degenerative joint condition that mostly affects the hands, spine and weight-bearing joints such as hips, knees and ankles. Its main feature is the breakdown of the cartilage that overlies the ends of the bones in the joint. The disease disrupts the normal function of the joint and can lead to pain, stiffness, activity limitations at home or work, and psychological distress.

Rheumatoid arthritis: a chronic auto-immune disease marked by inflammation of the joints, most often affecting the hand joints in a symmetrical fashion. The immune system attacks the tissues lining the joints, causing pain, swelling and stiffness. Over time there is progressive and irreversible joint damage, resulting in deformities and severe disability. The systemic nature of the condition can also lead to problems with the heart, lungs, nerves and eyes.

Juvenile arthritis: a common term used for arthritis occurring in children under the age of 16 years. The condition typically has an unpredictable pattern of disease activity, with periods of disease remission followed by a resurgence of signs and symptoms. The main symptoms are swelling, pain and stiffness in the affected joints. Juvenile arthritis may affect children's growth and skeletal maturity, causing long-term disability and affecting their participation in activities such as sport.

Osteoporosis: the thinning and weakening of bones that often occurs with age, increasing the risk of fracture in both males and females. Bone loss occurs when the bone remodelling process begins to favour bone breakdown. Fractures after minimal trauma, such as minor bumps or falls from a standing height, are a hallmark of osteoporosis. They can cause both acute and chronic pain and can significantly affect daily life.

Prevalence

Data from the 2004–05 National Health Survey (NHS) reveal that long-term arthritis and musculoskeletal conditions affect 31% of the population—more than 6 million Australians (Table 5.7). Arthritis affects about 3 million people, with osteoarthritis accounting for about half the cases (1.6 million). From self-reports in the NHS, rheumatoid arthritis affects about 491,000 Australians and osteoporosis affects about 586,000. However, because of the 'silent' nature of osteoporosis, its true prevalence is significantly underestimated. The highest prevalence of musculoskeletal conditions is among older people, though the conditions also affect many younger Australians. About 1 in every 36 of those aged under 18 years are estimated to have arthritis or a musculoskeletal condition—an estimated 131,000 Australian children and young people. Of these, about 4,600 children reportedly had juvenile arthritis.

Table 5.7: Prevalence and health impact of selected arthritis and musculoskeletal conditions, various years (includes *NHPC indicator 1.08*)

	Prevalence[(a)] (2004–05)		Disability[(b)] (2003)		Deaths[(c)] (2005)		Disability-adjusted life years (DALYs) (2003)	
Disease/ condition	**Number ('000)**	**Percentage of population[(d)]**	**Number ('000)**	**Percentage of population**	**Number ('000)**	**Percentage of all deaths**	**DALYs ('000)**	**Percentage of total DALYs**
Osteoarthritis	1,548	7.9	n.a.	n.a.	0.1	0.1	34.6	1.3
Rheumatoid arthritis	491	2.5	n.a.	n.a.	0.2	0.1	16.8	0.6
Juvenile arthritis	5	0.1	n.a.	n.a.	—	—	n.a.	n.a.
All arthritis	*3,020*	*15.3*	*558*	*2.8*	*0.4*	*0.3*	*n.a.*	*n.a.*
Osteoporosis	586	3.0	51	0.3	0.2	0.1	n.a.	n.a.
All arthritis and musculo-skeletal conditions	**6,092**	**31.0**	**1,245**	**6.3**	**1.0**	**0.8**	**105.5**	**4.0**

(a) Based on self-reported, current and long-term disease from the 2004–05 National Health Survey.

(b) Based on AIHW analysis of the 2003 Survey of Disability, Aging and Carers for persons aged 15 years and over.

(c) Deaths registered in 2005.

(d) For juvenile arthritis, population refers to all children aged under 16 years.

Sources: ABS 2006a; Begg et al. 2007; AIHW National Mortality Database.

Disability and functioning

Arthritis and musculoskeletal conditions are common causes of long-term disability. The nature of these limitations and disability for the main conditions is described in Box 5.7.

Based on data from the 2003 Survey of Disability, Ageing and Carers, over 6% of the Australian population have a disability related to diseases of the musculoskeletal system or connective tissue (Table 5.7). The range of disability and functional limitations differs between the various conditions, affecting not only a person's physical wellbeing but also their mental wellbeing. Arthritis and osteoporosis were the main disabling condition for about 560,000 and 51,000 Australians respectively. More than 30% of people with arthritis-associated disability and almost half with osteoporosis-associated disability are estimated to have profound or severe limitations in performing core activities such as those related to self-care and mobility (AIHW: Rahman & Bhatia 2007). Although a large proportion of people with arthritis-associated disability are aged 75 years and over (about one-quarter), just under half (266,000 persons) are of working age (15–64 years). The functional limitations imposed by the condition can cause restrictions in the types of jobs they can do, difficulty in changing jobs or in obtaining a preferred job.

Box 5.7: Disability and musculoskeletal conditions

Osteoarthritis: The type of activity a person with osteoarthritis finds difficult is greatly determined by which joints are affected. Hand and arm problems may lead to a need for help with self-care tasks involving personal hygiene, dressing or other household chores. When hip or knee function is affected, mobility can be restricted, making tasks such as going up and down stairs, rising from a chair or bed, and walking very painful and difficult.

Rheumatoid arthritis: Deterioration in physical functioning can occur rapidly in the first couple of years after diagnosis. Being unable to perform tasks can lead to high levels of anxiety and depression. A loss of positive body image due to joint deformities can also reduce a person's wellbeing. Early diagnosis and treatment can do much to reduce the impact of rheumatoid arthritis.

Juvenile arthritis: The physical symptoms of juvenile arthritis can interrupt a child's daily activities, such as attending school and participating in play or exercise. Children might find it difficult to sit on the floor, hold pens and pencils, carry books and open their lunch box. Pain and functional limitations can prevent them from participating in sport, and the physical appearance of swollen and deformed joints can affect their psychosocial function. This can in some cases lead to social isolation and poor social development, which may lead to problems with employment, social interaction and personal relationships in adulthood.

Osteoporosis: The site and severity of a fracture will determine how a person's functioning may be limited. Wrist and forearm fractures may affect the ability to write or type, prepare meals, perform personal care tasks and manage household chores. Fractures of the spine and hip usually affect mobility, making activities involving walking, bending, lifting, pulling or pushing difficult. The loss of independence from the need for assistance may also reduce wellbeing.

Burden of disease

Arthritis and musculoskeletal conditions do not account for many deaths (a total of about 1,000 each year), representing only 0.5% of life lost due to premature mortality (YLL). However, they are responsible for 7.3% of 'healthy' life lost due to poor health or disability (YLD). Including both deaths and disability, they accounted for 4% of the overall disease burden in 2003, measured in terms of DALYs (Table 5.7; Begg et al. 2007).

Health service use

The treatment and management of arthritis and other musculoskeletal conditions results in the frequent use of primary care, hospital and allied health services. These conditions are the fourth leading cause of health expenditure, accounting for $4.0 billion in 2004–05 or 7.5% of health system expenditure that can be reliably allocated to various diseases.

Most of these conditions can be effectively managed by general practitioners, who provide primary care and advice on self-management strategies. Hospital services are used when certain musculoskeletal conditions require surgical intervention or more specialised treatment. Allied health-care professionals, such as physiotherapists and occupational therapists, help to manage pain and maximise physical functioning. Information about services provided by GPs and hospitals is presented below. Unfortunately, although allied health care is an integral component of management for musculoskeletal conditions, very little information about the use of these services is currently available.

GP visits

Musculoskeletal conditions were the second most commonly managed problem by GPs in 2005–06, accounting for 11.8% of total problems managed (Britt et al. 2007). Osteoarthritis made up 1.8% of all problems managed by GPs, being managed in 27 out of every 1,000 encounters (more than one problem can be managed at each encounter). This equates to more than 2.5 million Medicare-paid GP consultations between 1 April 2005 and 31 March 2006. Rheumatoid arthritis (0.4% of problems managed in 2005–06) and osteoporosis (0.6%) are less commonly managed by GPs than osteoarthritis. This is most likely because of their lower prevalence, but it may also be related to differing levels of self-management for osteoporosis and the greater role of specialists in rheumatoid arthritis management. The most common action taken by GPs to manage osteoarthritis, rheumatoid arthritis and osteoporosis was to prescribe, advise on or supply medication.

Hospitalisations

Significant advancements in surgical treatment have provided effective options to reduce the pain and disability associated with certain musculoskeletal conditions. Joint replacement surgery (knee and hip replacement) is considered the most cost-effective intervention for severe osteoarthritis, reducing pain and disability and restoring some patients to near normal function (Bachmeier et al. 2001). The fractures resulting from osteoporosis can require hospital care and treatment. Procedures such as partial joint replacements and the use of pins, screws and plates can help to strengthen and realign broken bones. These procedures can restore some degree of function, ultimately improving quality of life.

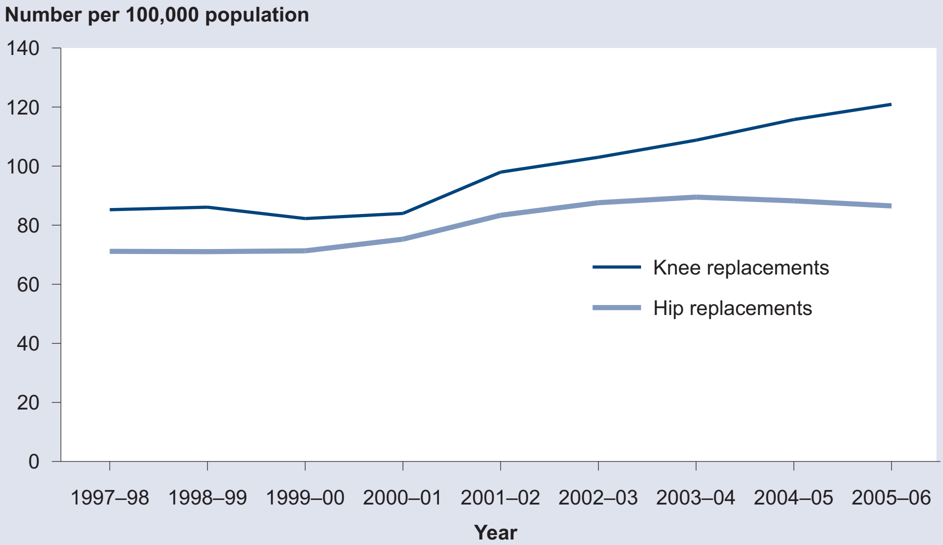
Joint replacements

In 2005–06, 44,446 total knee and hip joint replacements were performed in Australia for people with the principal diagnosis of a disease of the musculoskeletal system. About 95% of these procedures were for osteoarthritis, with the remaining 5% undertaken for osteoporosis, rheumatoid arthritis, and other musculoskeletal conditions. Knee replacements (25,897 procedures) were performed more commonly than hip replacements (18,549). Both procedures were more common in females than males.

The rate of joint replacements increased between 2000–01 and 2003–04, and this trend is expected to continue based on Australia's ageing population. However, data between 2003–04 and 2005–06 indicate that while knee replacement rates continued to rise, the rate of hip replacements declined (Figure 5.17).

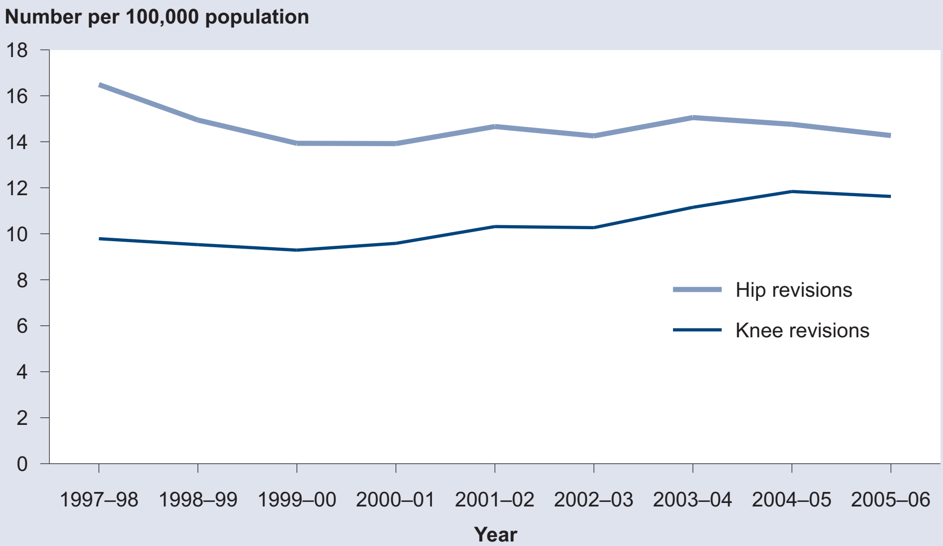
Primary hip and knee replacements may need to be revised if the artificial joint can no longer provide suitable function. The need for revision can be caused by loosening or dislocation of the artificial joint (accounts for about 63% of revisions), osteolysis (degeneration of bone), fracture or infection (Australian Orthopaedic Association National Joint Replacement Registry 2006). The quality and performance of artificial joints are major factors affecting the revision rate of total hip and knee replacements. In 2005–06, total knee revisions (11.62 per 100,000 population) were less common than total hip revisions (14.27 per 100,000) (Figure 5.18).

Hospital services account for the largest proportion of total direct health expenditure for arthritis and musculoskeletal conditions (AIHW: Penm et al. 2006). Osteoarthritis is the greatest contributor to this, reflecting the use of joint replacement in its management. The average cost of a primary hip or knee replacement in a public hospital was estimated to be $14,000–$17,000 in 2004–05, and a revision hip procedure cost $17,000–$30,000 on average (DoHA 2006).



Source: AIHW National Hospital Morbidity Database.

Figure 5.17: Trends in total primary hip and knee replacements, 1997–98 to 2005–06



Source: AIHW National Hospital Morbidity Database.

Figure 5.18: Trends in revisions of total primary hip and knee replacements, 1997–98 to 2005–06

Treatment for minimal trauma fractures

In 2005–06 there were 48,409 hospitalisations (excluding patient transfers) for minimal trauma (osteoporosis-related) fractures in persons aged 40 years and over. Almost four-fifths of these (78%) involved fractures at one of the major body sites listed in Table 5.8, with hip fractures accounting for about a third of all hospitalisations for minimal trauma fractures.

Table 5.8: Hospitalisations for minimal trauma fractures, persons aged 40 years or over, 2005–06

Fracture site[(a)]	Males	Females	Persons	Per cent
Hip	4,410	11,824	16, 234	33.5
Wrist	922	5,917	6,839	14.1
Shoulder	861	3,046	3,907	8.1
Pelvis	661	3,037	3,698	7.6
Ankle	848	2,303	3,151	6.5
Spine	861	1,756	2,617	5.4
Forearm	328	1,026	1,354	2.8
Other	3,832	6,777	10,609	21.9
Total	**12,723**	**35,686**	**48,409**	**100**

(a) Based on principal diagnosis. More than one fracture may have been recorded.

Notes

1. A hospitalisation for minimal trauma fracture was defined as any hospitalisation of a person aged 40 years and over with the principal diagnosis of a fracture and an external cause code indicating minor trauma (ICD-10-AM codes W00–W08, W18, W19, W22, W50, W51 and W548).
2. Hospitalisations where the patient was transferred from another hospital were excluded (6,891 cases, or approximately 12.5% of all minimal trauma fracture hospitalisations). This provides a more accurate estimate of the number of fractures that required hospital treatment as an admitted patient.

Source: AIHW National Hospital Morbidity Database.

5.7 Dementia

Dementia is a major health problem among older people. It can be described as a general and increasing deterioration of higher brain functions such as memory, understanding and reasoning. It is not a specific disease but a syndrome associated with a range of diseases. Dementia is highly disabling, restricts daily activities and can result in high care needs in the long term. Many diseases can cause dementia, the most common being Alzheimer's disease. Other common forms include vascular dementia, dementia with Lewy bodies, frontotemporal dementia (including Pick's disease) and mixed forms of dementia. Although dementia is not an inevitable part of ageing, its prevalence is greater in older age groups and it is very prevalent in the very old.

Disability

Even though dementia is not often fatal in itself, it causes so much disability that it was ranked fifth as a specific cause of the burden of disease among females in 2003 (Begg et al. 2007). It is the greatest single contributor to the burden of disability at older ages and the second greatest single contributor to the cost of care in residential aged care (AIHW 2007a).

In older people dementia is more likely than other health conditions to be associated with severe or profound limitations in self-care, mobility and communication, and is very likely to be associated with multiple health conditions (AIHW 2007a: Table 5.25; AIHW 2002). Other long-term problems include gait disturbance, slowed movement, fractures, arthritis, osteoporosis and urinary tract infections. The oral health of older people with dementia is also significantly worse than that of their counterparts (AIHW Dental Statistics and Research Unit 2005).

Dementia is a progressive condition whose impact on the individual's functioning increases with the growing severity of the underlying disease. It is classified as 'mild' in about 55%, 'moderate' in 30% and 'severe' in 15% of those affected, based on the severity definitions of the Clinical Dementia Rating scale (AIHW 2007a). However, the naming system of this scale does not adequately describe dementia's impact. For example, those with 'moderate' dementia are described as having such severe memory loss that only information that has long been deeply ingrained is retained. They are also severely impaired in making judgements or solving problems, they often cannot function independently outside the home, and they require help with personal care.

Because of the severity of the condition, people with dementia are heavy users of health and aged care services including GP consultations, pharmaceuticals, aged care assessments, community care programs, hospitals and residential aged care. They also require much time and help from their carers and their behavioural and psychological symptoms are also distressing to many of their carers.

Prevalence

Based on findings from major European studies, about 6.5% of Australians aged 65 years and over had dementia in 2006, including 22% of people aged 85 years and over (Table 5.9). The condition is rare in people under the age of 65 years. Almost two-thirds (64%) of older people with dementia were female, mostly because of the higher proportion of females living to older ages. Rates increase markedly with age and dementia is common in very elderly people, and almost 40% of those with dementia are aged 85 years and over. The age profile of males with dementia is different from that of females. For example, 29% of males with dementia are aged under 75 years compared with 13% of females.

Table 5.9: Prevalence of dementia by age and sex, 2006

	Rate (per cent)			Number		
Age	**Males**	**Females**	**Persons**	**Males**	**Females**	**Persons**
0–64	0.1	0.0	0.1	5,900	2,900	8,800
65–74	2.0	1.8	1.9	13,900	12,600	26,500
75–84	7.3	9.3	8.4	30,500	50,300	80,700
85+	17.1	24.9	22.4	18,300	55,300	73,500
Total 65+	*5.0*	*7.8*	*6.5*	*62,700*	*118,200*	*180,700*
Total	**0.7**	**1.2**	**0.9**	**68,600**	**121,100**	**189,500**

Note: Derived from aggregated age- and sex-specific rates from a meta-analysis of data from European studies (Lobo et al. 2000). Percentages are of the estimated Australian resident population of that age and sex at 30 June 2006.

Source: AIHW 2007a based on data from Lobo et al. 2000 and Harvey et al. 2003.

Use of cared accommodation

Because dementia is one of the most disabling health conditions, most (91%) who are moderately or severely affected require full-time care and live in cared accommodation. Conversely, nearly all (96%) with mild dementia live in households. Considering the 166,600 older people with dementia in 2003, 44% (74,100) were in cared accommodation and the remainder lived in households (Table 5.10). The proportion of people with dementia who lived in households decreased with age from 79% at ages 65–74 to 36% at ages 85 and over. Accordingly, the majority of the estimated $1.4 billion health and aged-care system expenditure for dementia in 2003 is in the residential aged-care sector, where $993 million was attributed to dementia.

Although the 2003 Survey of Disability, Ageing and Carers is currently the best source of data about dementia in cared accommodation, there is evidence that it underestimates the number of cases of mild and moderate dementia in households, and to a lesser extent in cared accommodation.

Table 5.10: Prevalence of those with dementia living in households or cared accommodation, 2003

Age	Cared accommodation[(a)]	Households	Total prevalence	Per cent living in households
0–64	1,200	6,900	8,100	85
65–74	5,300	20,100	25,400	79
75–84	27,300	49,000	76,300	64
85+	41,500	23,400	64,900	36
Total 65+	*74,100*	*92,500*	*166,600*	*56*
Total	**75,300**	**99,400**	**174,700**	**57**

(a) Cared accommodation includes Accommodation for the retired or aged, Home for the aged, Home—other, Hospital—general and Hospital—other. It is broader in scope than 'Residential aged care'.

Sources: AIHW 2007a based on data from Lobo et al. 2000 and Harvey et al. 2003 and AIHW analysis of ABS 2003 SDAC confidentialised unit record file.

The future prevalence of dementia

The number of older Australians with dementia is projected to increase from 180,700 in 2006 to 452,600 in 2031, an increase of 150% or 271,900 persons (Table 5.11). For the 6 years from 2006 to 2011, the number of older people with dementia is projected to increase by 17% (31,300 persons) to around 212,000 persons. These estimates are based on the projected increase in the number of older people over this period and assumes that prevalence rates for dementia remain stable. However, prevalence rates may change as a result of changes in prevention, detection, management and treatment of the disease.

Table 5.11: Projected number of people with dementia, 2006 to 2031

	2006			2011			2031		
Age	Male	Female	Persons	Male	Female	Persons	Male	Female	Persons
0–64	5,900	2,900	8,800	6,700	3,300	10,000	8,000	4,000	12,000
65–74	13,900	12,600	26,500	16,700	14,900	31,600	28,400	26,000	54,500
75–84	30,500	50,300	80,700	33,000	51,500	84,500	71,800	104,100	175,900
85+	18,300	55,300	73,500	25,700	70,300	96,000	74,200	148,100	222,200
Total 65+	*62,700*	*118,200*	*180,700*	*75,400*	*136,700*	*212,100*	*174,400*	*278,200*	*452,600*
Total	**68,600**	**121,100**	**189,500**	**82,100**	**140,000**	**222,100**	**182,400**	**282,200**	**464,600**

Source: AIHW 2007a, based on data from Lobo et al. 2000 and Harvey et al. 2003.

Incidence

Based on the best data about dementia prevalence, duration of illness and mortality, it has been estimated that there were 37,000 incident (new) cases of dementia among Australians in 2003, with most occurring in people over the age of 65 years (Table 5.12). The majority (63% or 23,300) of these were female and 13,900 were male. Not all incident cases of dementia will be initially visible because onset usually occurs with mild symptoms. However, as dementia is not reversible, these people will in time become part of the visible prevalent population unless they die from other causes first.

Table 5.12: Estimated incidence of dementia, by age and sex, 2003

Age	Males	Females	Persons
0–64	1,100	600	1,600
65–74	2,800	2,700	5,400
75–84	6,300	10,100	16,400
85+	3,700	9,900	13,500
Total 65+	*12,800*	*22,700*	*35,400*
Total	**13,800**	**23,200**	**37,000**

Note: Figures may not sum to totals due to rounding.

Source: AIHW and University of Queensland estimates based on meta-analysis of overseas studies (see AIHW 2007a: Box 4.3).

5.8 Mental health problems and illnesses

Mental health problems and illnesses affect the perceptions, emotions, behaviour and resulting social wellbeing of individuals. There are numerous types of mental illnesses with varying degrees of severity. Examples include anxiety, depression, bipolar disorders and schizophrenia. Mental illness is widely recognised as a major health concern in Australia. Although fewer deaths are attributed to it than to other leading health problems, it causes so much distress and disability that it was third among the broad disease groups in the burden of disease rankings for 2003 (Begg et al. 2007).

Mental illness is also associated with stigma in Australian society, which often leads to isolation and discrimination for those affected. In February 2006 the Council of Australian Governments committed to reform of Australia's mental health services nationally, with a 5-year action plan developed for Commonwealth and state/territory collaboration. The plan focuses on the removal of stigma attached to mental illness through increasing community awareness of mental illness as a disease, preventing mental ill health, intervening early, and improving access to services for those in need.

Prevalence

Based on the latest information available—collected in the 1997 National Survey of Mental Health and Wellbeing (see Box 5.8)—almost one in five Australian adults will experience a mental disorder at some time in their life. Overall, an estimated 18% of Australian adults had experienced a mental disorder in the preceding 12 months (ABS 1998).

Box 5.8 Measuring the prevalence of mental health problems

The prevalence of mental health problems used in this section comes from three main sources:

- The National Survey of Mental Health and Wellbeing was conducted by the ABS in 1997. This survey used the Composite International Diagnostic Interview to identify adults with mental illness. The survey also collected information on psychological distress using the Kessler Psychological Distress Scale-10 items (K10). K10 is a scale of non-specific psychological distress based on 10 questions about negative emotional states in the reference period (the 4 weeks before interview). Another survey was run in 2007, with results not available in time for this publication.
- The ABS National Health Survey (NHS) of 2004–05 included two measures of the prevalence of mental health problems. The first was self-reported information about long-term conditions. The second was the K10 (also collected in the previous two NHS surveys).
- The 2004 National Drug Strategy Household Survey also collected information using the K10.

The 2004–05 National Health Survey (NHS) provides the latest estimates of the prevalence of mental health problems in Australia based on self-reports (see Box 5.8). The proportion of people estimated to have a long-term mental or behavioural problem increased progressively over the last three NHS surveys—from 5.9% in 1995, to 9.6% in 2001, to 11.0% in 2004–05 (age-standardised). This may reflect a real increase, or simply a growing willingness to report mental disorders, or both. The most commonly reported problems were anxiety-related problems and mood (affective) problems, each found in about 4% of males and 6% of females. Females were more likely than males to report a long-term mental or behavioural problem (11.4% of females compared with 10% of males).

Psychological distress

Based on information in the 2004–05 NHS, an estimated 3.8% of Australians aged 18 years and over had very high levels of psychological distress (Table 5.13). Earlier estimates covering the period between 1997 and 2004 varied between 2.2% and 3.6%. In 1997 and 2001, the highest rates occurred in the 45–54 years age group, for both males and females. This remained unchanged for females in 2004–05 but for males the group with the highest rate was now those aged 55–64 years.

Table 5.14 shows that high and very high levels of psychological distress were more common in females (15%) than in males (11%) in the 2004–05 NHS, and males (67%) were more likely to have low levels of psychological distress than females (59%). Adults reporting a long-term mental or behavioural problem were much more likely to have high or very high levels of psychological distress than the total adult population (48% compared with 13%) (ABS 2006a).

Table 5.13: Prevalence of very high psychological distress[a] in adults, 1997, 2001, 2004, 2004–05 (per cent) (*NHPC indicator 1.05*)

	Age group						
Year	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65 or over**	**Total**
				Males			
1997	0.6[b]	1.3[b]	2.2	3.0	2.7	1.9[b]	1.9
2001	2.7	2.1	2.5	3.7	3.6	1.9	2.7
2004	2.5	2.9	1.5	2.0	1.9	1.0	2.0
2004–05	3.3	2.3	3.4	4.0	4.6	2.9	3.3
				Females			
1997	2.1[b]	2.8	2.4	3.8	1.5[b]	1.3[b]	2.4
2001	5.4	4.6	4.2	5.5	3.6	3.2	4.4
2004	4.5	3.2	2.9	2.0	1.7	1.4	2.6
2004–05	3.5	3.5	5.1	5.5	4.3	3.5	4.3
				Persons			
1997	1.3	2.1	2.3	3.4	2.1	1.6	2.2
2001	4.0	3.4	3.4	4.6	3.6	2.6	3.6
2004	3.5	3.0	2.2	2.0	1.8	1.2	2.3
2004–05	3.4	2.9	4.3	4.8	4.4	3.2	3.8

(a) Measured using the Kessler Psychological Distress Scale-10 items (K10).

(b) Estimate has a relative standard error of between 25% and 50% and should be used with caution.

Notes

1. Persons with scores of 30 to 50 are rated as having a very high level of psychological distress on the K10 scale of psychological distress.
2. Age-standardised to the Australian population as at 30 June 2001.

Sources: ABS 1998, 2002, 2006a; AIHW 2005d.

Table 5.14: Prevalence of psychological distress in adults, 2004–05 (per cent)

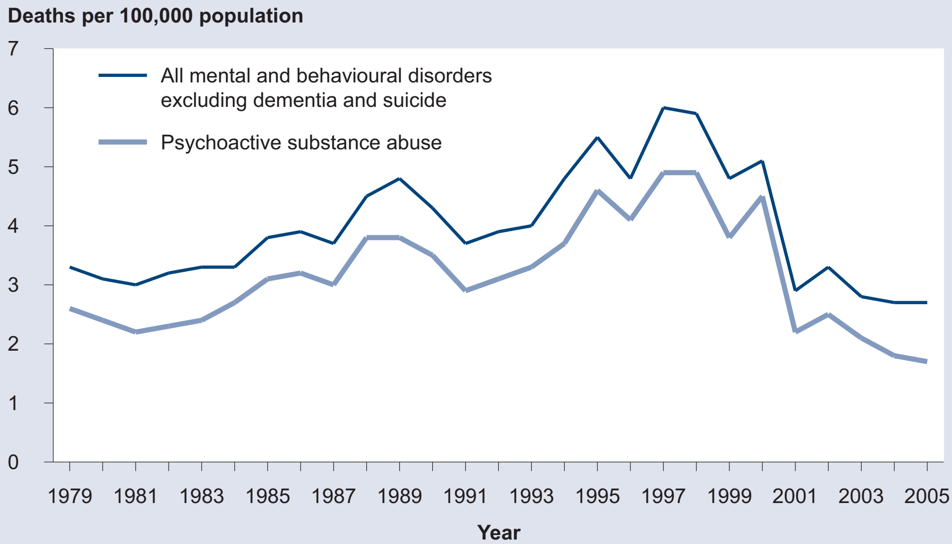
	Level of psychological distress (K10 scale[a])			
Age group	**Low**	**Moderate**	**High**	**Very high**
		Males		
18–24	60.4	27.1	9.1	3.3
25–34	64.3	26.4	7.0	2.3
35–44	64.7	23.8	7.9	3.4
45–54	67.8	21.0	7.0	4.0
55–64	70.4	18.0	6.7	4.6
65 or over	72.4	17.2	7.3	2.9
Total	**66.6**	**22.4**	**7.5**	**3.3**
		Females		
18–24	49.4	31.8	15.2	3.5
25–34	55.3	30.2	10.9	3.5
35–44	57.2	26.1	11.5	5.1
45–54	59.4	24.1	10.7	5.5
55–64	69.1	17.8	8.8	4.3
65 or over	65.4	22.8	8.1	3.5
Total	**59.1**	**25.7**	**10.8**	**4.3**

(a) Based on the Kessler 10 scale of psychological distress.

Source: ABS 2006a.

Mortality

A mental or behavioural disorder was recorded as the underlying cause for 579 deaths in 2005 (excluding dementia and suicide), an age-standardised rate of 2.7 per 100,000 persons. (Suicides are reported in Section 5.10 and dementia in Section 5.7.) The rate dropped substantially from the peak years of the mid to late 1990s, and now appears to be plateauing (Figure 5.19). Most cases with a mental or behavioural disorder as the underlying cause of death were due to abuse of psychoactive substances such as alcohol and heroin.



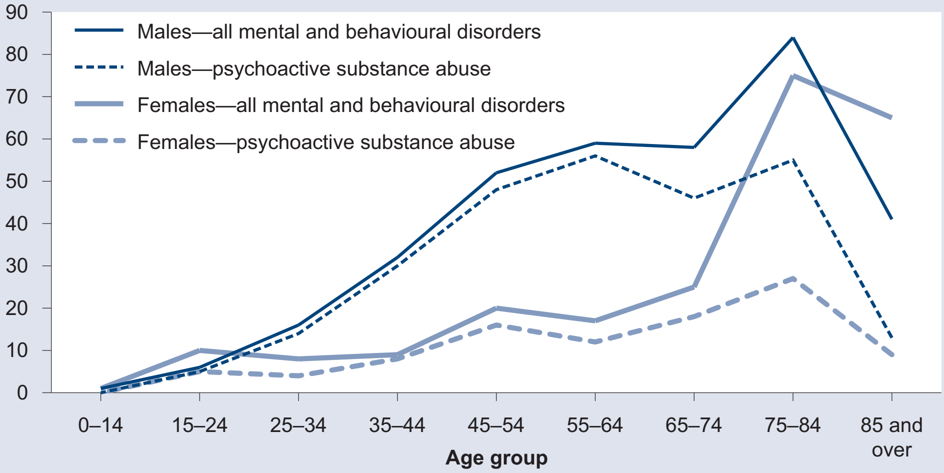
Notes

1. ICD-10 codes: all mental and behavioural disorders, F04–F99; psychoactive substance abuse, F10–F19.
2. A comparability factor was applied to enable comparison between ICD-9 (baseline) and ICD-10 (most recent) coded data.
3. Age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Mortality Database.

Figure 5.19: Death rates for mental and behavioural disorders, 1979 to 2005 (*NHPC indicator 1.08*)

Deaths due to psychoactive substance abuse were more common among males than females (Figure 5.20). Deaths with another mental or behavioural disorder as the underlying cause (that is, not psychoactive substance abuse) were mainly recorded for persons over the age of 65 years.



Note: ICD-10 codes: all mental and behavioural disorders, F04–F99; psychoactive substance abuse, F10–F19.

Source: AIHW National Mortality Database.

Figure 5.20: Deaths from mental and behavioural disorders, by sex and age group, 2005

Psychiatric disability

Based on the ABS Survey of Disability, Ageing and Carers (ABS 2005), around 1 in 20 (5.2%, about 1.0 million) Australians were estimated to have a psychiatric disabling condition in 2003. Almost half of these had severe or profound core activity limitation—that is, they sometimes or always needed help with self-care, mobility or communication (Table 5.15). The proportion of females with a psychiatric disability who had a severe or profound activity limitation was higher than for males (3.0% and 2.0% respectively).

Psychiatric disability is also associated with other disabling conditions. For those with a psychiatric problem as a disabling condition, 36.7% also had a sensory/speech disability and 36.2% reported physical and/or diverse disabilities. In those aged under 15 years, 83.9% also reported an intellectual disability.

Table 5.15: Prevalence of psychiatric disability[a] by core activity limitation, 2003

	Males		Females		Persons	
Core activity limitation	**Number ('000)**	**Per cent**	**Number ('000)**	**Per cent**	**Number ('000)**	**Per cent**
Profound core activity limitation	109.6	1.1	187.4	1.9	297.0	1.5
Severe core activity limitation	89.6	0.9	106.2	1.1	195.8	1.0
Moderate core activity limitation	65.6	0.7	91.1	0.9	156.6	0.8
Mild core activity limitation	87.9	0.9	96.9	1.0	184.8	0.9
Total with a psychiatric disability[b]	**447.4**	**4.6**	**570.5**	**5.8**	**1,017.9**	**5.2**

(a) Persons with a psychiatric disability as the main or other disabling condition.

(b) Includes persons with no core activity limitation but who are restricted in schooling or employment only, and persons without specific limitations or restrictions.

Note: Percentages are of the respective component of the Australian population.

Source: AIHW 2005c.

As at June 2005, 26.2% of the 706,782 recipients of the Australian Government's Disability Support Pension had a psychiatric/psychological condition, second only to musculoskeletal and connective tissue conditions (33.9%) (DEWR 2006).

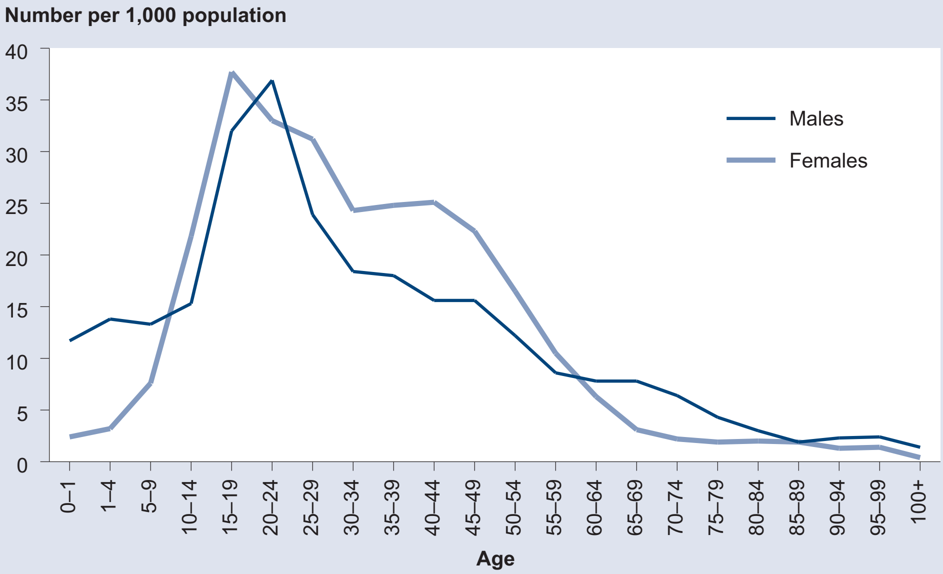
Burden of disease

Mental illness was estimated to be responsible for 13% of the total burden of disease in Australia in 2003, placing it third as a broad disease group after cancers and cardiovascular disease (Begg et al. 2007; see Section 2.6). Almost all (93%) of the mental illness burden was due to disability rather than premature mortality. In fact, mental illnesses accounted for almost one-quarter (24%) of the total disability burden for all diseases.

The burden attributed to mental illness was spread across both sexes and all ages, with females accounting for 53% of the burden. In females, anxiety and depression were the foremost causes, accounting for 10% of the overall female burden of disease, and together they ranked third (at almost 5%) in the overall male burden.

The burden from mental illnesses for both sexes was greater in early to mid adulthood than at other ages (Figure 5.21).

Mental illnesses accounted for a relatively large proportion of overall disease burden for age groups up to middle age. Twenty-three per cent of the overall burden for children aged 0–14 years was due to mental illnesses and the proportion was 36% for the 15–44 years age group.



Note: Disease burden is measured using Disability-Adjusted Life Years. See Section 2.6 for more information.

Source: Begg et al. 2007.

Figure 5.21: Mental illnesses burden by age and sex, 2003

Comorbidity

Comorbidity, involving more than one mental illness, or at least one mental illness and one or more physical illnesses, is common among those with mental illness. Based on information from the National Survey of Mental Health and Wellbeing, of people who had a mental disorder (including anxiety, affective, substance use and personality disorders), 40% reported at least one other disorder. People with multiple disorders were more disabled, more distressed, had more consultations for mental health problems, and had higher measured levels of neuroticism than those with only one disorder (Andrews et al. 2002).

From the 2004–05 NHS, the prevalence of other National Health Priority Area diseases and conditions was higher among those with a long-term mental or behavioural problem than among the total population (Table 5.16).

Table 5.16: Prevalence of NHPA diseases, 2004–05 (per cent)

NHPA disease/condition	Among persons with a long-term mental or behavioural problem	Among the total population
Arthritis	23.4	15.3
Asthma	16.0	10.2
Heart, stroke and vascular disease	6.3	3.8
Diabetes	3.7	3.6
Malignant neoplasms (cancers)	3.2	1.7

Source: ABS 2006a.

The causal link between mental illnesses and physical ill health is also now widely recognised. A recent World Health Organization report contends that there is strong evidence establishing depression as a risk factor for heart disease (Raphael et al. 2005). Australian research has also supported a causal association between depression, social isolation and lack of quality social support and the onset and prognosis of coronary heart disease (Bunker et al. 2003).

Health service use

GP visits

According to estimates from the 2005–06 BEACH survey of general practice activity, 11.1% of GP encounters involved the management of a psychological problem (Britt et al. 2007). Depression was the fourth most commonly managed problem in general practice (3.6 per 100 encounters) and the second most frequently managed chronic problem, accounting for 7.1% of total chronic problems. Over 80% of GP contacts involving a diagnosis of depression were repeat attendances. Medications relating to the nervous system were the most commonly prescribed drug type, accounting for an estimated 21.7% of prescriptions written by GPs. Medications in this group included antidepressants, anti-anxiety drugs and antipsychotics.

Hospitalisations

There were 322,110 hospitalisations with either a mental health-related principal diagnosis or a record of specialised psychiatric care in the financial year 2005–06 (1,567 hospitalisations per 100,000 people). These accounted for 2,960,201 patient days, which equates to an average stay of 9.2 days (Table 5.17).

Although constituting 4.4% of all hospitalisations, mental health-related hospitalisations accounted for 12.2% of total patient days. Principal diagnoses of depressive disorders (25.8%), neurotic and stress-related disorders (15.5%), mental and behavioural disorders due to alcohol (11.8%), and schizophrenia (9.6%) accounted for large proportions of mental health-related hospitalisations. Schizophrenia accounted for the largest proportion of such patient days (22.2%).

Table 5.17: Mental health-related hospitalisations[(a)], 2005–06 (number)

Principal diagnosis	Hospitalisations	Patient days
Dementia	5,973	143,103
Other organic mental disorders	5,166	71,717
Mental and behavioural disorders due to use of alcohol	38,122	147,964
Mental and behavioural disorders due to other psychoactive substance use	15,145	85,454
Schizophrenia	30,834	657,775
Other schizophrenic, schizotypal, delusional disorders	20,523	259,994
Manic episode	986	11,034
Bipolar affective disorder	20,854	232,111
Depressive disorders	83,189	497,523
Other mood (affective) disorders	3,527	18,881
Neurotic, stress-related and somatoform disorders	49,933	213,493
Eating disorders	4,971	56,821
Other behavioural syndromes associated with physiological disturbances and physical factors	2,123	11,115
Disorders of adult personality and behaviour	9,885	50,409
Mental retardation	409	43,834
Disorders of psychological development	887	11,586
Behavioural and emotional disorders with onset usually occurring in childhood and adolescence	4,237	13,740
Mental disorder not otherwise specified	576	6,083
Other mental health-related diagnosis[(b)]	14,636	115,825
Other[(c)]	10,134	311,739
Total	**322,110**	**2,960,201**

(a) Includes hospitalisations which reported either specialised psychiatric care days and/or a mental health-related principal diagnosis.

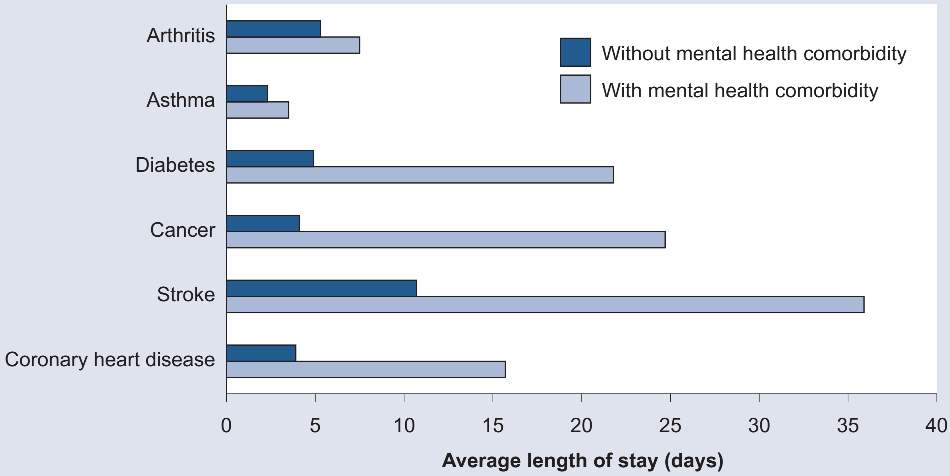
(b) Includes mental health-related diagnoses other than those in the Mental and Behavioural Disorders chapter of ICD-10-AM, as detailed in AIHW 2007b: Appendix 4.

(c) Includes hospitalisations for which specialised psychiatric care was provided without a mental health-related principal diagnosis being recorded.

Source: AIHW National Hospital Morbidity Database.

In 2005–06, there were a further 282,876 hospitalisations with a mental health-related additional diagnosis and a non-mental health-related principal diagnosis. These accounted for around 2.8 million patient days.

The average length of stay in hospital for patients with various NHPA-related principal diagnoses was higher when the patient also had a mental health diagnosis reported (Figure 5.22).



Source: AIHW National Hospital Morbidity Database.

Figure 5.22: Length of stay when mental health problems are a comorbidity in hospitalisations, 2005–06

5.9 Oral health problems

The picture for oral health problems is improving in Australia, indicated by the number of people with dental decay decreasing over the last two decades. Australia also compares well internationally, with a low number of children with decayed teeth compared with other OECD countries. However, oral health problems are still common, and since they are highly preventable there is considerable scope to improve.

The oral diseases that most frequently contribute to poor oral health in the Australian population are dental decay and periodontal (gum) disease. Both conditions can express themselves as toothache, unsightly teeth with cavities, red and sore gums, or pain with eating and drinking. Even today, it is common for a tooth to be extracted when it is affected severely by decay, gum disease, or both (see Box 5.9).

Information for this section has come from two national oral health surveys, one conducted in 2004–06, and one in 1987–88. See Box 5.10 for more information on these surveys. Information on dental services is included in Chapter 8.

Box 5.9 Dental health problems and tooth loss

Individuals who experience repeated episodes of oral disease in different teeth can lose several or all of their natural teeth. Dentures are worn by virtually all people who lose all of their natural teeth and by some people who have lost several. However, decisions to extract teeth or to wear dentures are not dictated solely by the degree of oral disease or tooth loss. Alternative treatments for severe disease or extensive tooth loss tend to be expensive, which can influence patients' and dentists' treatment preferences. There is historical evidence that when dentists had few alternative methods to treat oral disease, they were more likely to recommend extractions of all teeth, even when severe disease affected only a few such teeth (Davis 1980).

Box 5.10 National oral health surveys

New information about oral health in the Australian adult population was obtained in Australia's second National Oral Health Survey conducted in 2004–06 (Slade et al. 2007). Population estimates of oral disease and functioning were generated through interviews with 14,123 people aged 15 years or over. Additionally, dentists examined 5,505 survey participants who had one or more of their own natural teeth and recorded their levels of dental decay and gum disease.

The 2004–06 survey was Australia's second national oral examination survey, occurring 17 years after the 1987–88 National Oral Health Survey of Australia (Barnard 1993). Dental decay was measured in a way that permitted comparisons between surveys to evaluate trends.

By convention, dental decay experience is measured as the sum of three components: decayed (D), missing (M) and filled (F) teeth (T).

Prevalence

Based on the National Survey of Adult Oral Health, nearly one-fifth (19.0%) of Australians had gum disease in 2004–06 and one-quarter had untreated dental decay, with only a moderate amount of variation among age groups (Table 5.18). However, most people had a history of tooth decay, as shown by having one or more filled teeth (83.9% of people) or one or more teeth extracted because of tooth decay (61%). Both these signs of tooth decay were strongly associated with age, and were almost universal among people aged 75 years and over. Only 6.4% of Australian adults had lost all of their teeth, although this varied markedly from negligible among 15–34 year olds to over one-third of those aged 75 years and over. On average, Australians aged 15 year and over had 12.6 decayed, missing or filled teeth (DMFT).

Between 1987–88 and 2004–06, the dental health of people aged 15 years and over improved, indicated by the average number of decayed, missing or filled teeth falling from 14.9 to 12.6 (Figure 5.23). Two other distinctive trends are apparent (see Box 5.10 for information about the surveys). First, the total number of decayed, missing or filled teeth reduced markedly over the period for the three age groups below 45 years. Those younger adults were dominated by a 'fluoride generation' of people born between 1967 and 1983, who received more dental prevention than any previous generation. For example, from birth, the fluoride generation grew up in an era when virtually all toothpaste that could be purchased contained fluoride, and two-thirds of them lived in cities and towns where the water supply contained fluoride. Fluoride has been found to be effective in preventing dental decay in children, and the trends found through the surveys suggest that Australians exposed to fluoride since childhood have major oral health benefits as adults.

The second noteworthy trend, shown in Figure 5.23, is visible when considering the missing and filled components of dental decay experience among people aged 55 years and over. In each of those age groups, there were fewer missing teeth in 2004–06 compared with 1987–88, but a corresponding increase in the number of filled teeth. These findings illustrate a changing pattern of dental treatment, with a preference for fillings to treat decayed teeth, rather than extractions.

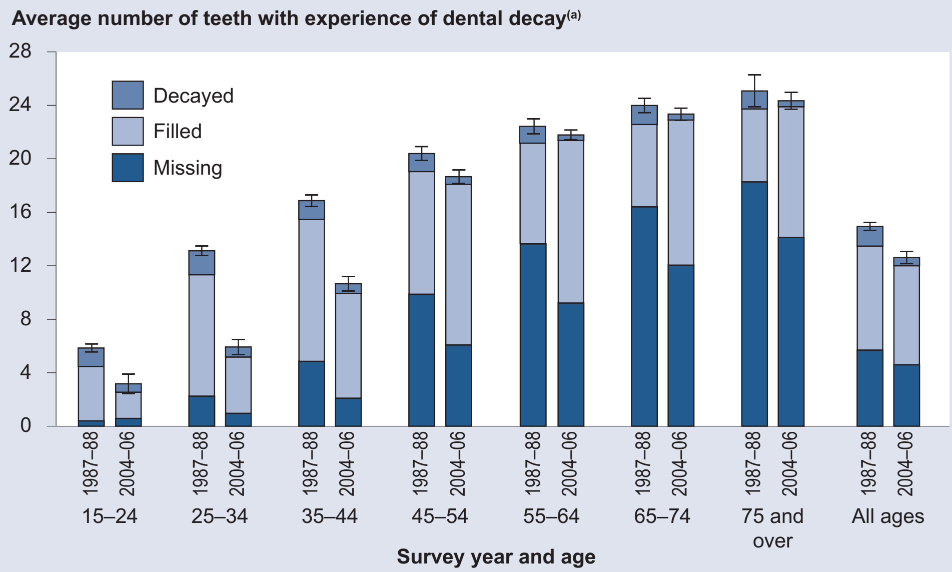
Table 5.18: Oral disease and function among adults 2004–06

Oral health indicator		All ages	15–34	35–54	55–74	≥ 75
Population: all adults						
Loss of all natural teeth	% of people	6.4	0.0	1.7	13.9	35.7
	95% CI	6.0–6.9	0.0–0.1	1.3–2.2	12.7–15.2	32.6–38.9
Avoidance of foods due to dental problems	% of people	17.4	14.7	17.7	19.8	21.1
	95% CI	16.5–18.2	13.1–16.4	16.4–19.1	18.2–21.4	18.7–23.7
Population: adults with one or more natural teeth						
Periodontal (gum) disease[(a)]	% of people	19.0	12.0	23.2	23.5	25.9
	95% CI	17.2–21.0	9.2–15.6	20.5–26.1	20.8–26.4	18.4–35.0
One or more teeth with untreated decay	% of people	25.5	25.8	27.1	22.6	22.0
	95% CI	23.7–27.3	22.4–29.5	24.6–29.8	20.1–25.4	17.4–27.4
One or more teeth filled because of decay	% of people	83.9	65.4	94.8	96.2	89.5
	95% CI	81.9–85.6	61.2–69.4	93.1–96.0	94.6–97.3	84.8–92.9
One or more teeth extracted because of decay	% of people	61.0	25.8	70.7	97.8	99.2
	95% CI	58.5–63.5	21.9–30.2	67.7–73.5	96.3–98.7	94.9–99.4
Experience of toothache during the preceding year	% of people	15.1	18.7	15.3	10.6	6.4
	95% CI	14.2–16.1	16.9–20.6	14.1–16.6	9.4–11.9	4.7–8.6
Fair or poor self-rating of oral health	% of people	16.4	13.4	18.2	18.1	18.0
	95% CI	15.5–17.4	11.9–15.1	16.8–19.7	16.4–20.0	15.1–21.3

(a) Presence of at least one periodontal pocket with both probing depth of 4 mm or more and loss of gum attachment to the tooth for 3 mm or more.

Note: 95% CI = 95% confidence interval for estimated percentage.

Source: Slade et al. 2007.



(a) Black error bars are 95% confidence interval for estimated average number of decayed, missing and filled teeth (DMFT).

Source: Slade et al. 2007.

Figure 5.23: Age group trends in dental decay experience among dentate Australians, 1987–88 to 2004–06

Disability and functioning

Based on information reported in the 2004–06 National Survey of Adult Oral Health, more than one in six (17.4%) Australians were estimated to have difficulty eating foods because of dental problems, and the percentage increased slightly with age (Table 5.18).

Among adults with at least one natural tooth, two consequences of oral disease were toothache, affecting 15.1% of Australian adults, and a perception (in 16.4% of adults) that their oral health was 'fair' or 'poor' (Table 5.18). Over the preceding years, toothache was more likely among younger adults than older adults, probably because older adults had fewer teeth. However, there was little age variation in perceived fair/poor oral health.

5.10 Injury

Injury has a major, but often preventable, impact on Australia's health. It affects Australians of all ages, is the greatest cause of death in the first half of life and leaves many with serious disability or long-term conditions. In 2003, it accounted for 7% of the burden of disease (Begg et al. 2007). For these reasons, injury prevention and control was declared a National Health Priority Area and is the subject of three national prevention plans: the National Injury Prevention and Safety Promotion Plan: 2004–2014 (NPHP 2005a), National Falls Prevention for Older People Plan: 2004 Onwards (NPHP 2005b) and the National Aboriginal and Torres Strait Islander Safety Promotion Strategy (NPHP 2005c).

This section describes fatal and serious non-fatal (hospitalised) injury in Australia.

Hospitalised injury

Hospitalisation data provide an indication of the incidence of more severe injuries (excluding those cases where the person dies before they can be admitted to hospital). Injury accounted for over 1 in 20 of all hospitalisations in Australia in the financial year 2005–06, with 400,000 admitted patient episodes that year (Table 5.19; see also AIHW 2007c). Table 5.19 also provides estimates of the number of people hospitalised (a lower number, because some injuries result in more than one episode in hospital) along with several other summary measures.

Incidence rates of serious injury are higher for males than females, both overall and for most types of injury. However, the average length of stay is longer for females than males, reflecting the large number of older females hospitalised for hip fractures (see 'Fall-related injury' later in this section).

Table 5.19: Hospitalisations due to injury and poisoning[(a)], 2005–06

Measure	Males	Females	Persons[(b)]
Hospitalisations			
Hospitalisations due to injury and poisoning[(a)]	232,666	167,347	400,019
Hospitalisations due to all causes	3,438,248	3,873,645	7,311,983
Injury hospitalisations as proportion of all hospitalisations (%)	6.8	4.3	5.5
Cases			
Estimated number of hospitalised injury cases[(c)]	216,158	155,133	371,297
Crude rate (per 100,000 population)	2,124.8	1,509.2	1,815.4
Adjusted rate (per 100,000 population)[(d)]	2,145.6	1,402.9	1,791.3
Number of patient days	728,853	769,995	1,498,862
Average patient days/case	3.4	5.0	4.0
Number of high threat-to-life cases[(e)]	31,357	29,579	60,938

(a) Includes cases where the principal diagnosis was coded to ICD-10-AM S00–T75 or T79.
(b) Includes cases where sex is missing or indeterminate.
(c) Omits inward transfers from acute hospitals.
(d) Age-standardised to the Australian population as at 30 June 2001.
(e) ICD-based Injury Severity Score < 0.941 (weights from Stephenson et al. 2003).

Source: AIHW National Hospital Morbidity Database.

High threat-to-life cases are defined here as those with injury diagnoses having about a 6% or higher chance of fatal outcome in hospital (Stephenson et al. 2003). Injury of this severity is likely to have a large impact on the patient, often with persisting problems and ongoing need for health-care services. One in 6 cases of hospitalised injury fell into this group (15% of the male cases, 19% of female) and they accounted for 43% of injury patient days in 2005–06.

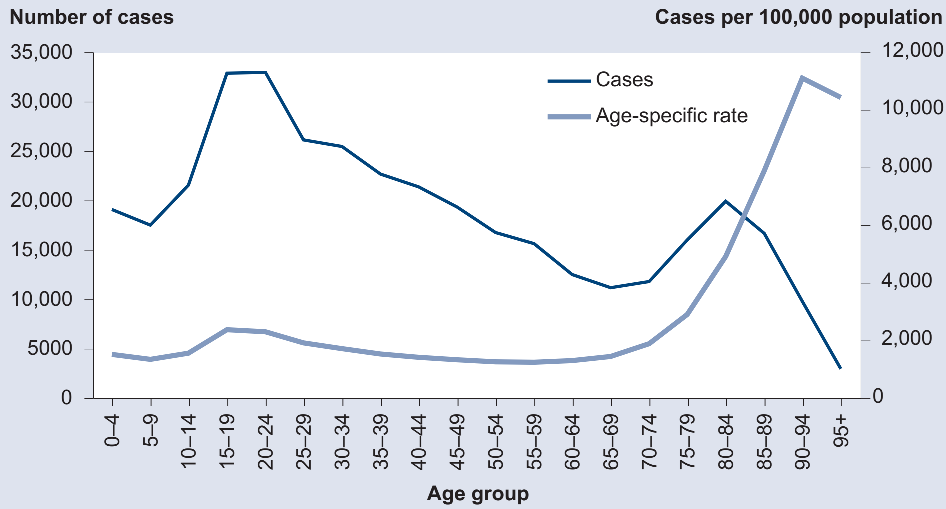
The incidence of hospitalised injury varies with age (Figure 5.24), and the number of cases is greatest among teenagers and young adults. There is also a peak in rates at this age, but by far the highest rates are in the oldest age groups.

The rate of hospitalised injury at ages 90 years and over was high in 2005–06, at more than one hospitalisation for every 10 people in that age group. This rate is almost entirely due to injury from unintentional falls (see 'Fall-related injury' later in this section).

The excess of male over female rates of hospitalised injury was largest for young adults, mainly because of transport injury (mainly road crashes) and interpersonal violence. At 60 years and over, however, the female rate exceeded the male rate, again mainly because of injury from unintentional falls.

Injuries result from exposures and events that are technically called 'external causes'. Table 5.20 summarises the types of external causes among injury cases admitted to hospital. Nearly 7 out of 8 injury cases hospitalised in 2005–06 were recorded as unintentional—that is, the injuries were not caused deliberately.

Falls and transport accidents were common external causes of injury in 2005–06 (50% of all hospitalised injury cases), and accounted for three-quarters of high threat-to-life cases (78%).



Note: Includes cases where the principal diagnosis was coded to ICD-10-AM S00–T75 or T79.

Source: AIHW National Hospital Morbidity Database.

Figure 5.24: Hospitalisations due to injury and poisoning, 2005–06: number of cases and rates, by age

Table 5.20: Hospitalisation due to injury and poisoning[(a)], by external cause groups, 2005–06

	All cases			High threat-to-life[(b)]			
External cause of injury[(c)]	**Number**	**Per cent of total**	**Rate[(d)]**	**Number**	**Per cent of total**	**Rate[(d)]**	**Per cent within type**
Unintentional							
Transportation	52,254	14	256.7	14,082	23	68.6	27
Drowning & submersion	494	0	2.5	440	1	2.2	89
Poisoning, pharmaceuticals	6,358	2	31.3	108	0	0.5	2
Poisoning, other substances	2,398	1	11.8	135	0	0.7	6
Falls	132,566	36	618.5	33,444	55	148.5	25
Fires/burns/scalds	5,457	1	27.1	1,405	2	6.9	26
Other unintentional	119,487	32	585.6	5,073	8	24.2	4
Intentional							
Self-inflicted	23,778	6	117.1	1,051	2	5.2	4
Inflicted by another person	22,080	6	109.4	4,753	8	23.5	22
Undetermined intent	4,430	1	21.8	186	0	0.9	4
Other & missing	1,995	1	9.4	261	0	1.2	13
Total	**371,297**	**100**	**1,791.3**	**60,938**	**100**	**282.5**	**16**

(a) Includes cases where the principal diagnosis was coded to ICD-10-AM S00–T75 or T79.

(b) ICD-based Injury Severity Score < 0.941 (weights from Stephenson et al. 2003).

(c) ICD-10-AM External Cause codes aggregated as in Berry & Harrison 2007.

(d) The number of cases per 100,000 persons, age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Hospital Morbidity Database.

Mortality

Almost 7.5% of all deaths occurring in Australia in 2004–05 were injury deaths, about 27 per day (Table 5.21) (see Box 5.11 for information on counting injury deaths). The overall injury death rate for males was almost 1.7 times that of females. During the first year of life, congenital and perinatal conditions were the most common cause of death, but injury was the most common cause of death from early childhood through to middle age. In 2004–05, half of all deaths of persons aged 1–44 years were due to injury.

Table 5.21: Injury deaths—numbers, proportions and rates, 2004–05

Measure	Males	Females	Persons
Number of deaths[(a)]	6,090	3,678	9,768
Proportion of all deaths (per cent)	9.0	5.8	7.5
Crude rate (per 100,000 population)	60.6	36.2	48.3
Adjusted rate (per 100,000 population)[(b)]	58.8	34.6	46.7

(a) Deaths occurring during 2004–05 for which the underlying cause of death was coded to ICD-10 V01–Y36, Y85–Y86, Y89 or any associated cause of death coded to ICD-10 S00–T75, T79. Method follows Henley et al. 2007.

(b) Age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Mortality Database.

Of the nearly 10,000 injury deaths in 2004–05, 77% (7,526 deaths) had an injury coded as the underlying cause of death, and the remaining 23% (2,242) had injury coded as an associated cause of death.

Box 5.11: Counting injury deaths

Counting injury deaths is complex, due to how injury is coded in the International Classification of Diseases, which includes 'external cause' (ICD-10 U50–Y98) and 'injury' (ICD-10 S00–T98) codes. Injury deaths reported here follow the method of counting deaths described in Henley et al. (2007). This method classifies a death as an injury death if:

- the underlying cause of death was coded to ICD-10 V01–Y36, Y85–Y86, or Y89; or
- there is an associated cause of death coded to ICD-10 S00–T75, or T79.

By counting injury deaths in this way we obtain a more accurate count than the conventional method based solely on the underlying cause of death being an external cause. The main difference between this new method and the conventional one is that complications of surgical and medical care are not included in the new definition (Henley et al. 2007). However, note that the method used here is not comparable to that used for the diseases covered in the chapter, and is different to the method used in *Australia's health 2006* to count injury deaths. The conventional method results in about 8,000 injury deaths in 2005, compared to the almost 10,000 injury deaths reported in this section.

Intentional self-harm or suicide (29%), falls (21%) and transport injury (17%) accounted for nearly 67% of injury deaths in 2004–05 (6,582 deaths). Suicide was the most frequent external cause of injury death among males, and injury due to unintentional falls was most common among females (Table 5.22).

The number of deaths for some categories in Table 5.22 are likely to be a significant underestimate (see 'Trends in mortality' later in this section).

Table 5.22: Injury deaths[(a)], by type of external cause, 2004–05 (related to *NHPC indicator 1.08*)

External cause of injury[(b)]	Males Count	Males Per cent	Males Rate[(c)]	Females Count	Females Per cent	Females Rate[(c)]	M:F (rate ratio)
Unintentional							
Transport	1,239	20.3	12.4	437	11.9	4.2	2.9
Drowning	174	2.9	1.7	62	1.7	0.6	2.7
Poisoning, pharmaceuticals	508	8.3	5.1	238	6.5	2.2	2.1
Poisoning, other substances	227	3.7	2.3	79	2.1	0.7	2.9
Falls	1,151	18.9	13.7	1,729	46.9	12.5	0.7
Fires/burns/scalds	103	1.7	1.0	53	1.4	0.5	1.9
Other unintentional	1,162	19.1	12.4	661	17.9	5.4	1.8
Subtotal	*4,308*	*70.7*	*46.0*	*3,172*	*86.0*	*25.3*	*1.4*
Intentional							
Intentional, self inflicted	1,609	26.4	16.1	420	11.4	4.1	3.9
Intentional, inflicted by another	116	1.9	1.2	57	1.5	0.6	2.0
Subtotal	*1,724*	*28.3*	*17.3*	*477*	*13.0*	*4.7*	*3.6*
Undetermined intent	68	1.1	0.7	26	0.7	0.3	2.7
Other	12	0.2	0.1	13	0.4	0.1	0.9
All external causes	**6,090**	**100**	**50.1**	**3,687**	**100**	**30.3**	**1.7**

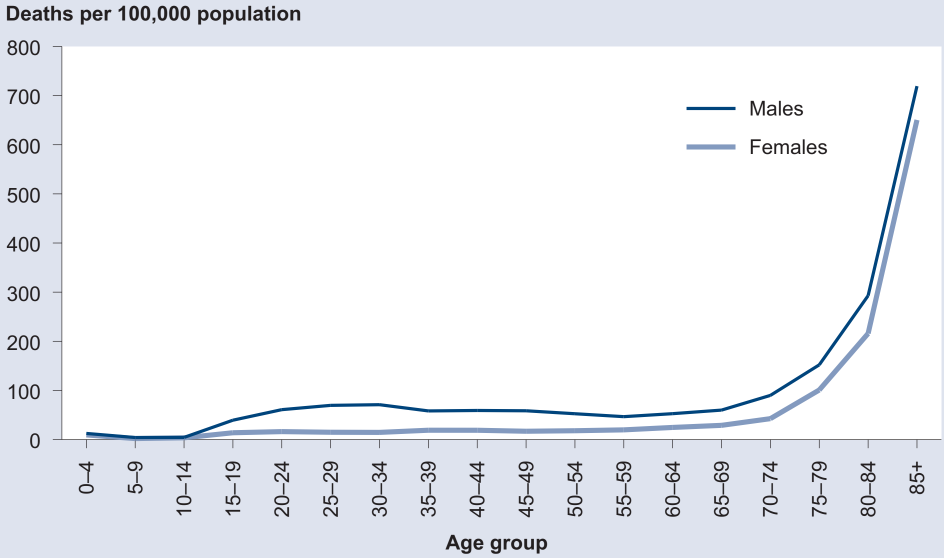
(a) Deaths occurring during 2004–05 for which the underlying cause of death was coded to ICD-10 V01–Y36, Y85–Y86, Y89 or any multiple cause of death coded to ICD-10 S00–T75, T79.

(b) Category definitions and case inclusion follow Henley et al. 2007.

(c) Number of deaths per 100,000 persons. Age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Mortality Database.

Injury death rates are relatively low in childhood (Figure 5.25). However, deaths from all causes are low in this age group, and injury accounted for about 38% of all deaths between the ages 1–14 years in 2004–05. Prominent external causes are transport injuries (especially as car occupants and pedestrians), drowning (especially for toddlers), and fires, burns and scalds. Injury is the main cause of death in the age-range during which teenagers become adults. In 2004–05, 71% of all deaths at ages 15–24 years were injury deaths, mainly due to transport injuries and suicide. Suicide and transport-related injuries are also prominent causes of injury death in middle age. At older ages, fall-related injury predominates.



Notes

1. Includes deaths occurring during 2004–05 for which the underlying cause of death was coded to ICD-10 V01–Y36, Y85–Y86, Y89 or any multiple cause of death coded to ICD-10 S00–T75, T79.
2. Age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Mortality Database.

Figure 5.25: Injury death rates by age and sex, 2004–05 (related to *NHPC indicator 1.08*)

Trends in mortality

Overall injury mortality has tended to decline during recent decades, largely due to a decline in road deaths (Kreisfeld & Harrison 2005). The decline in road deaths has slowed more recently, however. From the late 1990s, noteworthy declines occurred in drug-related deaths and in suicides (Henley et al. 2007).

Interpreting trends in injury mortality for recent years is complicated by coding issues resulting in underestimation of deaths due to certain external causes of injury (ABS 2007; Henley et al. 2007). Information available at the time of writing indicates that underestimation has occurred for road deaths, homicides and suicides. Alternative sources, available for the first two of these types, suggest that road deaths were underestimated in the mortality data by about 12% in 2005 (ATSB 2006) and homicides by about 54% in 2004–05 (Mouzos & Houliaras 2006). No suitable comparison source is available for suicide. Work is in progress to assess these issues.

Disability and chronic injury

The nature and severity of an injury will determine the likelihood and degree of long-term disability and impairment experienced by an individual. For minor injuries recovery is usually quick, typically resolving within days or weeks. More serious injuries can have major effects, resulting in a requirement for lifetime care and support. These most serious cases are sometimes described as catastrophic injuries.

Catastrophic injuries such as persisting spinal cord injury (SCI) and severe traumatic brain injury lead to long-term disability. Each year in Australia, about 300–400 new cases of SCI from traumatic and non-traumatic causes are added to an estimated prevalent SCI population of about 9,000 (AIHW: Cripps 2007). More than 13,000 cases of hospitalised traumatic brain injury (TBI) occurred each year during the 6-year period 1999–00 to 2004–05 (AIHW National Morbidity Database). TBI cases can vary in severity but it is important to note that even low threat-to-life cases of TBI can have lifelong consequences for the individual.

Other injuries such as burns, fractures, and back injuries can also have profound effects on long-term health and wellbeing. The results of the 2004–05 NHS revealed that about 2.1 million Australians had a long-term condition due to an injury (ABS 2006a). The conditions most commonly reported as being caused by an injury were musculoskeletal (25.4%)—injury was identified as the cause of 31.2% of back problems, 15.9% of rheumatism and soft tissue disorders, and 12.2% of arthritis conditions.

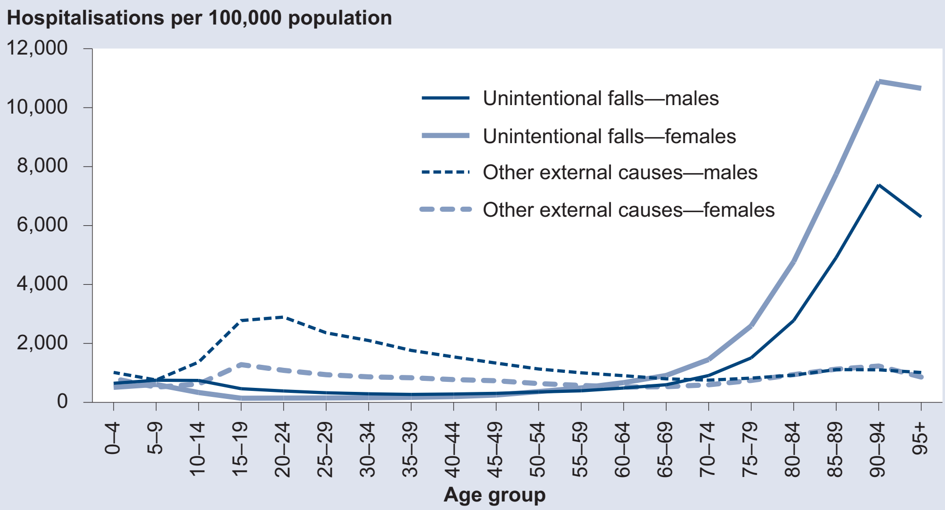
Burden of disease

Injury accounted for an estimated 7% of the total burden of disease and injury in Australia in 2003 (Begg et al. 2007), most of which was due to premature death rather than years lived with disability. About two-thirds of the injury burden was from three injury types: suicide and self-inflicted injuries, road traffic accidents and falls. Males accounted for the majority of burden for two of the three injury types, suicide and self-inflicted injuries and road traffic accidents, whereas for falls the burden was shared more equally between males and females. Early adulthood had the highest burden of injury because of high death rates mainly from road traffic accidents and suicide.

Fall-related injury

Falls account for about a third of all hospitalised injury cases and a fifth of all fatal injury in Australia. The overall age-standardised rate of injurious falls requiring hospitalisation in 2005–06 was 618.5 per 100,000 population. The rate increased exponentially with age—for Australians aged 65 years and over the rate of hospitalised fall cases in 2005–06 was about 2,350 per 100,000. At ages 85 years and over, unintentional falls accounted for about seven times the number of injury incidents attributed to all other external causes combined. Unlike for most other types of external cause, rates of hospitalisation because of falls were higher for older females than older males (Figure 5.26; see also Bradley & Harrison 2007). Deaths following injurious falls also rise rapidly with age, especially after about 70 years of age (Henley et al. 2007).

Falls by older people commonly result in a fracture, often a hip fracture. Nearly a third of hospitalised fall-related injuries for older Australians in 2005–06 involved the hip or thigh. Head injuries due to a fall were also common, particularly for males. Most injurious falls are due to slips, trips and stumbles and other falls on the same level (54% of injurious falls for people aged 65 years and over in 2005–06). Seven out of ten injurious falls resulting in hospitalisation of older people in 2005–06 occurred either in the home or in aged care facilities. Rates of injurious falls in aged care facilities have been found to be higher than those in the home (Bradley & Harrison 2007).



Note: Includes cases where principal diagnosis was coded to ICD-10-AM S00–T75 or T79 and first external cause was coded to V01–Y89.

Source: AIHW National Hospital Morbidity Database.

Figure 5.26: Hospitalisation rates for unintentional falls and for all other external causes of injury, by age and sex, 2005–06

Injurious falls by older people place a heavy burden on the hospital system because they are numerous and cases have a long average stay. These cases often require a period of rehabilitation after acute care. It is estimated that the average total hospital stay (including rehabilitation) due to an injurious fall by an older person was 15 days in 2003–04 (Bradley & Harrison 2007).

The direct cost of fall-related acute episodes of care for Australians aged 65 and over in 2003–04 was estimated to be $566 million (Bradley & Harrison 2007). The total hospital cost is likely to be considerably higher than this, because episodes of care classified as rehabilitation and certain other types could not be accounted for in this estimate.

Injury among Aboriginal and Torres Strait Islander peoples

In 2005–06, the rate of hospitalised injury for Aboriginal and Torres Strait Islander males was 2.2 times as high as the rate for other Australian males, and the corresponding rate for females was 1.8 times as high (Table 5.23). Injury mortality has been found to be about three times as high among Aboriginal and Torres Strait Islander Australians as it is in the remainder of the population (Helps & Harrison 2004). The values reported here include data only from four jurisdictions: Queensland, Western Australia, South Australia and the Northern Territory.

Accidental falls (17%) and transport injuries (9%) are prominent external causes of hospitalised injury for Indigenous people, just as they are in the overall Australian population (Table 5.23). More common than either of these external causes in the Indigenous population is hospitalisation due to injury inflicted by another person (34% of cases), which occurred at a rate 12 times that of the rest of the population.

Suicide and transport-related injuries are common causes of fatal injury, as they are in the general population. Rates of fatal injury due to interpersonal violence among Indigenous Australians are much higher than in the general population (Helps & Harrison 2004).

Table 5.23: Hospitalisation due to injury and poisoning[(a)], by external cause groups, Aboriginal and Torres Strait Islander peoples, selected jurisdictions[(b)], 2005–06

External cause of injury[(c)]	Count	Per cent of total	Rate[(d)]	Rate ratio[(e)]
Unintentional				
Transport	1,028	9	257.6	1.0
Drowning & submersion	11	0	1.6	0.6
Poisoning, pharmaceuticals	186	2	48.8	1.6
Poisoning, other substances	59	1	15.1	1.2
Falls	1,928	17	686.9	1.2
Fires/burns/scalds	303	3	81.5	2.6
Other unintentional	3,080	27	793.5	1.3
Intentional				
Self-inflicted	684	6	182.1	1.6
Inflicted by another person	3,884	34	1,084.9	12.2
Undetermined intent	154	1	44.0	2.6
Other & missing	47	0	23.2	2.0
Total	**11,364**	**100**	**3,219.1**	**1.8**

(a) Includes cases where the principal diagnosis was coded to ICD-10-AM S00–T75 or T79.

(b) Includes Queensland, Western Australia, South Australia and the Northern Territory (public hospitals only for the Northern Territory).

(c) ICD-10-AM External Cause codes aggregated as in Berry Harrison 2007.

(d) The number of cases per 100,000 persons, directly standardised to the Australian population as at 30 June 2001.

(e) Ratio of Aboriginal and Torres Strait Islander rates to rates for other Australians.

Source: AIHW National Hospital Morbidity Database.

Rates of hospitalised and fatal injury were higher at almost every age for Indigenous Australians than for the rest of the population. The risk excess (that is, the difference between the two sets of rates) was greatest at about 20–50 years of age. Hence, as with cardiovascular disease, injury is one of the causes of mortality which contribute to the low life expectancy of Indigenous Australians, mainly because of high rates at early and middle adult ages.

For injury overall, and for most specified external causes, hospitalisation and mortality rates for Aboriginal and Torres Strait Islander peoples and other Australians increase with remoteness (Helps & Harrison 2004: Helps & Harrison 2006).

5.11 Infectious diseases

The term 'infectious disease' refers to illness, fever or rash due to harmful organisms (mostly micro-organisms) or their toxic products. Generally acute in nature, infectious diseases are large causes of illness, disability and death in many parts of the world. From a public health perspective, the distinctive feature of infectious diseases is that some can occur in outbreaks that affect many people, especially if they can spread rapidly through a community through human-to-human contact.

In Australia and similar developed countries, infectious diseases are not among the leading contributors to the burden of disease. With improved sanitation, the introduction of antibiotics and immunisation programs, the impact of infectious diseases on Australia's health has reduced markedly over the last century.

Yet the burden of infectious diseases continues to be significant in Australia. Infections and immunisations account for about 7% of all GP consultations (AIHW: Britt et al. 2005). Almost 4% of deaths annually are attributed to infection (AIHW 2007d) and a similar percentage of hospitalisations in 2005–06 were for pneumonia, urinary tract infections and gastrointestinal infections (AIHW 2007c). Also, the potential for serious outbreaks continues to present a challenge in public health and requires planning and constant vigilance.

Health departments continue to monitor trends over time for certain important infections. The infections chosen for surveillance usually meet at least one of the following criteria:

- They have a high risk of death, especially if this includes young and otherwise healthy people.
- They are highly contagious.
- They have not been seen until recently; for example, severe acute respiratory syndrome (SARS), and avian influenza.
- They are not established in Australia.
- They are vaccine-preventable.
- They are related to lifestyle factors; for example sexual activity or injecting drug use.
- They arise from contaminated food.
- They can be used for bioterrorism.
- They require worldwide monitoring, even though they are not so relevant to Australia; for example, cholera.

There are four main data sources used in this section. See Box 5.12 for more information.

Box 5.12: Infectious diseases data

Four main data sources are used in this section:

- The incidence of infectious diseases is largely based on information from the National Notifiable Diseases Surveillance System (NNDSS). A disease may be made notifiable to jurisdictional health authorities depending on its significance to public health. Each state or territory has specific requirements under its public health legislation for notification by medical practitioners, laboratories and hospitals.
- Information on the number of deaths from infectious diseases has come from the AIHW National Mortality Database.
- Information on hospitalisations for infectious diseases has come from the AIHW National Hospital Morbidity Database.
- Burden of disease information comes from *The burden of disease and injury in Australia, 2003* report (Begg et al. 2007).

In this section, only deaths and hospitalisations coded to the 'certain infectious and parasitic diseases' chapter (ICD-10 and ICD-10-AM codes A00–B99) have been included. This is consistent with the method used in the burden of disease study, but differs from estimates provided in *Australia's health 2006*.

Overview

Incidence

Infectious diseases remain relatively common. Although there are no data on the incidence of infectious disease overall, some of these diseases are notifiable, meaning that the law requires them to be notified to government health authorities. A selection of the main notifiable diseases is included in Table 5.24. Among this group of diseases, chlamydia infection was the most common with over 50,000 notifications. Other leading notifiable diseases were campylobacteriosis (a gastrointestinal disease), hepatitis C and laboratory confirmed influenza.

Table 5.24: Selected notifiable diseases, 2007

Disease	Notifications	Number per 100,000
Vaccine-preventable diseases		
Meningococcal infection	310	1.5
Pneumococcal disease (invasive)	1,485	7.1
Pertussis (whooping cough)	5,396	25.7
Mumps	570	2.7
Influenza (laboratory confirmed)	10,687	50.8
Mosquito-borne diseases		
Barmah Forest virus infection	1,695	8.1
Ross River virus infection	4,152	19.8
Malaria	578	2.8
Dengue	318	1.5
Sexually transmitted infections		
HIV[(a)]	998	5.0
Syphilis[(b)]	3,057	14.5
Gonococcal infection	7,553	35.9
Chlamydial infection	51,089	243.1
Hepatitis		
Hepatitis B[(c)]	7,694	36.6
Hepatitis C[(c)]	13,436	64.0
Gastrointestinal diseases		
Campylobacteriosis[(d)]	17,663	84.0
Salmonellosis (nec)	9,694	46.1
Tuberculosis	1,116	5.3

nec = not elsewhere classified

(a) 2006.

(b) Includes all syphilis categories (see Table S22).

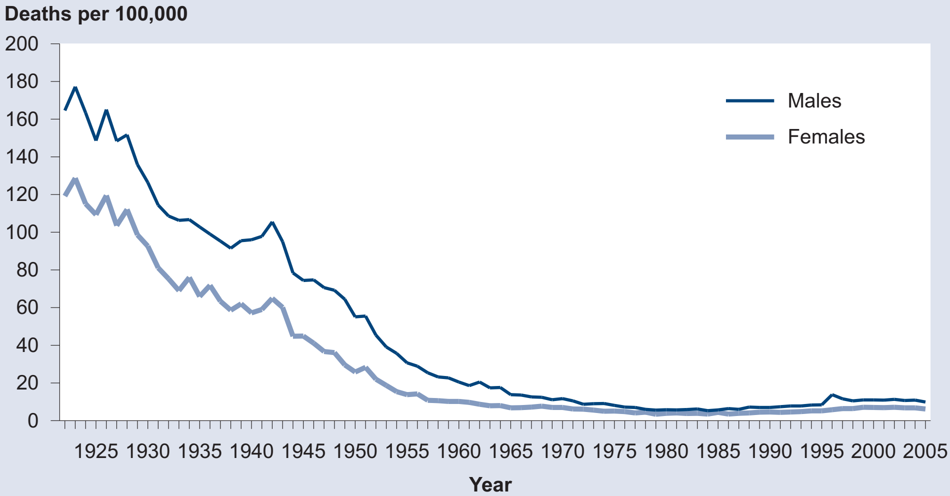
(c) Includes incident and unspecified cases.

(d) Notified as 'foodborne disease' or 'gastroenteritis in an institution' in New South Wales.

Sources: NNDSS 2007; NCHECR 2007.

Mortality

Deaths from infectious diseases have declined dramatically since the early part of the last century (Figure 5.27). In 1922, they accounted for 15% of all deaths, but by 2005 they accounted for a little over 1%. In 2005, there were just over 1,700 infectious diseases deaths, a death rate of 7.8 per 100,000 (age-standardised). Septicaemia accounted for the largest proportion of these (1,053 deaths) and the next most common was viral hepatitis (162 deaths).



Note: Includes deaths with an underlying cause of death coded to ICD-10 A00–B99 and corresponding codes in earlier versions of ICD.

Source: AIHW 2007d.

Figure 5.27: Deaths from infectious diseases, 1922–2005

Burden of disease

The infectious diseases group was a relatively small contributor to the burden of disease in 2003, accounting for 1.7% of the total burden (Begg et al. 2007). The highest infectious disease burden was for older people, particularly for those aged 75 years and over. Most of the burden (69%) was because of premature death rather than years lived with disability.

Hospitalisations

Over 87,000 hospitalisations in 2004–05 were attributed to infectious diseases (ICD-10-AM codes A00–B99 as the principal diagnosis), a figure that has remained fairly steady in recent years. Intestinal infectious diseases were the largest group (38%). The largest number of admissions were for children, particularly those aged under 5 years.

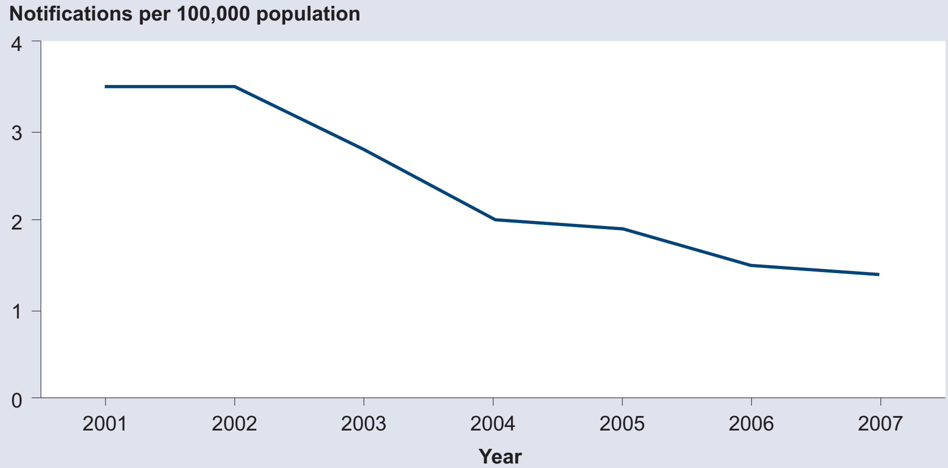
Vaccine-preventable infections

Immunisation has had a dramatic impact on rates of illness and death from a wide variety of infections. This section focuses on a select number of infections for which childhood immunisation programs exist, namely meningococcal disease, invasive pneumococcal disease, measles, pertussis, mumps and poliomyelitis.

Invasive meningococcal disease

This bacterial infection is caused by *Neisseria meningitidis* (also known as 'meningococcus'). It is one of the highest profile infections in Australia because of the rapid and serious way it can attack children and young adults. Infection is usually most common in children aged under 5 years and those aged 15–24 years (Senanayake 2007: 230). Around 10% of those infected die (Rosenstein et al. 2001), which is a high rate for an acute infection. Since 2003, there has been a nationally funded immunisation program to vaccinate against one of the five strains of the disease, namely the C strain.

Notification rates for infections due to meningococcal disease have been falling in recent years (Figure 5.28). The reasons for this are not clear but the fall is unlikely to be due solely to the introduction of the vaccine. Three main reasons point to other possible factors: the rate started to fall before the immunisation program began, rates of the B strain have also fallen, and adults older than 25 years (who are outside the target vaccination age range) were the age group with the greatest decrease, about 30% (Australian Meningococcal Surveillance Programme 2007).



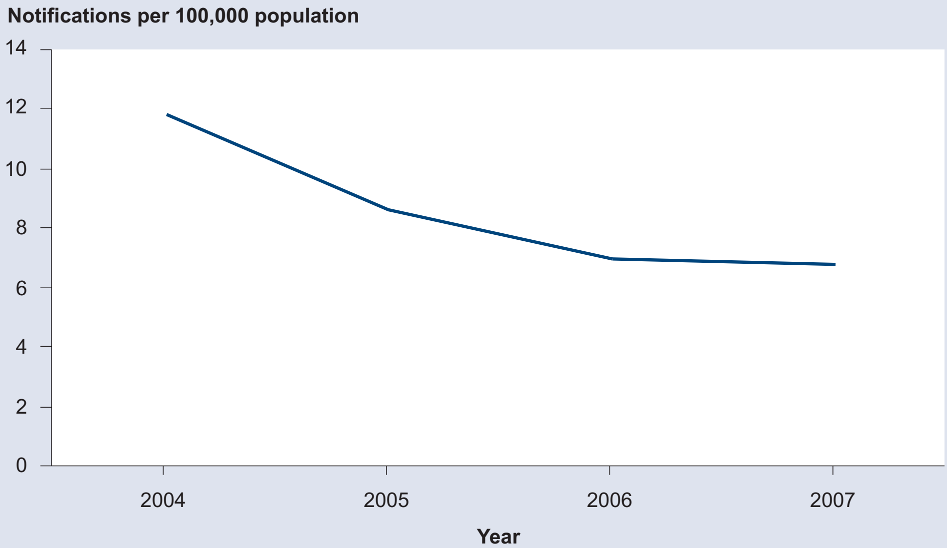
Source: NNDSS 2007.

Figure 5.28: Rates of meningococcal infections, 2001–2007

Invasive pneumococcal disease

Invasive pneumococcal disease (IPD) is due to a bacterium called *Streptococcus pneumoniae* (also known as 'pneumococcus'). An individual can be classified as having IPD only if pneumococcus is isolated from a so-called sterile site. Blood, spinal fluid and fluid from around the lung are examples of sterile sites; therefore, most middle ear and chest infections due to pneumococcus are not included in the notifications for IPD since they are not classified as sterile sites. Rates of IPD tend to be largest at the extremes of age, namely in children under 2 years and the very elderly (McIntyre et al. 2000).

Before January 2005, only certain at-risk children were eligible for free immunisation against IPD. However, from then the Australian Government expanded its program to fund vaccination for all infants and children and all adults aged 65 years and over (Roche et al. 2007a). Since these changes, there has been a reduction in notification rates of IPD (Figure 5.29), including among age groups which are not covered by the vaccination program (NNDSS 2007). This is most likely to represent a phenomenon known as 'herd immunity', where unvaccinated groups benefit from vaccination of others.



Source: NNDSS 2007.

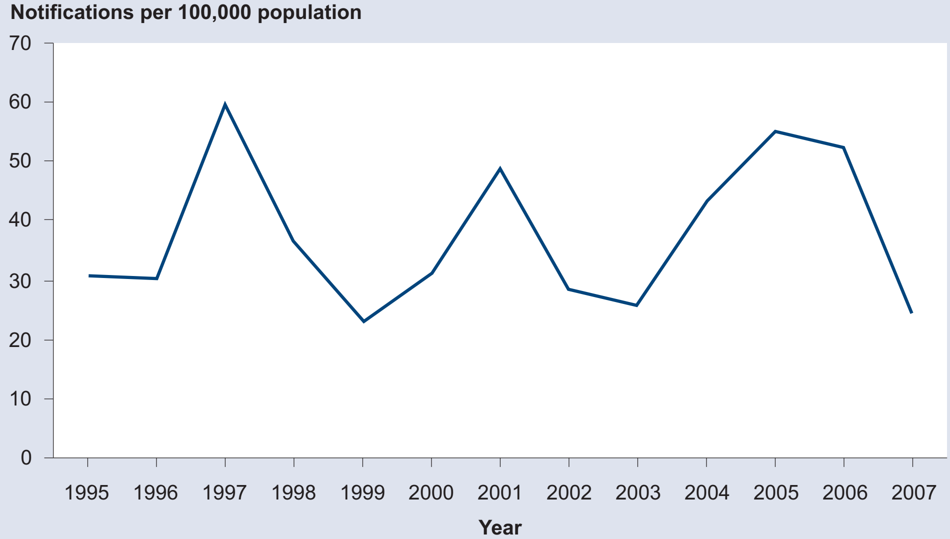
Figure 5.29: Notification rates of invasive pneumococcal disease, 2004–2007

Pertussis (whooping cough)

Pertussis is an infection usually due to the bacterium *Bordetella pertussis*. It is best known for its chronic cough and severe coughing fits that can be life-threatening, particularly in infants.

Despite global immunisation programs, pertussis remains a significant problem in both developing and developed nations (WHO 2005). This includes Australia, where pertussis is the most commonly notified vaccine-preventable infection. Since vaccination began among children in Australia, there has been a shift upwards in the age distribution of pertussis, with over 90% of notifications since 2003 occurring in those aged over 10 years and 60% in those aged 20–59 years. Although adolescents and adults tend to have a milder illness than infants, the concern is that these older individuals could go on to infect susceptible infants, the group most likely to die from the infection (Brotherton et al. 2004).

The notification rates from 1995 to 2007 show a fairly typical pattern for pertussis, namely a background rate of cases annually interrupted by an epidemic peak every 4 years or so (Figure 5.30) (NNDSS 2007; Cherry 2005).



Source: NNDSS 2007.

Figure 5.30: Notification rates of pertussis, 1995–2007

Australian surveillance data for pertussis have shown at least two positive trends which both may be attributable to the impact of changes in the immunisation schedule (NNDSS 2007; Quinn & McIntyre 2007). First, the drop in notification rates in children aged 5–9 years since 1999 probably reflects the addition of a fifth dose of vaccine in 1994–1995. Second, a reduction since 2005 may be due to introducing the 'whole of high school' vaccination program in 2004.

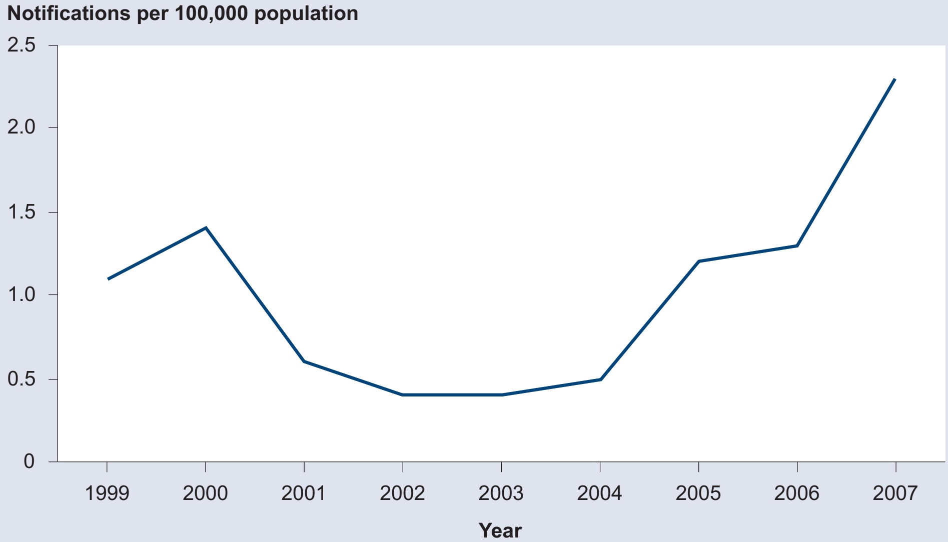
Poliomyelitis

Poliomyelitis (or 'polio') is a viral infection that can cause paralysis of limbs in previously well people, typically in children. Polioviruses are excreted in faeces and transmitted through oral ingestion of the virus. Because of global immunisation programs, transmission of naturally occurring polioviruses has been largely eradicated from most countries, including Australia. However, naturally occurring polioviruses are still being transmitted in some countries (Grassly et al. 2007), and a case occurred in Australia in early 2007 in a student who had recently travelled in Pakistan.

Mumps

Mumps is a vaccine-preventable viral disease that may be experiencing a resurgence. It causes swelling of the salivary glands in the face and can lead to a variety of complications such as meningitis, inflammation of the testicles in post-pubertal males, and pancreatitis. In susceptible populations, it is a highly infectious disease (WHO 2007a).

Notification rates of mumps have increased in Australia over the last 5 years (Figure 5.31). In addition, whereas mumps was traditionally an infection of mainly young children, it now also affects adolescents and adults (NNDSS 2007). This is probably due to a combination of vaccine failure in childhood (especially in those who received only one dose of vaccine) and waning immunity from childhood immunisation in adults (Cohen et al. 2007, Harling et al. 2005).



Source: NNDSS 2007.

Figure 5.31: Notification rates of mumps, 1999–2007

Influenza

Influenza is a common viral respiratory infection that affects many people around the world each year. The classical infection consists of fevers, generalised muscle aches, headache, cough and sore throat. This combination of symptoms is also called an 'influenza-like illness' or 'ILI', since other bacteria or viruses can produce a similar sickness. The most serious complication of influenza is pneumonia, which can be due to the influenza virus itself or a secondary bacterial infection. More details about influenza are provided in Box 5.11.

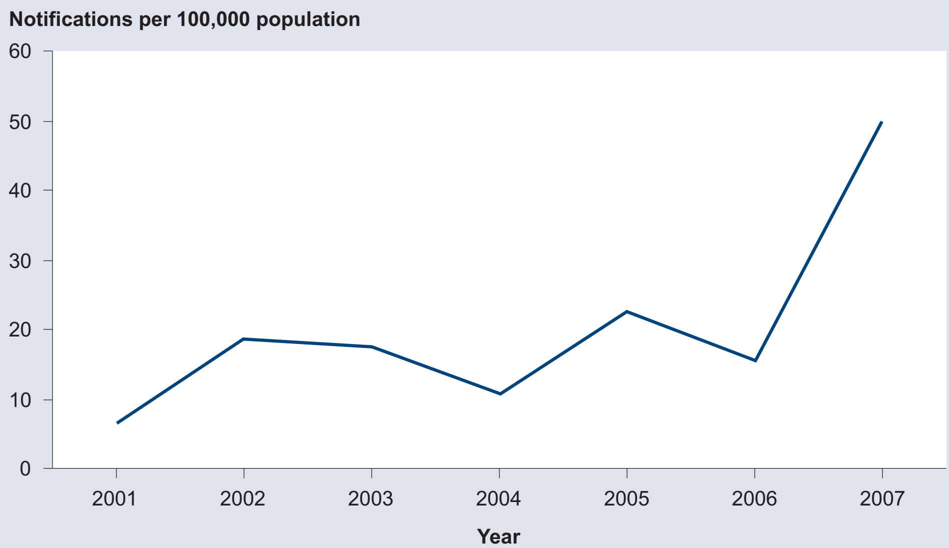
Box 5.11: Influenza characteristics and vaccination

Not all influenza viruses are the same—they are distinguished in different ways. First, they can be classed as influenza A, B or C. Influenza B and C are exclusively human viruses, whereas influenza A can also be found in aquatic birds and other mammals. Influenza A viruses can then be further subdivided into 'H' and 'N' strains based on two of their proteins (Zambon 1999). For example, avian influenza ('bird flu') is the influenza A strain H5N1.

Influenza tends to be a seasonal illness in temperate climates where it usually occurs from June to September in southern hemisphere nations (such as Australia) and December to April in the northern hemisphere. It can occur throughout the year in tropical countries (Li et al. 2005). The annual seasonal influenza epidemics are due to small changes in the virus (antigenic drift), or when a new virus subtype emerges (antigenic shift). The problem with antigenic shift is that the human population has no underlying immunity to the new virus; therefore, devastating worldwide epidemics (known as pandemics) can result. There have been three influenza pandemics since the beginning of the 20th century: 1918 (H1N1), 1957 (H2N2) and 1968 (H3N2).

Influenza vaccines need to be given just before the influenza season. Since the viruses continually mutate, a new influenza vaccine has to be given every year. The vaccine usually covers three strains of influenza: two A strains and one B strain (National Health and Medical Research Council 2003).

In 2007 Australia had a large rate of influenza notifications (Figure 5.32). In fact, 2007 marked the first year with 10,000 influenza notifications (NNDSS 2007). Although this is likely to truly represent increasing cases, other contributing factors probably include increased demand for influenza testing and the increased availability and use of more rapid and efficient testing kits.



Source: NNDSS 2007.

Figure 5.32: Notification rates of laboratory-confirmed influenza, 2001–2007

Mosquito-borne infections

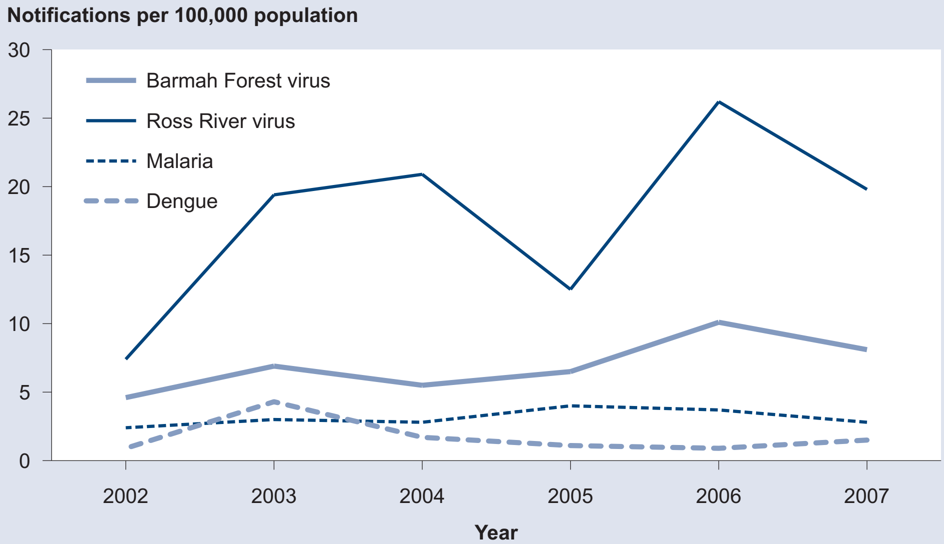
Australia has numerous notifiable mosquito-borne infections including:

- infections acquired only within Australia (such as Ross River virus and Barmah Forest virus)
- infections usually acquired only overseas (malaria)
- infections that could have been acquired in either location (such as Japanese encephalitis and dengue).

Barmah Forest virus and Ross River virus

Barmah Forest virus and Ross River virus come from a family of viruses called alphaviruses. They are transmitted to humans by a variety of species of mosquitoes. Both viruses typically cause an illness associated with fevers, rash and joint pains. Despite their geographical names, cases have now been reported throughout Australia for both infections, with most notifications being from Queensland, South Australia and New South Wales (Liu et al. 2006; NNDSS 2007).

The notification rates for both infections have fluctuated over the last few years (Figure 5.33).



Source: NNDSS 2007.

Figure 5.33: Notification rate for mosquito-borne infections, 2002–2007

Malaria

Malaria is a parasitic infection transmitted by the night-feeding Anopheles mosquito. Although hundreds of cases are reported in Australia every year, these cases have almost certainly been acquired overseas. Malaria commonly causes fevers within 2 weeks of the person being infected, although some people only become unwell many months after being bitten. Even people who take all their medication during their travel to prevent malaria can still be infected. One species of the malaria parasite can kill humans quickly if untreated, especially when it spreads to the brain ('cerebral malaria').

The 2007 data show a slight decrease in notification rates from the previous years (2.6 per 100,000 population, 545 cases) but no marked changes (Figure 5.33).

Dengue

Dengue is a viral infection found worldwide and transmitted by the day-feeding Aedes mosquito. The Aedes mosquito is found in Australia and there was a large local outbreak in 2001 in North Queensland (Hanna et al. 2002; Hills et al. 2002). There are four different types of dengue virus and infection with one type does not protect from future infections with others. If people become unwell with dengue, this usually causes an illness with fevers, rash, headache and muscle aches in the neck and back that can be very severe (Senanayake 2006). Although most people completely recover, serious complications may occur in some.

Apart from a dramatic rise in 2003, notification rates for dengue were fairly stable over the last few years (Figure 5.33). Analysis of 200 cases from 2005–2006 found that 46% of notifications were reported as imported, 43% were locally acquired and 11% had an unknown source (Liu et al. 2006).

Sexually transmitted infections

Human immunodeficiency virus

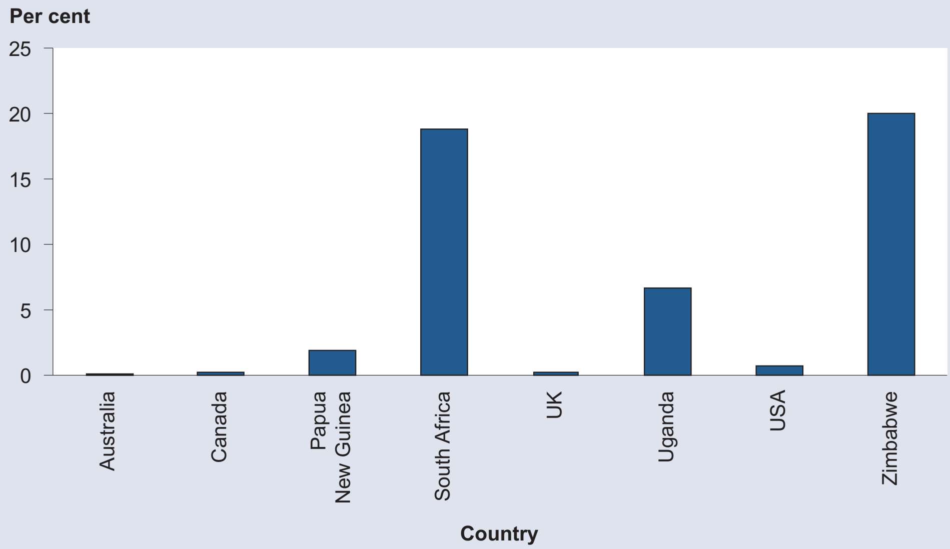
Human immunodeficiency virus (HIV) can be transmitted by sexual contact with an infected person, through infected blood products, to the fetus during pregnancy, and to infants through breastfeeding from an infected mother. Those infected can remain well for many years without treatment but are still able to infect others. In most untreated cases, the virus will damage their immune system over many years until they become susceptible to a number of serious infections and cancers. This stage is known as the acquired immune deficiency syndrome (AIDS).

Infections with HIV cannot be cured and there is no vaccine to prevent it, although research into a vaccine continues. However, a wider variety of more effective antiviral medications has allowed people with HIV to lead relatively normal lives. It has become a disease that many more people now live with rather than die from, as they previously did.

Although HIV continues to be a global problem, Australia has maintained a very low prevalence of the infection compared with other countries (Figure 5.34).

Between 1993 and 2006, more than 12,000 new HIV infections were notified in Australia. Although there was a decline in the annual number of notifications from 1993 to 1999, there was a rise from 2000 (763 in 2000 to 998 in 2006) (Guy et al. 2007). Male-to-male sex was the risk factor in 70% of these notifications, mirroring a pattern seen in other developed nations (Hamers et al. 2006; Centers for Disease Control and Prevention 2005). Only 18% of new cases were due to heterosexual contact.

Despite the rise in HIV notifications, AIDS notifications have remained relatively stable at around 230 cases each year since about 2001 (NCHECR 2007). This probably reflects the availability of more effective combinations of antiviral medications which are preventing, or at least delaying, many cases from progressing to AIDS. The reasons for the overall increase in HIV notifications are not certain but possibilities include increased testing of individuals at risk of HIV and increased levels of unsafe sexual practices (Guy et al. 2007).



Source: UNAIDS 2006.

Figure 5.34: Estimated prevalence of HIV in adults aged 15–49 years in selected countries

Syphilis

Syphilis is a complex sexually transmitted infection due to an organism known as *Treponema pallidum*. It responds well to penicillin but untreated it becomes a chronic disease with a variable course and long latent (symptom-free) periods. Its most serious expressions are tertiary (third stage) syphilis and congenital syphilis, where a child is infected by its mother during pregnancy. In a proportion of untreated cases, tertiary syphilis can arise about 10 or more years after the original infection, with serious damage to the brain, other parts of the nervous system, and the cardiovascular system. Congenital syphilis is a serious condition that can result in a variety of problems for the child from birth or even much later in life.

In Australia, there has been a resurgence of infectious syphilis, particularly in the homosexual communities. Risk factors probably include an increase in unprotected sexual practices, being HIV-positive, having more partners and using more recreational drugs (Botham et al. 2006; Jin et al. 2005). The increase of notifications is not limited to Australia and is part of a wider pattern in the developed world (Centers for Disease Control and Prevention 2004; Fenton et al. 2001).

Notifications of congenital syphilis have remained low in Australia (8–13 cases per year or 0–0.1 per 100,000 population per year from 2005 to 2007) (NNDSS 2007). This reflects effective screening and treatment of pregnant women for syphilis.

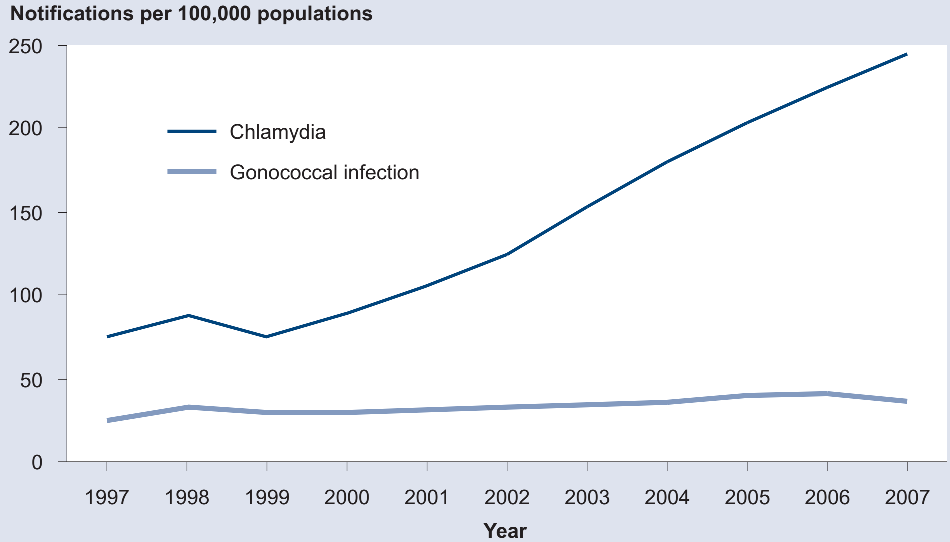
Gonococcal infection and chlamydia

Gonococcal infection is due to a bacterium called *Neisseria gonorrhoeae* (also known as 'gonococcus'). Although it can cause localised genital disease, such as gonorrhoea or pelvic inflammatory disease, gonococcus can also cause eye disease and a more widespread illness known as disseminated gonococcal infection (DGI). DGI causes an acute illness typically with fevers, rash and inflamed joints. Antibiotic resistance is a problem in treating some of these infections.

Chlamydia can cause a variety of sexually transmitted genital infections similar to gonococcal infection. A systematic review of genital chlamydia notifications in Australia from 1997 to 2004 found that young adults and especially Indigenous Australians had unacceptably high rates (Vajdic et al. 2005).

Notification rates of both gonococcal infection and chlamydia have risen since 1999. The increase has been far greater for chlamydia notifications (Figure 5.35).

There is a striking sex difference in the infection patterns: gonococcal rates are more than twice as common in males, and chlamydia is more common in females (NNDSS 2007).



Source: NNDSS 2007.

Figure 5.35: Notification rate of chlamydia and gonococcal infections, 1997–2007

Hepatitis B and C infections

Hepatitis B and C viruses can cause chronic liver damage and liver cancer. Rates of new cases of hepatitis B and C viruses have remained fairly stable in recent years at just over 1 and just over 2 per 100,000 population respectively each year (NNDSS 2007).

A program to increase vaccine coverage in the 15–19 year age group may explain a drop in rates of new hepatitis B infections between 2002 and 2006 that occurred among those aged 15–29 years. Injecting drug use accounted for about 50% of new cases of hepatitis B infection with another 21% attributed to heterosexual sex (NCHECR 2007).

Between 2002 and 2006, there was a large decline in the diagnosis of hepatitis C infections in those aged 15–39 years. This is thought to be due largely to less injecting drug use, which is considered one of the most important causes of hepatitis C transmission (NCHECR 2007).

Gastrointestinal outbreaks

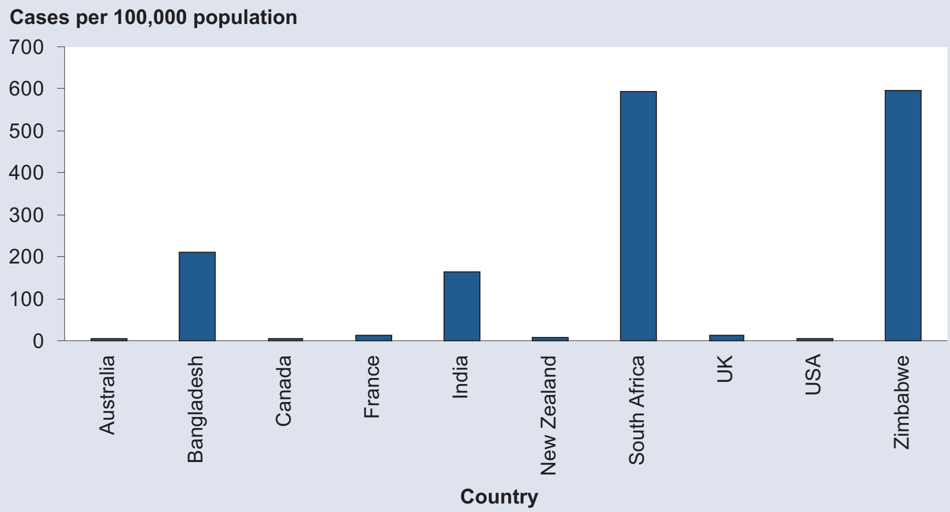
Gastrointestinal infections are common, with only limited data available to monitor them. Some data are available from OzFoodNet, a federal government agency that specialises in investigating outbreaks of gastrointestinal illness and clusters of disease due to contaminated food (OzFoodNet Working Group 2006a, 2006b, 2006c, 2007a, 2007b, 2007c). These reports under-represent the true number of outbreaks since many are not reported to health authorities (OzFoodNet Working Group 2007a).

There were 2,143 outbreaks of gastrointestinal illness notified to OzFoodNet during the 18-month period from 1 January 2006 to June 2007, an average of 27 per week around the country. Most of the outbreaks were attributed to person-to-person spread. The number of people affected in a quarter ranged from 4,522 to 14,688. The number hospitalised from these outbreaks ranged from 72 to 306 per quarter, with a death rate ranging from 0.06% to 0.30%.

The organism causing these outbreaks was often not identified but when it was, salmonella was the most common cause. Salmonella is a bacterium found in a variety of animals, including humans, and it can contaminate virtually any food.

Tuberculosis

Tuberculosis (TB) is a potentially serious infection caused by a group of bacteria known as the TB complex, with most cases caused by *Mycobacterium tuberculosis*. It especially affects the lungs, with fever-like symptoms and destruction of tissue. New TB cases still occur in Australia, with about 1,000 new cases identified annually, representing an incidence of around 5 per 100,000 population (NNDSS 2007). This is low compared with other developed and developing nations (Figure 5.36). Despite this, the rate is disproportionately high in certain groups, namely Indigenous Australians and people born overseas (Roche et al. 2007b). Also, rates of TB in people born overseas have been rising since 1991 while they have been falling in Australian-born individuals (Roche et al. 2007b).



Sources: Estimated from WHO 2007b and Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat 2006.

Figure 5.36: Incidence of tuberculosis in selected countries, 2005

People with HIV are prone to TB and this has become a problem overseas. The death rate for TB in HIV-positive individuals is much higher than in non-HIV individuals (Corbett et al. 2003). A US study found that 26% of their TB cases in 2007 were associated with HIV. In Australia though, out of 373 individuals with TB who were tested for HIV, only 9 (2%) were positive (Roche et al. 2007b).

Although TB can affect virtually any part of the body, TB of the lungs is still the most common form in Australia, occurring in over 55% of cases in 2005 (Roche et al. 2007b). TB of the lungs is especially important because, unlike other forms of TB, it can be spread to other individuals.

Emerging infections

Avian influenza

Avian influenza ('bird flu') currently remains rare worldwide. In 2007, there were 77 human cases of bird flu worldwide, two-thirds of whom died. This takes the total number of cases between the end of 2003 to the end of 2007 to 340, with 61% dying. There have been no human cases in Australia since the outbreak began (WHO 2007c).

Chikungunya

This is a viral infection transmitted by mosquitoes that typically causes severe joint pains, rash and conjunctivitis. Recently, there have been large epidemics of chikungunya in Asia and Africa involving hundreds of thousands of individuals (Charrel et al. 2007). Two of the major mosquito vectors involved in its transmission are both found in Australia; therefore, if people with chikungunya enter Australia from overseas, this could lead to local epidemics within Australia.

References

ABS (Australian Bureau of Statistics) 1998. Mental health and wellbeing: profile of adults, Australia, 1997. ABS Cat. no. 4326.0. Canberra: ABS.

ABS 2002. 2001 National Health Survey: summary of results. ABS Cat. no. 4364.0. Canberra: ABS.

ABS 2005. Disability, ageing and carers, Australia, basic confidentialised unit record file (reissue), 2003. ABS Cat. no. 4430.0. Canberra: ABS.

ABS 2006a. 2004–2005 National Health Survey: summary of results, Australia. Cat. no. 4364.0. Canberra: ABS.

ABS 2006b. National Aboriginal and Torres Strait Islander Health Survey, Australia 2004–05. ABS Cat. no. 4715.0 Canberra: ABS.

ABS 2007. Causes of death, Australia 2005. ABS Cat. no. 3303.0. Canberra: ABS.

ABS & AIHW (Australian Institute of Health and Welfare) 2005. The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples. ABS Cat. no. 4704.0. Canberra: ABS.

ACAM (Australian Centre for Asthma Monitoring) 2005. Asthma in Australia 2005. AIHW Asthma Series 2. Cat. no. ACM 6. Available at Canberra: AIHW.

ACAM 2007. Asthma in Australia: findings from the 2004–05 National Health Survey. Cat. no. ACM 10. Canberra: AIHW.

ADIPS (Australasian Diabetes in Pregnancy Society) 2007. Gestational diabetes. Viewed September 2007, <http://adips.org>.

AIHW (Australian Institute of Health and Welfare) 2002. Older Australia at a glance 2002, 3rd edition. ABS cat. no. 8932.0. AIHW cat. no. AGE 25. Canberra: AIHW.

AIHW 2004. Heart, stroke and vascular diseases—Australian facts 2004. Cat. no. CVD 27. Canberra: AIHW and National Heart Foundation of Australia.

AIHW 2005a. Chronic kidney disease in Australia, 2005. Cat. no. PHE 68. Canberra: AIHW.

AIHW 2005b. Chronic respiratory diseases in Australia: their prevalence, consequences and prevention. Cat. no. PHE 63. Canberra: AIHW.

AIHW 2005c. Mental health services in Australia 2003–04. Cat. no. HSE 40. Canberra: AIHW

AIHW 2005d. 2004 National Drug Strategy Household Survey: first results. Cat. no. PHE 57. Canberra: AIHW (Drug Statistics Series no. 13).

AIHW 2007a. Dementia in Australia: national data analysis and development. Cat. no. AGE 53. Canberra: AIHW.

AIHW 2007b. Mental health services in Australia 2004–05. Cat. no. HSE 47. Canberra: AIHW.

AIHW 2007c. Australian hospital statistics 2005–06. Cat. no. HSE 50. Canberra: AIHW Health Services Series no. 30.

AIHW 2007d. GRIM (general record of incidence of mortality) books. Canberra: AIHW.

AIHW 2008. Diabetes: Australian facts 2008. Cat. no. CVD 40 (Diabetes Series No.8). Canberra: AIHW.

AIHW: Catanzariti L, Faulks K & Water A-M 2007. National Diabetes Register. statistical profile 1999–2005. Cat. no. CVD 39. Diabetes Series no. 7. Canberra: AIHW.

AIHW: Cripps RA 2007. Spinal cord injury, Australia 2005–06. Cat. no. INJCAT 102. Adelaide: AIHW.

AIHW: Field B 2003. Heart failure: what of the future? Bulletin no. 6. Cat. no. AUS 34. Canberra: AIHW.

AIHW: Field B. 2004. Rheumatic heart disease: all but forgotten in Australia except among Aboriginal and Torres Strait Islander peoples. Bulletin no. 16. Cat. no. AUS 48. Canberra: AIHW.

AIHW: Mathur S 2002. Epidemic of coronary heart disease and its treatment in Australia. Cat. no. CVD 21. Cardiovascular disease series no. 20. Canberra: AIHW.

AIHW: Mathur S, Moon L & Leigh S 2006. Aboriginal and Torres Strait Islander people with coronary heart disease: further perspectives on health status and treatment. Cardiovascular disease series no. 26. Cat. no. CVD 34. Canberra: AIHW.

AIHW: Penm E 2008 (forthcoming). Cardiovascular disease and its associated risk factors in Aboriginal and Torres Strait Islander peoples. Canberra: AIHW.

AIHW: Penm E, Dixon T & Bhatia K 2006. Health expenditure for arthritis and musculoskeletal conditions in Australia, 2000–01. AIHW Bulletin no. 46. Cat. no. AUS 83. Canberra: AIHW.

AIHW: Rahman N & Bhatia K 2007. Impairments and disability associated with arthritis and osteoporosis. Cat no. PHE 90. Canberra: AIHW.

AIHW: Senes S 2006. How we manage stroke in Australia. Cat. no. CVD 31. Canberra: AIHW.

AIHW: Senes S & Penm E 2007. Medicines for cardiovascular health: are they used appropriately? Cat. no. CVD 36. Canberra: AIHW.

AIHW: Tong B & Stevenson C 2007. Comorbidity of cardiovascular disease, diabetes and chronic kidney disease in Australia. Cardiovascular Disease Series no. 28. Cat. no. CVD 37. Canberra: AIHW.

AIHW Dental Statistics and Research Unit 2005. The oral health of older adults with dementia. Dental statistics and research series no. 29. Cat. no. DEN 111. Canberra: AIHW.

Andrews G, Slade T & Issakidis C 2002. Deconstructing current comorbidity: data from the Australian National Survey of Mental Health and Well-Being. British Journal of Psychiatry 181:306–14.

Asher MI, Montefort S, Bjorksten B, Lai CKW, Strachan DP, Weiland SK et al. 2006. Worldwide trends in the prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and eczema in childhood: ISAAC Phases One and Three repeat multicountry cross-sectional surveys. Lancet 368:733–43.

Atkinson MA & Eisenbarth GS 2001. Type 1 diabetes: new perspectives on disease pathogenesis and treatment. Lancet 358:221–9.

ATSB (Australian Transport Safety Bureau) 2006. Road deaths Australia: 2005 statistical summary. Canberra: ATSB.

Australasian Creatinine Consensus Working Group 2005. Chronic kidney disease and automatic reporting of estimated glomerular filtration rate: a position statement. Medical Journal of Australia 183(3):138–41.

Australian Meningococcal Surveillance Programme 2007. Annual report of the Australian Meningococcal Surveillance Programme, 2006. Communicable Diseases Intelligence 31(2):185–94.

Australian Orthopaedic Association National Joint Replacement Registry 2006. Annual Report. Adelaide: AOA.

Bachmeier CJ, March LM, Cross MJ, Lapsley HM, Tribe KL, Courtenay BG et al. 2001. A comparison of outcomes in osteoarthritis patients undergoing total hip and knee replacement surgery. Osteoarthritis Cartilage 9:137–46.

Barnard PD 1993. National Oral Health Survey Australia 1987–88. Canberra: Australian Government Publishing Service.

Begg S, Vos T, Barker B, Stevenson C, Stanley L, Lopez AD, 2007. The burden of disease and injury in Australia 2003. AIHW Cat. no. PHE 82. Canberra: AIHW.

Berry JG & Harrison JE 2007. Hospital separations due to injury and poisoning, Australia 2003–04. Injury Research and Statistics Series no. 30. AIHW Cat. no. INJCAT 88. Adelaide: AIHW.

Botham SJ, Ressler KA, Bourne C et al. 2006. Epidemic infectious syphilis in inner Sydney—strengthening enhanced surveillance. Australian and New Zealand Journal of Public Health 30:529–33.

Bradley C & Harrison JE 2007. Hospitalisations due to falls in older people, Australia, 2003–04. Injury research and statistics series no. 32. AIHW Cat. no. INJCAT 96. Adelaide: AIHW.

Britt H, Miller GC, Charles J, Pan Y, Valenti L, Henderson J, Bayram C, O'Halloran J, Knox S 2007. General practice activity in Australia 2005–06. General practice series no. 19. AIHW Cat. no. GEP 19. Canberra: Australian Institute of Health and Welfare.

Britt H, Miller GC, Knox S et al. 2005. General practice activity in Australia 2004–05. AIHW Cat. no. GEP 18. Canberra: AIHW.

Brotherton J, McIntyre P, Puech M et al. 2004. Vaccine preventable diseases and vaccination coverage in Australia 2001 to 2002. Communicable Diseases Intelligence 28:vii–S116.

Bunker SJ, Colquhoun DM, Murray DE, Hickie IB, Hunt D, Jelinek VM et al. 2003. 'Stress' and coronary heart disease: psychosocial risk factors. National Heart Foundation position statement update. Medical Journal of Australia 178(6):272–276.

Centers for Disease Control and Prevention 2004. Trends in primary and secondary syphilis and HIV infections in men who have sex with men—San Francisco and Los Angeles, California, 1998–2002. MMWR Morbidity and Mortality Weekly Report 53:575–8.

Centers for Diseases Control and Prevention 2005. Trends in HIV/AIDS diagnoses—33 states, 2001–2004. MMWR Morbidity and Mortality Weekly Report 54:1149–53.

Chadban SJ, Briganti EM, Kerr PG et al. 2003. Prevalence of kidney damage in Australian adults: the AusDiab kidney study. Journal of the American Society of Nephrology 14:S131–8.

Chapman KR, Mannino DM, Soriano JB et al. 2006. Epidemiology and costs of chronic obstructive pulmonary disease. European Respiratory Journal 27:188–207.

Charrel RN, de Lamballerie X & Raoult D 2007. Chikungunya—the globalization of vectorborne diseases. New England Journal of Medicine 356:769–71.

Cherry JD 2005. The epidemiology of pertussis: a comparison of the epidemiology of the disease pertussis with the epidemiology of Bordetella pertussis infection. Pediatrics 115:1422–7.

Chew GT, Gan SK & Watts GF 2006. Revisiting the metabolic syndrome. Medical Journal of Australia 185:445–9.

Cohen C, White JM, Savage EJ et al. 2007. Vaccine effectiveness estimates, 2004–2005 mumps outbreak, England. Emerging Infectious Diseases 13:12–17.

Colagiuri S, Borch-Johnson K, Glumer C & Vistisen G 2005. There really is an epidemic of Type 2 diabetes. Diabetologia 48(8):1459–63.

Corbett EL, Watt CJ, Walker N et al. 2003. The growing burden of tuberculosis: global trends and interactions with the HIV epidemic. Archives of Internal Medicine 163:1009–21.

Davis P 1980. The social context of dentistry. London: Croom Helm, 64.

de Marco R, Accordini S, Cerveri I et al. 2004. An international survey of chronic obstructive pulmonary disease in young adults according to GOLD stages. Thorax 59:120–5.

DEWR (Department of Employment and Workplace Relations) 2006. Characteristics of Disability Support Pension recipients June 2005. Canberra: DEWR.

DIAMOND Project Group 2006. Incidence and trends of childhood Type 1 diabetes worldwide 1990–1999. Diabetic Medicine 23:857–66.

Dickman P 2004. Estimating and modelling relative survival using SAS. Stockholm: Karolinska Institutet. Downloaded 8 May 2007, <www.pauldickman.com>.

DoHA 2006. Cost report round 9 (2004–05) AR-DRG 5.0. Canberra: DoHA. Viewed 24 January 2007, <www.health.gov.au>.

Dunstan D, Zimmet P, Welborn T et al. 2002. The rising prevalence of diabetes and impaired glucose tolerance. The Australian Diabetes, Obesity and Lifestyle Study. Diabetes Care 25:829–34.

Eder W, Ege MJ & Von Mutius E 2006. The asthma epidemic. New England Journal of Medicine 355:2226–35.

Fenton KA, Nicoll A & Kinghorn G 2001. Resurgence of syphilis in England: time for more radical and nationally coordinated approaches. Sexually Transmitted Infections 77:309–10.

Flack J & Colagiuri S 2005. Final report—ANDIAB 2004. Sydney: NADC-ANDIAB (National Association of Diabetes Centres—Australian National Diabetes Information Audit & Benchmarking).

Grassly NC, Wenger J, Durrani S et al. 2007. Protective efficacy of a monovalent oral type 1 poliovirus vaccine: a case-control study. Lancet 369:1356–62.

Guy RJ, McDonald AM, Bartlett MJ et al. 2007. HIV diagnoses in Australia: diverging epidemics within a low-prevalence country. Medical Journal of Australia 187:437–40.

Hamers FF, Devaux I, Alix J et al. 2006. HIV/AIDS in Europe: trends and EU-wide priorities. Euro Surveillance 11:E061123.1.

Hanna JN, Ritchie SA, Hills SL et al. 2002. Dengue in north Queensland. Communicable Diseases Intelligence 27:384–9.

Harling R, White JM, Ramsay ME et al. 2005. The effectiveness of the mumps component of the MMR vaccine: a case control study. Vaccine 23:4070–4.

Harvey R, Skelton-Robinson M & Rossor M 2003. The prevalence and causes of dementia in people under the age of 65 years. Journal of Neurology Neurosurgery and Psychiatry 74:1206-9.

Helps Y & Harrison JE 2004. Aboriginal and Torres Strait Islander reported injury mortality: Australia, 1997–2000. AIHW Cat. no. INJCAT 66. Adelaide: AIHW.

Helps Y & Harrison J 2006. Hospitalised injury of Australia's Aboriginal and Torres Strait Islander people 2000–02. Cat. no. 8 INJCAT 94. Adelaide: AIHW.

Henley G, Kreisfeld R, Harrison JE 2007. Injury deaths, Australia, 2003–04. Injury Research and Statistics Series no. 31. AIHW Cat. no. INJCAT 89. Adelaide: AIHW.

Hills SL, Piispanen JP, Humphreys JL et al. 2002. A focal, rapidly-controlled outbreak of dengue fever in two suburbs in Townsville, north Queensland, 2001. Communicable Diseases Intelligence 26:596–600.

IDF (International Diabetes Federation) 2006. Diabetes atlas, 3rd edition. Brussels: International Diabetes Federation.

Jamrozik K, Dobson A, Hobbs M et al. 2001. Monitoring the incidence of cardiovascular disease in Australia. Cat. no. CVD 16. Canberra: AIHW.

Jin F, Prestage, GP, Kippax SC et al. 2005. Epidemic syphilis among homosexually active men in Sydney. Medical Journal of Australia 183:179–83.

Johnson D 2004. Evidence-based guide to slowing the progression of early renal insufficiency. Internal Medicine Journal 34:50–7.

Kreisfeld R & Harrison J 2005. Injury deaths, Australia, 1999. Injury Research and Statistics Series no. 24. AIHW Cat. no. INJCAT 67. Adelaide: AIHW.

Li J, Hampson A, Roche P et al. 2005. Annual report of the National Influenza Surveillance Scheme, 2006. Communicable Diseases Intelligence 29:125–36.

Liu C, Johansen C, Kurucz N et al. 2006. Communicable Diseases Network Australia National Arbovirus and Malaria Advisory Committee annual report, 2005–06. Communicable Diseases Intelligence 30:411–29.

Lobo A, Launer L, Fratiglioni L, Andersen K, Carlo AD, Breteler M et al. 2000. Prevalence of dementia and major subtypes in Europe: a collaborative study of population-based cohorts. Neurology 54:S4–S9.

Mannino DM 2001. Chronic obstructive pulmonary disease: epidemiology and evaluation. Hospital Physician (October):22–31.

Mannino DM, Homa DM, Akinbami LJ et al. 2002. Chronic obstructive pulmonary disease surveillance: United States, 1971–2000. Morbidity and Mortality Weekly Report 51(SS–6):1–16.

Marmot M 2005. Social determinants of health inequalities. Lancet 365:1099–104.

McDonald SP, Chang S & Excell L 2007. ANZDATA Registry report 2007. Adelaide: Australia and New Zealand Dialysis and Transplant Registry.

McDonald SP, Excell L & Shtangey (eds.) 2006. New patients. In: McDonald SP & Excell L (eds.) ANZDATA Registry rReport 2005. Adelaide: Australia and New Zealand Dialysis and Transplant Registry.

McIntyre PB, Gilmour RE, Gilbert GL et al. 2000. Epidemiology of invasive pneumococcal disease in urban New South Wales, 1997–1999. Medical Journal of Australia 173:S22–6.

Mouzos J & Houliaras T 2006. Homicide in Australia 2004–05 National Homicide Monitoring Program (NHMP) annual report. Research and public policy series no. 72. Canberra: Australian Institute of Criminology.

Najafi F, Dobson AJ & Jamrozik K 2006. Is mortality from heart failure increasing in Australia? An analysis of official data on mortality for 1997–2003. Bulletin of the World Health Organization 84:722–8.

National Health and Medical Research Council 2003. Australian immunisation handbook, 8th edition. Viewed 13th December, 2007, <www9.health.gov.au/immhandbook>.

NCCI (National Cancer Control Initiative) 2003. The 2002 national non-melanoma skin cancer survey: a report by the NCCI Non-melanoma Skin Cancer Working Group. Melbourne: NCCI.

NCHECR (National Centre in HIV Epidemiology and Clinical Research) 2007. Annual surveillance report: HIV/AIDS, viral hepatitis and sexually transmitted infections in Australia. Sydney: NCHECR.

NHPC (National Health Performance Committee) 2004. National report on health sector performance indicators 2003. AIHW Cat. no. HWI 78. Canberra: AIHW.

NNDSS (National Notifiable Diseases Surveillance System) 2007. National notifiable diseases surveillance system tables. Viewed 5 February, 2008, <www9.health.gov.au>.

NPHP (National Public Health Partnership) 2005a. The National Injury Prevention and Safety Promotion Plan: 2004–2014. Canberra: NPHP.

NPHP 2005b. National Falls Prevention for Older People Plan: 2004 onwards. Canberra: NPHP.

NPHP 2005c. National Aboriginal and Torres Strait Islander Safety Promotion Strategy. Canberra: NPHP.

OECD (Organisation for Economic Cooperation and Development) 2007. Health at a glance: OECD indicators. Paris: OECD.

OzFoodNet Working Group 2006a. OzFoodNet quarterly report, 1 July to 30 September 2006. Communicable Diseases Intelligence 30:467–70.

OzFoodNet Working Group 2006b. OzFoodNet quarterly report, 1 April to 30 June 2006. Communicable Diseases Intelligence 30:381–4.

OzFoodNet Working Group 2006c. OzFoodNet quarterly report, 1 January to 31 March 2006. Communicable Diseases Intelligence 30:228–32.

OzFoodNet Working Group 2007a. OzFoodNet quarterly report, 1 April to 30 June 2007. Communicable Diseases Intelligence 31:314–8.

OzFoodNet Working Group 2007b. OzFoodNet quarterly report, 1 January to 31 March 2007. Communicable Diseases Intelligence 31:234–9.

OzFoodNet Working Group 2007c. OzFoodNet quarterly report, 1 October to 31 December 2006. Communicable Diseases Intelligence 31:128–33.

Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat 2006. World population prospects: the 2006 revision and world urbanization prospects: the 2005 revision. Viewed 14th December, 2007, <esa.un.org/unpp>.

Quinn HE & McIntyre PB 2007. Pertussis epidemiology in Australia over the decade 1995–2005—trends by region and age group. Communicable Diseases Intelligence 31(2):205–15.

Raphael B, Schmolke M & Wooding S 2005. Links between mental and physical health and illness. In: Herrman H, Saxena S & Moodie R (eds). Promoting mental health: concepts, emerging evidence, practice. Geneva: World Health Organization.

Rennard SI 1998. COPD: overview of definitions, epidemiology, and factors influencing its development. Chest 113:235S–41S.

Roche P, Krause V, Cook H et al. 2007a. Invasive pneumococcal disease in Australia, 2005. Communicable Diseases Intelligence 31:86–100.

Roche P, Bastian I, Krause V et al. 2007b. Tuberculosis notifications in Australia, 2005. Communicable Diseases Intelligence 31:71–80.

Rosenstein NE, Perkins BA, Stephens DS et al. 2001. Meningococcal disease. New England Journal of Medicine 344:1378–88.

Senanayake S 2006. Dengue fever and dengue haemorrhagic fever—a diagnostic challenge. Australian Family Physician 35:609–12.

Senanayake S 2007. Clinical cases in infectious diseases: a public health approach. Sydney: McGraw-Hill.

Shaw JE & Chisholm DJ 2003. Epidemiology and prevention of type 2 diabetes and the metabolic syndrome. Medical Journal of Australia 179:379–83.

Slade GD, Spencer AJ & Roberts Thomson KF (eds) 2007. Australia's dental generations: the National Survey of Adult Oral Health 2004–06. AIHW Cat. no. DEN 165. Canberra: AIHW Dental Statistics and Research Series No. 34.

Stephenson S, Henley G, Harrison J & Langley J. 2003. Diagnosis-based injury severity scaling. AIHW Cat no. INJCAT 59. Adelaide: AIHW.

UNAIDS 2006. A global view of HIV infection: 2006 global report prevalence map. Geneva: UNAIDS. Viewed 10th December, 2007, <data.unaids.org>.

Vajdic CM, Middleton M, Bowden FJ et al. 2005. The prevalence of genital Chlamydia trachomatis in Australia 1997–2004: a systematic review. Sexual Health 2:169–83.

van Holst Pellekaan SM & Clague L 2005. Toward health and wellbeing for Indigenous Australians. Postgraduate Medical Journal 81:618–24.

Virjee S, Robinson S & Johnston DG 2001. Screening for diabetes in pregnancy. Journal of the Royal Society of Medicine 94:502–9.

WHO (World Health Organization) 2005. Pertussis vaccines—WHO position paper. Weekly Epidemiological Record 80:31–9.

WHO 2007a. Mumps virus vaccines. Weekly Epidemiological Record 82:51–60.

WHO 2007b. Global health atlas. Viewed 14th December, 2007, <www.who.int>.

WHO 2007c. Cumulative number of confirmed human cases of avian influenza A/(H5N1) reported to WHO. Viewed 18th December, 2007, <www.who.int>.

Zaher C, Halbert R, Dubois R et al. 2004. Smoking-related diseases: the importance of COPD. International Journal of Tuberculosis & Lung Disease 8(12):1423–8.

Zambon MC 1999. Epidemiology and pathogenesis of influenza. Journal of Antimicrobial Chemotherapy 44:3–9.

6

Health across the life stages

Key points

- Death rates among children and young people more than halved in the two decades to 2005, largely because of a reduction in injury-related deaths.
- More children are now being vaccinated against major preventable childhood diseases—with over 90% of children fully vaccinated at 2 years of age.
- Close to three in 10 children and young people are overweight or obese.
- Among young Australians, one in 10 had a long-term mental or behavioural problem in 2004–05 and mental disorders accounted for almost half of their total disease burden in 2003.
- The most common causes of death among people aged 25–64 years are coronary heart disease for males (16% of their deaths) and breast cancer for females (15%).
- For older Australians, the most prominent health conditions in terms of death and hospitalisation are heart disease, stroke and cancer.
- At age 65, Australian males can now expect to live to about 83 years and females to 86 years—about 6 years more than their counterparts a century ago.

As mentioned in Chapter 3, health can be discussed in many ways. Chapter 3 provided the important perspective of population groups, showing how health status and the things that influence it can vary significantly with people's circumstances. This chapter presents a further view of the health of Australians—that of 'life stages'. It covers a range of age groups, from babies (and their mothers), through the early childhood and adolescent stages, to the 'working age' years and finally to those aged 65 years and over.

The chapter begins with an overview of how some general factors vary with age, such as death rates, the main causes of death and hospitalisation rates. It then discusses the four age groups in turn, sketching their special social and personal features and summarising the main aspects of their health.

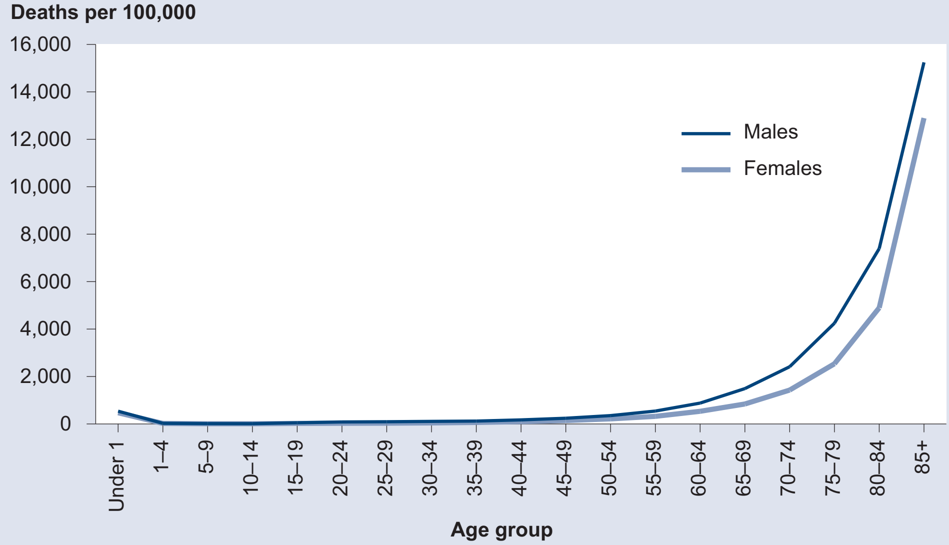
Why take this life stage perspective? First, several of these age groups are already a long established focus of the health system. For example, there are specialist health professionals and services dedicated to expectant mothers and childbirth, to infants and other children, and to the elderly. This chapter should be of special interest to those professionals.

Second, this approach can help to lay out a whole-of-life story that is difficult to obtain in other ways. It can be seen that some health problems are virtually confined to certain age groups but many problems—such as injury—run throughout life and only their prominence varies with age. Also, many problems may only become pronounced in older ages but their seeds begin in childhood with factors such as smoking, poor diet and obesity (see Chapter 4). Information such as this provides a long-range view that is important for health planning.

However, readers should note that the story presented here is only a rough guide to how health changes across the life stages because it relies on a 'snapshot' view of the various age groups as they are now, rather than following individuals over time. When today's children reach their later decades, for example, new social and medical circumstances may give them a different health profile from today's elderly.

6.1 How does health status vary with age?

Most aspects of health status vary with age, with problems usually increasing over the life stages. Death rates are an example where there is a marked increase with age. The exception is in the infant group (aged under 1 year) where death rates are much higher than for children overall and exceeded only by people in the 55–64 years age range (Figure 6.1). After infancy, the death rate drops dramatically, is at its lowest among those aged 10–14 years, and then increases progressively to a peak among those aged 85 years and over (see also Section 2.5 and Table 2.2).

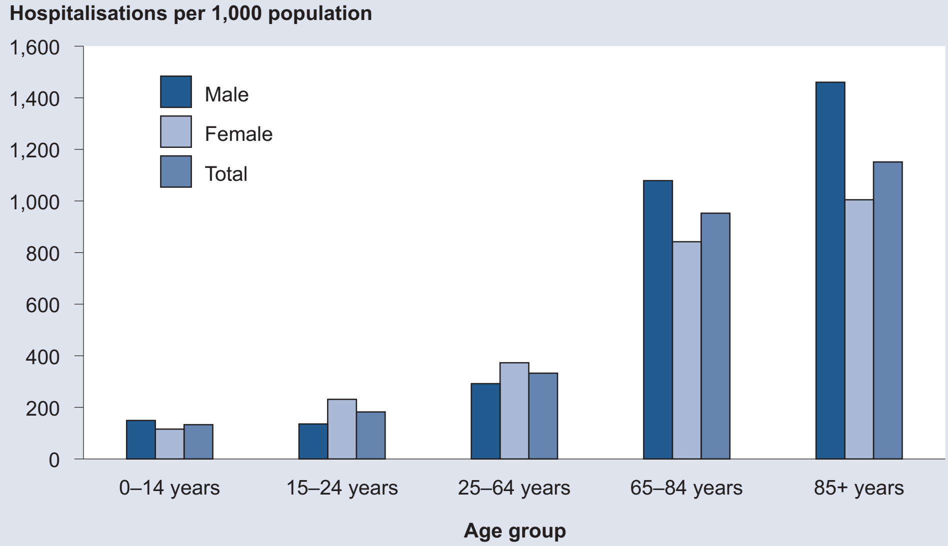


Source: AIHW National Mortality Database.

Figure 6.1: Number of deaths by age group, 2005

The leading causes of death also vary with age, reflecting different exposure to environmental factors and to the underlying ageing processes (see Section 2.5). For example, the most common causes of death for infants are conditions emerging from the perinatal period, followed by congenital anomalies. Injury and poisoning is the most common cause of death among children and young people and remains the leading cause among males aged 25–44 years. However, for females aged 25–44 years, cancer emerges as the most common cause of death. Cancer then becomes the most common cause of death among males and females aged 45–64 years, followed by cardiovascular disease. This pattern persists among males aged 65–84 years but cardiovascular disease becomes the most prominent cause of death for females of this age. For those aged 85 years and over, cardiovascular disease is the leading cause of death.

Information about the use of health services by different age groups provides another perspective on the health status of people at various life stages. For example, hospitalisation rates increase steadily across the age groups of interest in this chapter, from 133 per 1,000 children to the almost ninefold level of 1,150 among people aged 85 years and over (Figure 6.2).



Note: Hospital separation rates are based on all hospital separations, including same-day separations.
Source: AIHW National Hospital Morbidity Database, unpublished data.

Figure 6.2: Hospitalisation rates by age group, 2005–06

In the remainder of this chapter, information is presented for each selected life stage. Sections include information about various aspects of health (for example, self-reported health status, disability, mortality and use of health services) and key risk and protective factors for health (for example, smoking and alcohol consumption).

6.2 Mothers and babies

Recent years have seen some notable changes in births and the health of Australian mothers and babies. From 1991 to 2005, the number of births fluctuated between about 254,000 and 263,000 per year until 2004, before increasing sharply to over 270,000 in 2005. During this period, the proportion of multiple births increased, and perinatal mortality declined. This section presents information on these topics, as well as on birthweight, pre-term births and congenital anomalies. The statistics draw largely on three key sources: birth registration data and perinatal death registration data published annually by the Australian Bureau of Statistics (ABS) and data from the National Perinatal Data Collection published annually by the AIHW National Perinatal Statistics Unit. The latest available data are for births registered in 2006 (ABS), deaths registered in 2005 (ABS) and births occurring in 2005 (National Perinatal Data Collection) (ABS 2007a; Laws et al. 2007).

Further information on fertility is also presented in Chapter 2 (Section 2.1).

Mothers

Maternal age

There has been an upward trend in maternal age in recent years. Data from the National Perinatal Data Collection show that in 2005 the average age of all females who gave birth was 29.8 years, compared with 27.9 in 1991. The average age of first-time mothers was 28.0 years in 2005, an increase from 25.8 in 1991. In 2005, 4.4% of all females who gave birth were aged under 20 years (compared with 5.9% in 1991) and 20.4% were aged 35 years and over, an increase from 10.7% in 1991.

Method of birth

In 2005, about 6 in 10 females who gave birth had spontaneous vaginal births, about three in 10 had caesarean sections and just over one in 10 had births involving forceps, vacuum extraction or vaginal breech delivery (Table 6.1).

Nationally, the proportion of females having caesarean sections has increased markedly since 1991 (from 18.0% in 1991 to 30.3% in 2005). In 2005, of all females who gave birth, 17.9% had a caesarean section without labour and 12.4% had a caesarean section following labour. The proportion of females having caesarean sections was higher in private hospitals than in public hospitals (40.3% versus 27.1%)(*NHPC indicator 3.12*).

Statistics from 2005 show differences between states and territories in the use of interventions to assist in birth (Table 6.1). Western Australia, South Australia and Queensland reported caesarean rates above the national average (33.9%, 32.3% and 32.1% respectively). Victoria recorded the highest percentage of forceps delivery (6.0%), and Tasmania the lowest (1.0%). The percentage of vacuum extractions also varied, from a high of 9.9% in Western Australia to 5.7% in the Northern Territory.

Table 6.1: Method of birth, all mothers, by state and territory, 2005

Method of birth	NSW	Vic	Qld	WA	SA	Tas	ACT[(a)]	NT	Australia
					Number of mothers				
Total	89,139	65,427	54,336	26,529	17,896	5,820	4,995	3,651	267,793
					Per cent				
Spontaneous vaginal	61.2	56.2	59.6	53.5	55.8	64.6	58.3	62.3	58.5
Forceps	3.1	6.0	1.7	2.4	4.2	1.0	5.4	2.2	3.5
Vacuum extraction	7.1	7.1	6.2	9.9	7.3	7.8	6.8	5.7	7.2
Vaginal breech	0.4	0.4	0.4	0.4	0.4	0.1	0.6	0.7	0.4
Caesarean section	28.1	30.2	32.1	33.9	32.3	26.4	28.9	29.1	30.3
Labour	*11.9*	*12.7*	*12.2*	*11.9*	*15.4*	*13.8*	*10.4*	*12.8*	*12.4*
No labour	*16.2*	*17.5*	*19.9*	*22.0*	*16.8*	*12.6*	*18.5*	*16.3*	*17.9*
Not stated	*0.0*	—	—	—	—	—	—	—	*0.0*
Other	—	—	0.0	—	—	—	—	—	0.0
Not stated	0.0	0.0	—	—	—	—	—	—	0.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

(a) 15.5% of females who gave birth in the Australian Capital Territory (ACT) were non-ACT residents. Care must be taken when interpreting ACT percentages.

Note: For multiple births, the method of birth of the first born baby was used in these statistics.

Source: Laws et al. 2007.

Aboriginal and Torres Strait Islander mothers

As discussed in Chapter 2, the total fertility rate for Aboriginal and Torres Strait Islander females is higher than for all Australian females (estimated to be 2.1 babies and 1.8 babies respectively in 2006)(ABS 2007a). High fertility at younger ages is a contributor to this higher overall fertility for Indigenous females.

Aboriginal and Torres Strait Islander mothers tended to be younger (average age 24.9 years) than other mothers (29.9 years) for those giving birth in 2005 (Laws et al. 2007).

In 2006, the teenage birth rate for Indigenous females (69 babies per 1,000) was more than five times that for non-Indigenous females (13 babies per 1,000). For Indigenous females, the peak age group for births in 2006 was 20–24 years (125 babies per 1,000), followed by those aged 25–29 years (110). In contrast, the peak age group for births to non-Indigenous females was 30–34 years (120 babies per 1,000)(ABS 2007a).

In 2005, Indigenous mothers had higher rates of spontaneous vaginal birth (69.8%) than non-Indigenous mothers (58.1%) and lower rates of delivery by caesarean section (24.0% compared with 30.5%) (Laws et al. 2007).

Maternal mortality

Maternal deaths occur infrequently in Australia. The most recent triennial report, covering the period 2003–2005, reported 65 maternal deaths for the 3 years (Sullivan & Hall 2008). A maternal death is defined as:

> the death of a woman while pregnant or within 42 days of the termination of the pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes (WHO 1992).

Maternal deaths are classified into direct deaths (deaths from pregnancy complications such as embolisms and obstetric haemorrhage), indirect deaths (deaths from pre-existing diseases aggravated by pregnancy, such as heart disease) and incidental deaths, where the pregnancy was unlikely to have contributed significantly to the death (for example, car accidents and cancers).

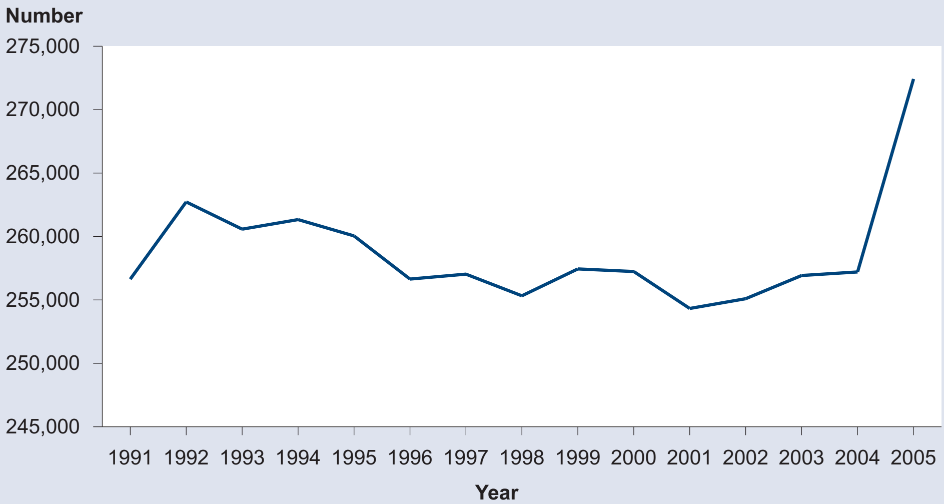
There were 29 direct maternal deaths (44.6% of the total) and 36 indirect deaths (55.4%) reported in 2003–2005. The leading causes of direct death were amniotic fluid embolism (8), hypertensive disorders of pregnancy (5) and thrombosis and thromboembolism (5). Almost half (16) of the 36 indirect deaths were attributed to heart and psychiatric conditions. In addition, there were 13 incidental deaths due to motor vehicle accidents, some cancers and infections that were deemed unlikely to have contributed significantly to the death. The maternal mortality ratio, calculated using direct and indirect deaths, was 8.4 deaths per 100,000 females who gave birth (Sullivan & Hall 2008). In comparison, the World Health Organization estimated that the ratio for the world was 400 deaths per 100,000 live births in 2000. The estimated ratio for developed regions (including Australia, New Zealand, United States of America, Europe, Japan and Canada) was 20 deaths per 100,000 live births and for developing countries it was 440 deaths (WHO 2004).

For the six year period 2000–2005, the maternal mortality for Aboriginal and Torres Strait Islander females was 31.5 per 100,000 females who gave birth, which was more than 3 times as high as the maternal mortality ratio for other females (8.8) (Sullivan & Hall 2008).

Babies

Births

In 2005, there were 272,419 births reported to the National Perinatal Data Collection, an average of 746 per day. These births included 270,440 live births and 1,979 fetal deaths. From 1991 to 2004, the number of births fluctuated between about 254,000 and 263,000 per year before increasing sharply by 5.9% in 2005 (Figure 6.3). The biggest increase was not seen in first-time pregnancies, but in females having their second or later babies.



Source: AIHW National Perinatal Statistics Unit, National Perinatal Data Collection 2007.

Figure 6.3: Number of births, 1991 to 2005

During the 20th century, Australia's number of registered births reached a peak in 1971, with 276,400. The number then fell sharply during the remainder of the 1970s, before increasing from the early 1980s to reach 264,200 in 1992. Over the following decade, the number of births generally declined, but increased from 2002 (ABS 2006a).

The crude birth rate, which is the number of live births per 1,000 population, was 12.8 in 2005, down from 14.1 in 1995. Australia's rate lies between those of the United Kingdom (12.0) and the United States (14.0). Among developed countries, Germany's and Japan's rates are relatively low (8.3 and 8.4 in 2005), and Ireland's relatively high (14.8) (see Table S4).

Data from the Australian and New Zealand Assisted Reproduction Database show that in 2005 there were 8,500 births in Australia to females who had assisted reproduction technology (ART) treatment. These births included 8,399 live births, 91 fetal deaths and 10 babies with an unknown birth outcome.

Sex

Male births exceed female births in developed countries, including Australia (Table S4). In 2005, Australia's male births accounted for 51.3% of all births (138,792 males compared with 131,550 females). This proportion was similar across the states and territories, and has changed little over time.

Multiple births

The rate of multiple births in Australia has risen steadily since the early 1980s. This can be attributed to an increasing average age of mothers giving birth and growing use of fertility drugs and assisted conceptions.

There were 8,871 twin and 284 triplet and higher order multiple births in 2005, representing 3.3% and 0.1% of all births in Australia, respectively. The associated multiple birth rate was 33.6 per 1,000 births, up from 26.9 in 1991.

Of the 8,500 births resulting from ART treatment, 25.5% (2,166) were multiple births. This included 2,094 twins (24.6%) and 72 higher order multiples (0.9%). See Chapter 7 for further information about ART treatment.

Gestational age

In 2005, the average gestational age of all babies born was 38.8 weeks. For babies of at least 20 weeks gestation born to females who had ART treatment, the average was 37.4 weeks. Figure 6.4 shows the differing distributions in gestational age at birth of all babies and babies born following ART.

The great majority of babies (90.7%) were born at term—that is, 37–41 weeks gestation. Only 1.2% of babies were born post-term, at 42 weeks or more gestation. Pre-term births—those occurring before 37 weeks gestation—may be associated with neonatal problems that cause significant illness and mortality in newborn babies and are sometimes associated with long-term disabilities. Of all births in 2005, 22,023 (8.1%) were pre-term. The Northern Territory had the highest proportion of pre-term births, 11.1% of all births, and Tasmania reported the lowest, 6.9%.

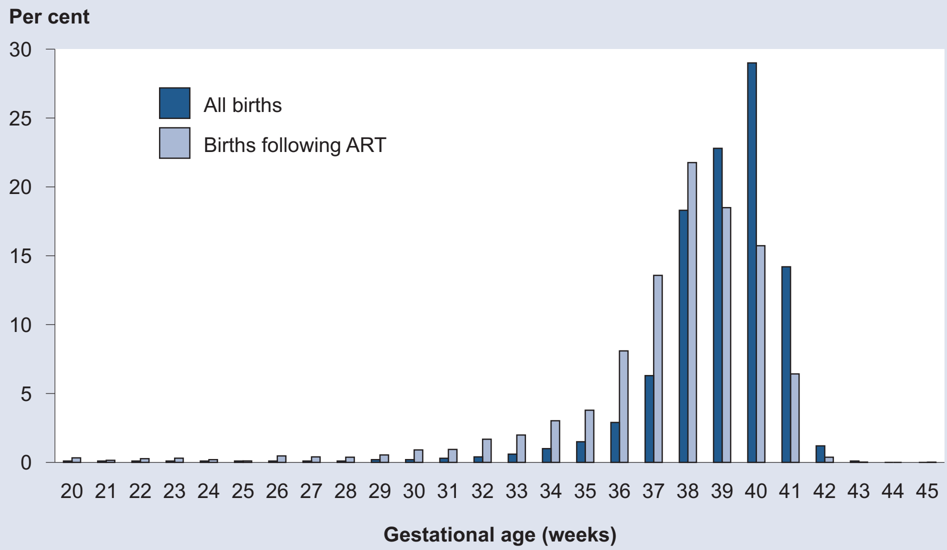


Figure 6.4: Distribution of gestational age for all births and births following assisted reproduction technology treatment, 2005

Pre-term birth was more likely for babies of multiple births. Whereas 6.5% of single births were pre-term, 53.1% of twins and 95.8% of higher order multiples were pre-term. Almost a quarter of babies born following ART treatment were pre-term (23.6%). Of ART twins, 61.3% were pre-term, and 91.7% of higher order multiples were pre-term.

Birthweight

A key indicator of infant health is the proportion of babies with low birthweight. These babies have a greater risk of poor health and dying, require a longer period of hospitalisation after birth, and are more likely to develop significant disabilities. The term 'low birthweight' is used when babies have a birthweight of less than 2,500 grams, 'very low birthweight' when the birthweight is less than 1,500 grams and 'extremely low birthweight' when it is less than 1,000 grams.

In 2005, 17,241 (6.4%) liveborn babies were of low birthweight, 2,875 (1.1%) were very low birthweight and 1,282 (0.5%, one in 200) were extremely low birthweight (*NHPC indicator 2.10*). The proportion of liveborn low birthweight babies ranged from 5.9% in New South Wales to 9.6% in the Northern Territory. Male liveborn babies were less likely to be low birthweight (5.9%) than female babies (6.9%). Of liveborn babies conceived after ART, 18.6% were low birthweight.

The average birthweight of liveborn babies in Australia in 2005 was 3,369 grams, ranging from 3,246 grams in the Northern Territory to 3,395 in Tasmania (Table 6.2). The average birthweight of liveborn male babies (3,427 grams) was about 4% (119 grams) higher than for female babies (3,307 grams). For liveborn single babies, the average birthweight was 3,402 grams, about 40% higher than for twins (2,407 grams) and more than double the average birthweight for triplets and other multiple births (1,668 grams). The average birthweight of liveborn babies conceived after ART was 3,069 grams.

Table 6.2: Live births by birthweight and state and territory, 2005

Birthweight (grams)	NSW	Vic	Qld	WA	SA	Tas	ACT[(a)]	NT	Australia
Average	3,379	3,368	3,376	3,343	3,352	3,395	3,362	3,246	3,369
					Number				
Total	90,073	66,041	54,905	26,783	18,066	5,874	5,041	3,657	270,440
					Per cent				
Less than 1,000	0.4	0.6	0.4	0.5	0.6	0.3	0.7	0.8	0.5
1,000–1,499	0.5	0.6	0.6	0.6	0.8	0.5	0.8	1.0	0.6
1,500–1,999	1.2	1.2	1.4	1.3	1.4	1.2	1.5	1.8	1.3
2,000–2,499	3.8	4.1	4.1	4.2	4.3	4.0	4.4	6.0	4.0
2,500–2,999	15.1	15.3	14.6	16.4	14.9	15.5	14.2	19.7	15.2
3,000–3,499	36.0	35.6	35.3	36.5	36.1	34.0	35.5	36.2	35.7
3,500–3,999	30.9	30.7	31.2	29.9	30.4	30.6	30.3	24.8	30.7
4,000–4,499	10.3	10.2	10.5	9.2	9.8	11.7	10.6	7.8	10.2
4,500 and over	1.8	1.8	1.8	1.4	1.6	2.1	2.0	1.8	1.8
Not stated	0.0	0.0	0.0	—	—	—	—	0.1	0.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Less than 1,500	*0.9*	*1.1*	*1.1*	*1.0*	*1.4*	*0.9*	*1.5*	*1.8*	*1.1*
Less than 2,500	*5.9*	*6.4*	*6.6*	*6.5*	*7.0*	*6.1*	*7.3*	*9.6*	*6.4*

(a) 15.5% of females who gave birth in the Australian Capital Territory (ACT) were non-ACT residents. Care must be taken when interpreting percentages.

Source: Laws et al. 2007.

Babies of Aboriginal and Torres Strait Islander mothers

In 2005, there were 9,865 live births and 117 fetal deaths recorded for mothers who identified as being Aboriginal or Torres Strait Islander in the National Perinatal Data Collection, representing 3.7% of all births (Laws et al. 2007). Based on ABS birth registration data, there were about 12,100 live births registered in 2005 where at least one parent was of Indigenous origin, representing about 5% of all live births (ABS 2006a).

Babies born to Indigenous mothers are much more likely to be pre-term and/or low birthweight than those born to other Australian mothers. In 2005, 13.9% of babies of Aboriginal and Torres Strait Islander mothers were classified as pre-term compared with 7.9% in babies of non-Indigenous mothers. The proportion of low birthweight in liveborn babies of Aboriginal and Torres Strait Islander mothers was 13.2% in 2005, more than twice that of babies of non-Indigenous mothers (6.1%). The average birthweight of liveborn babies of Indigenous mothers was 3,157 grams.

Admission to special care or intensive care nurseries

Among all liveborn babies in 2005, close to one in six (15.5%) were admitted to a special care nursery (SCN) or neonatal intensive care unit (NICU). The proportion was higher for multiple births, and especially for higher order multiple births (three or more babies). Of these higher order multiple live births, 94.2% were admitted to an SCN or NICU, compared with 60.1% of twins and 14.0% of single babies.

Perinatal mortality

Perinatal deaths are deaths that occur in the period shortly before or after birth. In this report, the count of perinatal deaths includes stillbirths (fetal deaths) and deaths of infants within the first 28 days of life (neonatal deaths), where the fetus or infant weighed at least 400 grams (or, if birthweight is unknown, had a gestational age of 20 weeks or more).

In 2005, there were 2,213 perinatal deaths registered—1,411 fetal and 802 neonatal deaths. Almost 3 in 10 (29.8%) of all registered perinatal deaths were not allocated a specific cause of death, since medical certifiers are often unwilling or unable to provide an accurate cause of death without the assistance of an autopsy. The main listed causes of perinatal deaths (originating in the fetus/infant) were congenital malformations, deformations and chromosomal abnormalities (18.8%), respiratory and cardiovascular disorders specific to the perinatal period (15.5%), and disorders related to length of gestation and fetal growth (14.0%) (ABS 2007b).

Overall, the perinatal death rate declined over the most recent decade (from 9.4 per 1,000 births in 1995 to 8.5 in 2005). Fetal deaths accounted for 63.8% of perinatal deaths, and neonatal deaths for 36.2%. The perinatal death rate for males (8.9 per 1,000 births) was higher than that for females (8.0)(ABS 2007b).

The perinatal death rate is also higher among Indigenous babies than non-Indigenous babies. For the period 2003–2005, there were 350 perinatal deaths of Indigenous infants in the four jurisdictions with the most complete coverage of Indigenous deaths (Queensland, Western Australia, South Australia and the Northern Territory). The rate of perinatal deaths over this period was 15.7 per 1,000 births for Indigenous babies compared with 10.3 per 1,000 births for non-Indigenous babies (ABS & AIHW 2008). (See Section 3.2 for information about Indigenous infant mortality).

Congenital anomalies

Congenital anomalies are structural or functional defects (for more information see Box 6.1). These conditions are major causes of morbidity and mortality during childhood. More severe conditions and anatomically obvious conditions are detected at or before birth. Some conditions may manifest later in life or may not manifest at all during the lifetime.

The collection of data on these conditions has enabled their prevalence to be monitored over time, facilitated health service planning and research activities, and assisted in monitoring the impact of related health interventions (for example, the mandatory folic acid fortification of flour). Some conditions have shown a declining trend at birth, mainly because of early detection and termination of pregnancy at early stages. The rate of pregnancy termination is higher for severe congenital anomalies than for surgically correctable conditions.

Box 6.1: Congenital anomalies

Neural tube defects:

- Anencephaly: Total or partial absence of the cranial vault, the covering skin, and the brain tissue.
- Spina bifida: Non-closure of the spine during development, producing external exposure of the spinal cord and/or its coverings (the meninges).
- Encephalocele: Protrusion of the brain tissue and its coverings outside the skull (covered by normal or defective skin).

Cleft lip or cleft palate: A cleft lip is a narrow opening or gap in the skin of the upper lip that extends all the way to the base of the nose. A cleft palate is an opening between the roof of the mouth and the nasal cavity caused by abnormal facial development.

Polydactyly: Presence of extra fingers or toes. It can affect the hand, the foot, or both.

Limb reduction defects: Total or partial absence or severe failure of limb skeletal structures to grow.

Renal agenesis or dysgenesis: One or both of the kidneys are absent or severely abnormal in their development.

Trisomy 18: A genetic disorder associated with the presence of extra material from chromosome 18. The extra material interferes with normal development and is associated with multiple abnormalities and mental retardation.

Trisomy 21 (Down syndrome): A genetic disorder caused by the presence of all or part of an extra chromosome 21. Down syndrome is associated with impairment of cognitive ability and physical growth as well as a distinctive/characteristic facial appearance.

Data on congenital anomalies detected at birth (live births, stillbirths and terminations of pregnancy at or after 20 weeks gestation) are collected by all jurisdictions except the Northern Territory. The rates at birth presented below are therefore based on all states and the Australian Capital Territory. Only four states collect information about terminations of pregnancy at less than 20 weeks gestation—New South Wales, Victoria, South Australia and Western Australia. Therefore, estimated rates of congenital anomalies are based on data from those four states and include anomalies detected and terminated before 20 weeks of pregnancy. This rate is an estimate, rather than a count, because the total number of terminations of pregnancy is unknown. However, these rates are likely to be underestimates because the number of anomalies aborted spontaneously is not known. See Box 6.1 for definitions of the selected birth anomalies.

Neural tube defects are relatively common severe congenital anomalies and include anencephaly, spina bifida and encephalocele. These anomalies are due to incomplete closure of the neural tube at the end of the fourth week of embryonic life. Some of these conditions are incompatible with life and some babies survive with lifelong neurological problems.

In 2001, the reported rate of neural tube defects at birth was 4.4 per 10,000 births and the estimated rate was more than 2 times as high, at 10.6. Both these rates were slightly lower in 2001 than their counterparts in 1998 (5.0 and 11.4 respectively) (Table 6.3).

Spina bifida is the most common condition arising from neural tube defects. In 2001, the rate at birth was 2.9 per 10,000 births, a slight reduction from 3.2 in 1998. Similarly, the estimated rate of spina bifida in 2001 was 5.4 per 10,000 births, compared with 5.9 in 1998. Anencephaly is not compatible with life and the estimated rate at birth was 4.4 per 10,000 births in 2001.

Studies have shown that increased folic acid around the time of conception can reduce the occurrence of neural tube defects. In June 2007, the Australia and New Zealand Food Regulation Ministerial Council issued a joint communiqué on mandatory fortification of folic acid to wheat flour for bread-making. This public health initiative has previously been adopted in a number of other countries to reduce the prevalence of neural tube defects. The implementation of the standard is expected to occur over a period of two years.

Table 6.3: Most common congenital anomalies reported to the Australian Congenital Anomalies Monitoring System

	1998			2001		
	Number[(a)]	Rate at birth[(b)]	Estimated rate[(c)]	Number[(a)]	Rate at birth[(b)]	Estimated rate[(c)]
Neural tube defects	127	5.0	11.4	111	4.4	10.6
Cleft lip and cleft palate	244	9.7	11.4	230	9.2	9.9
Polydactyly	226	9.0	9.9	227	9.1	10.2
Limb reduction defects	128	5.1	6.4	115	4.6	5.8
Renal agenesis/dysgenesis	134	5.3	6.7	132	5.3	5.7
Trisomy 18	59	2.3	6.5	44	1.8	6.0
Trisomy 21 (Down syndrome)	279	11.1	21.1	280	11.2	23.2

(a) Numbers are for the actual rate at birth, not the estimated rate. Numbers based on data from four states: New South Wales, Victoria, Western Australia and South Australia.

(b) Birth rates are per 10,000 births (live births and fetal deaths).

(c) Estimated rates are per 10,000 births (live births and fetal deaths), including anomalies detected and terminated before 20 weeks of pregnancy.

Source: Australian Congenital Anomalies Monitoring System unpublished data.

With increasing maternal age in Australia, more pregnancies are affected by chromosomal abnormalities. A large number of fetuses identified with Down syndrome (trisomy 21) are now being terminated in early pregnancy. There were 11.2 per 10,000 births of Down syndrome in 2001 and the estimated rate of cases increased more than twofold when early terminations before 20 weeks were included. The rate of trisomy 18 increased threefold when early terminations were added (from 1.8 to 6.0 per 10,000 births in 2001).

6.3 Children and young people

This section provides an overview of the health and wellbeing of Australia's children and young people. For more detailed information refer to *A picture of Australia's children 2005* and *Young Australians: their health and wellbeing 2007* (AIHW 2005, 2007a). Children are defined here as boys and girls aged under 15 years and young people as those aged 15–24 years.

Children

Childhood, particularly early childhood, is a period in which the foundations for children's later health and wellbeing are established. During this period, children acquire a vast range of skills and behaviours through their family, social and school environments. These experiences, along with biological factors, all influence children's physical and psychological health, their behaviour and their educational achievements (Patton et al. 2005; Prior et al. 2000; Zubrick et al. 2000).

In 2006, almost 4 million Australians (20% of the total population) were children aged under 15 years. Of these, 2.0 million were boys and 1.9 million were girls. There were around 171,000 Aboriginal and Torres Strait Islander children in 2006, constituting 4.3% of all children (ABS 2007c). The Indigenous population has a much younger age structure than the non-Indigenous population—in 2001, children made up 39% of Indigenous Australians and 20% of non-Indigenous Australians (ABS & AIHW 2005).

Health status

Most Australian children enjoy good health, as indicated by low and declining rates of infant and childhood deaths, and declines in specific conditions such as communicable diseases and injuries. However, there are a number of areas of concern, including high rates of overweight and obesity, insufficient physical activity and poor eating habits, mental health problems, and long-term health conditions such as asthma and diabetes.

According to the ABS 2003 Survey of Disability, Ageing and Carers, 8% of children had a disability (around 320,000 children)—much less than the overall disability rate of 20%. Around half (52%) of all children with disability had a severe or profound core activity limitation, indicating they sometimes or always needed assistance with activities of daily living, and 62% had schooling limitations (ABS 2004).

In 2005–06, there were 536,978 hospitalisations among children—this was 7% of all hospitalisations. Hospitalisation rates were higher for boys than girls (14,807 compared with 11,478 hospitalisations per 100,000 children, respectively), and 26% of all child hospitalisations were of infants (children aged under 1 year). The most common reason for hospitalisation among children overall was for respiratory conditions (17%), followed by injury and poisoning (13%) (Table 6.4). However, injury and poisoning was the leading cause of hospitalisation among children aged 10–14 years.

Table 6.4: Most common causes of hospitalisations[(a)] for children aged 0–14 years, 2005–06

	0–4 years		5–9 years		10–14 years		Total	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Respiratory conditions	60,600	19.8	22,068	18.1	10,541	9.7	93,209	17.4
Injury and poisoning	22,865	7.5	20,191	16.6	24,567	22.6	67,623	12.6
Digestive conditions	19,358	6.3	18,261	15.0	16,276	15.0	53,895	10.0
Perinatal conditions	53,922	17.6	57	0.0	36	0.0	54,015	10.1
Infectious and parasitic diseases	30,031	9.8	7,056	5.8	4,050	3.7	41,137	7.7
Other conditions	119,803	39.0	54,260	44.5	53,036	49.0	227,099	42.2
Total	**306,579**	**100.0**	**121,893**	**100.0**	**108,506**	**100.0**	**536,978**	**100.0**

(a) All hospital separations, including same-day separations.

Source: AIHW National Hospital Morbidity Database.

Long-term health conditions

Based on the 2004–05 National Health Survey (NHS), about 41% of Australian children had a long-term health condition—that is, a condition which has lasted or is expected to last for 6 months or more. The most commonly reported conditions were asthma (12%), hayfever and allergic rhinitis (8%) and other allergies (6%) (ABS 2006b).

The prevalence of asthma among children remained steady between 2001 and 2004–05 (13% and 12%, respectively), with boys continuing to have slightly higher rates than girls (13% and 10% respectively in 2004–05) (ABS 2002, 2006b; 2004–05 NHS unpublished data). Of the estimated 451,500 children with asthma in 2004–05, almost half (46%) had taken a health action for their asthma in the previous 2 weeks—44% of all children with asthma took medication, 6% consulted a GP/specialist and 7% had days away from school or days of reduced activity (ABS 2006b). In 2005–06, there were 21,363 hospitalisations for asthma among 0–14 year olds, representing 4% of all hospitalisations for this age group (AIHW National Hospital Morbidity Database).

The rate of new cases of Type 1 diabetes in children is increasing in Australia and is high compared with that of other countries; a recent study found Australia is among the 10 countries with the highest incidence of Type 1 diabetes among children (AIHW: Catanzariti et al. 2007; IDF 2006). In 2005, the National Diabetes Register recorded 901 new cases of Type 1 diabetes among children aged under 15 years. The rate of 23 new cases per 100,000 children represents a significant increase from 19 in 2000. In 2005–06, there were 2,813 hospitalisations of children for diabetes, representing less than 1% of all hospitalisations for this age group (AIHW National Hospital Morbidity Database). Type 1 diabetes accounted for nearly all (97%) diabetes hospitalisations for children, and Type 2 diabetes was responsible for 1%. Available data sources do not currently provide reliable national estimates of the prevalence of Type 1 or Type 2 diabetes among children and young people.

In 2004, there were 610 new cases of cancer diagnosed among children, a rate of 15 per 100,000 children—a similar rate to 1994. By comparison, the all-ages cancer incidence rate in 2004 was 474 per 100,000 persons. The risk of most cancers increases with age and most types of cancer are uncommon in children. The most common cancers affecting children in 2004 were leukaemia (37% of all childhood cancers) and brain cancer (12%) (AIHW cancer incidence data cubes).

Based on parents' reports, 7% of Australian children had a long-term mental or behavioural problem in 2001 and 2004–05 (ABS 2002, 2006a). From the 1997 National Survey of Mental Health and Wellbeing it was estimated that around one in seven (14%) children aged 4–14 years had a mental health problem in 1998—13% of children aged 6–14 years had attention deficit hyperactivity disorder (ADHD), 3% had conduct disorder and 3% depressive disorder (AIHW 2005). These estimates were based on parents' responses to a diagnostic interview schedule and behaviour checklists for children.

Injury

Injury is the leading cause of death and a major cause of disability among Australian children (AIHW 2005). The 2004–05 NHS indicated that one in four children (25%) had some kind of injury in the previous 4 weeks that required a 'health action' (self-help or professional help) (ABS 2006b).

In 2005–06, injury (including poisoning) was the second leading cause of hospitalisations for children overall, and the leading cause of hospitalisation for those aged 10–14 years. In this period there were 67,623 hospitalisations for injury among children, accounting for 13% of all their hospitalisations. The boys' hospitalisation rate for injury was almost twice that of girls (2,025 compared with 1,303 hospitalisations per 100,000 children). The most common causes of injury hospitalisations among children were falls (38% of all their injury hospitalisations), transport and pedestrian accidents (14%), and hitting something or being hit or crushed by something (8%) (AIHW National Hospital Morbidity Database). (See also Section 5.10 on injury.)

Dental health

In 2001, 60% of 12 year olds had no dental caries (decayed, missing or filled teeth) in their permanent teeth—an increase from 42% in 1991. In line with this trend, the average number of teeth with dental caries had also declined over this period, from 1.26 to 0.95 (AIHW 2007a). The 2002 National Dental Telephone Interview Survey found that almost nine in ten (88%) children aged 5–11 years had visited a dentist within the previous 12 months, and 98% had visited a dentist in the previous 2 years. Almost three in four (73%) children in this age group attended their last dental visit for a check-up rather than for a specific problem (Carter & Stewart 2003).

Vaccine-preventable diseases

More children are now being vaccinated against major preventable childhood diseases. Data from the Australian Childhood Immunisation Register indicate that the proportion of children who had been fully vaccinated at 1 year of age rose from 76% to 91% between 1997 and 2007. Similarly, the proportion fully vaccinated at 2 years of age increased from 66% to 92% between 1998 and 2007 (Medicare Australia 2007). (See Section 4.5 for further information about vaccination rates.)

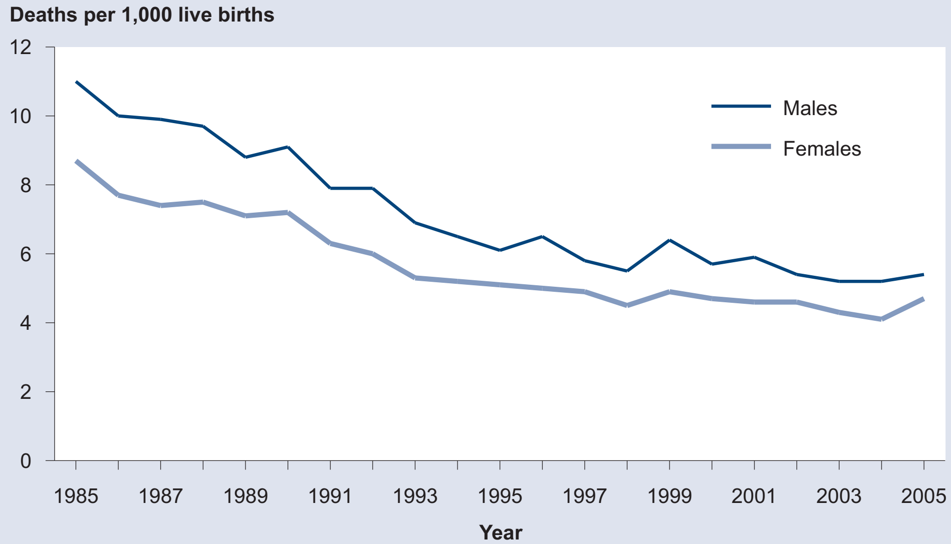
In line with this trend, the notification rates for a number of vaccine-preventable diseases have been steadily declining. Between 1996 and 2006, aged-standardised notification rates for rubella and measles rapidly decreased—for rubella, from 21.4 to 0.1 per 100,000 children, and for measles, from 12.2 to 1.7. In 2006, there were no cases of polio, tetanus or diphtheria among children aged under 15 years (National Notifiable Diseases Surveillance System 2007).

Mortality

In 2005, there were 1,831 deaths among Australian children, representing 45 deaths per 100,000 children. Over the two decades to 2005, child death rates more than halved (from 94 deaths per 100,000 children in 1985). Most of the child deaths in 2005, 71%, occurred among infants (children under 1 year of age) (AIHW National Mortality Database).

Australian infant mortality rates halved between 1985 and 2005—from 10 to 5 deaths per 1,000 live births (Figure 6.5). The death rates for male infants have remained consistently higher than for female infants over this period. In 2005, the major causes of infant death were conditions originating in the perinatal period (51% of all infant deaths), congenital malformations (24%) and sudden infant death syndrome (7%). Based on data from Queensland, Western Australia, South Australia and Northern Territory, the death rate among Indigenous infants was three times that of non-Indigenous infants in 1999–2003—among males, 15 compared with 5 deaths per 1,000 live births; among females, 12 compared with 4 (ABS & AIHW 2005).

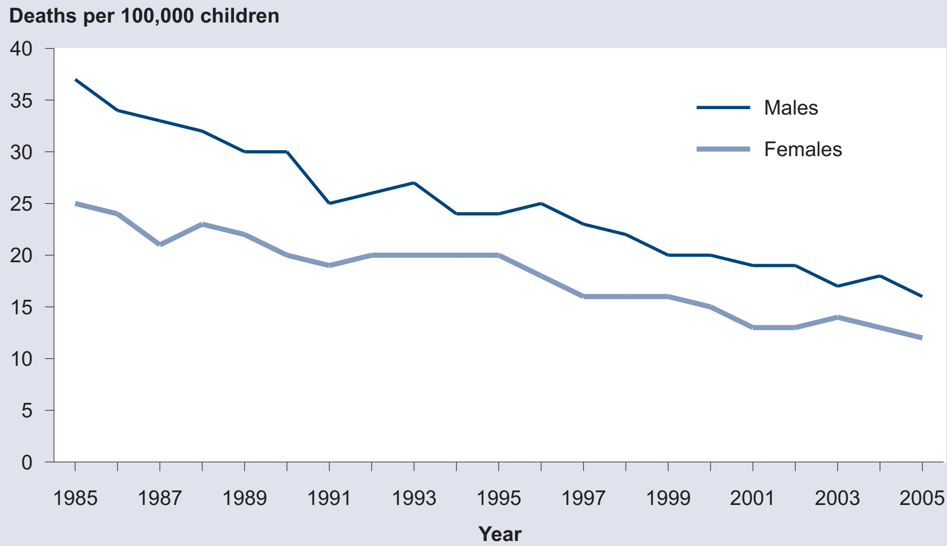
Despite their considerable fall over time, Australia's infant mortality rates do not compare favourably with other OECD countries. In 2005, although below the OECD average infant mortality rate of 5.4 deaths per 1,000 live births, Australia's infant mortality rate (5.0) was ranked twentieth among OECD countries—meaning that 19 other countries had lower rates. By comparison, Iceland had the lowest infant mortality rate with 2.3 deaths per 1,000 live births, and Turkey had the highest at 23.6 (OECD 2007).



Source: AIHW National Mortality Database.

Figure 6.5: Infant mortality rates, 1985–2005 (*NHPC indicator 1.07*)

Similar to the trends among infants, mortality rates among children aged 1–14 years more than halved between 1985 and 2005 (from 31 to 14 deaths per 100,000). They also remained consistently higher among boys (Figure 6.6).



Source: AIHW National Mortality Database.

Figure 6.6: Mortality rates for children aged 1–14 years, 1985–2005

Injury (including poisoning) remains the leading cause of death among children aged 1–14 years—189 deaths in 2005, which was 36% of all deaths among this age group. Transport accidents and accidental drowning were the most common causes of injury deaths (67 and 32 deaths respectively). Other leading causes of mortality among children aged 1–14 years include cancer (89 deaths, 17% of all child deaths), and diseases of the nervous system, such as cerebral palsy and epilepsy (46 deaths, 9% of all deaths). There was a major decline in the rate of deaths due to transport accidents and accidental drowning between 1985 and 2005—transport accident deaths declined from 8 to 2 per 100,000 children, and accidental drowning deaths declined from 3 to 1 per 100,000.

Based on data from Queensland, Western Australia, South Australia and the Northern Territory, the mortality rate among Indigenous children is around three times that of non-Indigenous children (41 deaths compared with 14 per 100,000 children aged 1–14 years in 2003–2005).

Health risk and protective factors

Nutrition, physical activity and body weight

Breastfeeding plays a major role in protecting infants against infection and chronic diseases such as diabetes and asthma, and it has been suggested that it also reduces the risk of obesity in childhood (NHMRC 2003). The 2004–05 NHS indicated that 88% of children aged 0–3 years had been breastfed, a similar proportion to 2001 and 1995 (87% and 86%, respectively) (AIHW 2007b). The National Health and Medical Research Council dietary guidelines suggest that it is an achievable goal to have 80% of Australian mothers still breastfeeding their child at 6 months (NHMRC 2003a). In 2001, less than half (48%) of all infants were receiving any breast milk at the age of 6 months, and none were being fully breastfed—that is, receiving only breast milk (and not breast milk substitutes or solids) (ABS 2003).

Poor eating habits (considering the quality and quantity of food consumed) and lack of physical activity are often cited as being prime contributors to the rising prevalence of overweight and obesity in developed nations (AIHW 2007a). However, there are limited national and recent data available on these issues relating to Australian children.

Data from the 2004–05 NHS indicated that only 26% of children aged 12–14 years met the national guidelines for daily fruit consumption and 28% met the consumption guidelines for vegetables—three serves of fruit and four serves of vegetables per day (DoHA & NHMRC 2005).

The 2004 NSW Schools Physical Activity and Nutrition Survey (SPANS) found that, among Year 6 students, 84–89% of boys and 72–80% of girls met the national recommendation for at least 1 hour of moderate-to-vigorous-intensity exercise each day. However, it was also found that Year 6 students engaged in 25 hours (median) of sedentary behaviour per week, and 61% of boys and 45% of girls were exceeding the recommended limit of 2 hours per day using electronic media for entertainment (for example, watching television or DVDs, or playing computer or console games) (Booth et al. 2006).

As indicated by the 2004 SPANS, among Year 4 and 6 students, 19–22% of boys and 16–22% of girls were overweight but not obese, and 7–9% of boys and 8% of girls were obese. The remaining 70% or so were considered to be a healthy weight (Booth et al. 2006).

Exposure to tobacco smoke

The harmful effects of inhaling environmental tobacco smoke, or passive smoking, and the impacts of smoking during pregnancy, are well documented (AIHW 2006b; Laws et al. 2007). In 2007, around 1 in 12 Australian households (8%) with children under 15 years had a household member that smoked inside the home—a decrease from 31% in 1995 (National Drug Strategy Household Survey). Data from New South Wales, Western Australia, South Australia, and the Australian Capital Territory reveal that 16% of females who gave birth in 2005 smoked during pregnancy—this proportion had declined steadily from 19% in these jurisdictions in 2001 (Laws et al. 2007; Laws & Sullivan 2004).

Sun protection

Sun exposure during childhood and adolescence is considered to be the most significant risk factor for developing melanoma skin cancer (AIHW 2007a). The 2003–04 National Sun Survey found that the most commonly reported sun protection behaviours used by children aged 0–11 years were wearing headwear (64% of respondents), using 15+ sunscreen (58%) and staying mainly in the shade (32%) (Cancer Council Australia 2007). From the 2004–05 NHS, around three in five children aged under 15 years (61%) had their skin regularly checked, by themselves or someone else, for changes in freckles or moles (ABS unpublished data).

Young people

Youth is a period of rapid emotional, physical and intellectual transition, where young people progress from being dependent children to independent adults. Young people face a range of life events and make decisions that can affect their immediate and longer term health and wellbeing. Features of this life stage may include final school years, decisions about further education, training and employment, leaving the family home and possibly parenthood and new family life. This is also a period where young people learn to drive and many have sexual experiences and experiment with alcohol, tobacco and perhaps other drugs. It follows that injuries (especially from traffic accidents), psychological problems and the harmful effects of alcohol and other drug use are prominent hazards for many young Australians.

In 2006, there were 2.7 million young people (that is, those aged 15–24 years) in Australia, accounting for 14% of the total population. Of these, 1.4 million were males and 1.3 million were females. This included around 86,000 Aboriginal and Torres Strait Islander young people, representing 3.2% of all young people in Australia (ABS 2007c).

Health status

Most young Australians are in good health, as indicated by self-reported health status and relatively low and declining morbidity and mortality. However, there are a number of health concerns that can affect them during youth and influence their health later in life. These include mental health problems, substance use, injury and high levels of overweight and obesity.

Most young people in Australia rate their own health favourably. According to the 2004–05 NHS, around 70% of young Australians rated their health as either 'excellent' or 'very good' and a further 24% rated it as 'good'. Only 7% rated their heath as either 'fair' or 'poor' (ABS 2006b).

From the Survey of Disability, Ageing and Carers, in 2003 there were around 251,300 young Australians (9%) with disability (ABS 2004). Of these, almost one in four (24%) had a severe or profound core activity limitation, indicating they sometimes or always needed assistance with activities of daily living, and 61% had employment limitations because of their disability (ABS 2004; AIHW 2007a).

In 2005–06, there were 519,139 hospitalisations among young people, comprising 7% of all hospitalisations. Female hospitalisation rates were higher than those for males (22,939 hospitalisations per 100,000 young people compared with 13,532). The most common reasons for hospitalisation among young people overall were pregnancy and childbirth (21%), digestive conditions (17%, with almost half of these due to embedded/impacted teeth) and injury and poisoning (15%) (Table 6.5).

Table 6.5: Most common causes of hospitalisations[(a)] for young people aged 15–24 years, 2005–06

	15–19 years		20–24 years		Total	
	Number	Per cent	Number	Per cent	Number	Per cent
Pregnancy and childbirth	29,025	13.5	78,993	26.0	108,018	20.8
Digestive conditions	39,646	18.4	46,087	15.2	85,733	16.5
Injury and poisoning	37,261	17.3	37,799	12.5	75,060	14.5
Mental and behavioural disorders	17,722	8.2	23,425	7.7	41,147	7.9
Respiratory conditions	14,072	6.5	11,957	3.9	26,029	5.0
Other conditions	77,819	36.1	105,342	34.7	183,152	35.3
Total	**215,536**	**100.0**	**303,603**	**100.0**	**519,139**	**100.0**

(a) All hospital separations, including same-day separations.

Source: AIHW National Hospital Morbidity Database.

Long-term health conditions

In the 2004–05 NHS, two-thirds of young people (66%) reported having a long-term health condition. The most commonly reported conditions were hayfever and allergic rhinitis (19%), short-sightedness (18%), asthma (12%) and back pain or disc disorder (9%) (ABS 2006b).

The prevalence of asthma among young Australians declined from 16% to 12% between 2001 and 2004–05 (ABS 2002, 2006b). Of the 333,100 young people with asthma in 2004–05, almost half (49%) had taken a health action for their asthma in the previous 2 weeks: 48% of all young people with asthma used medication and 6% consulted a GP/specialist (ABS 2006b). In 2005–06, there were 2,686 hospitalisations for asthma among 15–24 year olds, representing less than 1% of all hospitalisations among young Australians (AIHW National Hospital Morbidity Database).

In 2005, there were an estimated 425 new cases of Type 1 diabetes among 15–24 year olds, a rate of 15 new cases per 100,000 young people (the same rate as in 2000). In 2005–06, there were 3,704 hospitalisations of young people for diabetes. Type 1 accounted for the great majority (75%) of these hospitalisations and Type 2 was responsible for 4%. Hospitalisation rates were much higher among females than males (171 hospitalisations per 100,000 young females compared with 91 for young males), reflecting that 20% of all diabetes hospitalisations of young people were for gestational diabetes among young females (AIHW National Hospital Morbidity Database).

In 2004, there were 907 new cases of cancer diagnosed among young Australians, a rate of 32 per 100,000 young people—a similar rate to 1994 (31). By comparison, the all-ages cancer incidence rate in 2004 was over 14 times as high at 474 per 100,000 persons. Although cancer is generally more common among older age groups, it is still one of the leading causes of death among young Australians. The most common cancers affecting them in 2004 were melanomas (27% of all cancers among this age group), cancer of the testis (12%) and Hodgkin disease (12%) (AIHW cancer incidence data cubes).

In 2003, mental disorders were the leading contributor to the total burden of disease among young Australians, accounting for 49% of that total (AIHW 2007a). The NHS surveys indicate that one in ten young people had a long-term mental or behavioural problem in 2001 and 2004–05 (based on parent- and self-reports) (ABS 2002, 2006b). Of all respondents aged 18–24 years, one in six (16%) reported high or very high levels of psychological distress in 2004–05 (19% of females, 12% of males).

In 2005–06, there were 41,147 hospitalisations for mental and behavioural disorders among 15–24 year olds, a rate of 1,439 per 100,000 young people, accounting for 8% of all their hospitalisations. The rates were higher for young females than young males (1,709 per 100,000 young females compared with 1,182 for males). The most common reasons for mental and behavioural disorder hospitalisations among young males were substance use and schizophrenia (28% and 21% of these hospitalisations, respectively), whereas depressive episodes and eating disorders were the most common among young females (18% and 12% of these, respectively). In 2005–06, there were also 6,980 hospitalisations for intentional self-harm, a rate of 246 hospitalisations per 100,000 young people. The hospitalisation rate for intentional self-harm among females was more than twice that for males (345 and 152 hospitalisations per 100,000 females and males, respectively) (AIHW National Hospital Morbidity Database).

Injury

Injuries are common among young Australians and are the leading cause of their hospitalisations and deaths. In 2004–05, almost one in four young people (24%) had some kind of injury in the previous 4 weeks that required a 'health action' (self-help or professional help) (ABS 2006b). Among these young people, the most frequently reported types of injury were being cut (33%), hitting something or being hit by something (16%) and falling from a low height (16%).

Injury (including poisoning) was a leading cause of hospitalisation for young people in 2005–06 with 75,060 hospitalisations, representing 15% of all their hospitalisations. Injury hospitalisation rates were more than twice as high among young males as among young females (3,664 hospitalisations per 100,000 compared with 1,562). The most common causes of injury hospitalisations among young people were transport accidents (20% of all injury hospitalisations), falls (12%) and assault (10%) (AIHW National Hospital Morbidity Database).

Sexually transmitted infections

Sexually transmitted infections (STIs) can cause significant long-term morbidity and they remain a major public health concern in Australia (DoHA 2005). In 2006, there were 32,459 notifications for STIs among young Australians (a rate of 1,135 notifications per 100,000 young people), representing 55% of all STI notifications that year. Chlamydia notification rates more than tripled over the decade from 1996 to 2006, from 291 to 998 notifications per 100,000 young people, respectively. Similarly, notification rates for gonococcal infections almost doubled over this period (from 77 to 124 per 100,000). In contrast, syphilis notification rates are low and declining (from 23 to 13 notifications per 100,000 young people between 1996 and 2006) (National Notifiable Diseases Surveillance System 2007). In 2005, there were 88 HIV notifications for those aged 18–24 years (75 for males, 13 for females), a rate of four notifications per 100,000 in that age group, representing a slight decrease from six in 1995 (National Centre in HIV Epidemiology and Clinical Research, unpublished data).

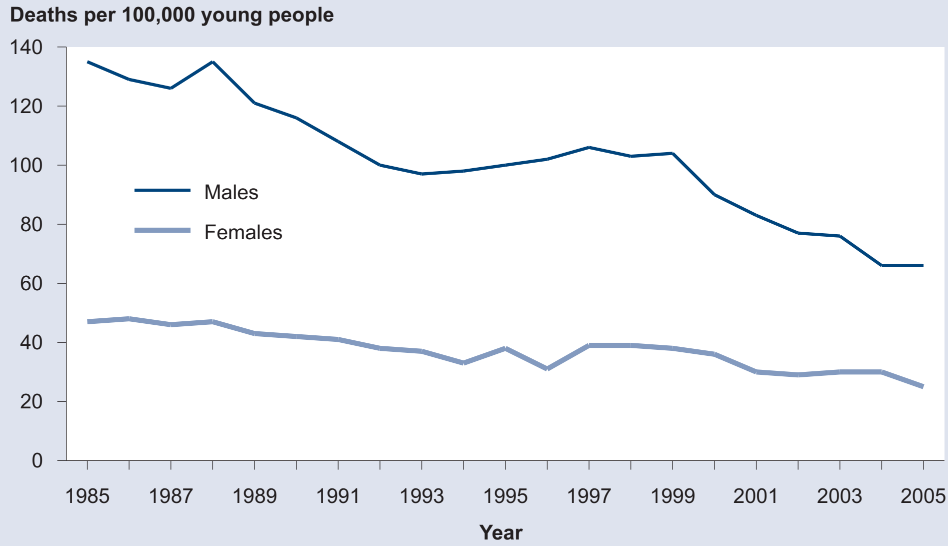
Mortality

In 2005 there were 1,309 deaths among young Australians—a rate of 46 deaths per 100,000 young people—with males accounting for 73% of these deaths. The male rates were consistently higher than those for females over the 20 years to 2005, but the rates for both halved (Figure 6.7) (AIHW National Mortality Database).

Injury (including poisoning) was the leading cause of death for young Australians in 2005—919 deaths, representing 70% of all deaths among this group. Motor vehicle traffic accidents and suicide were the main causes of these injury deaths (39% and 32% respectively). The overall decline in mortality among young people in the 20 years to 2005 can be attributed largely to a fall in the death rates from injury (including poisoning)—a fall from 68 to 32 deaths per 100,000 young people between 1985 and 2005. The injury death rates halved among males and females in both the 15–19 and 20–24 age groups over this period (Figure 6.8).

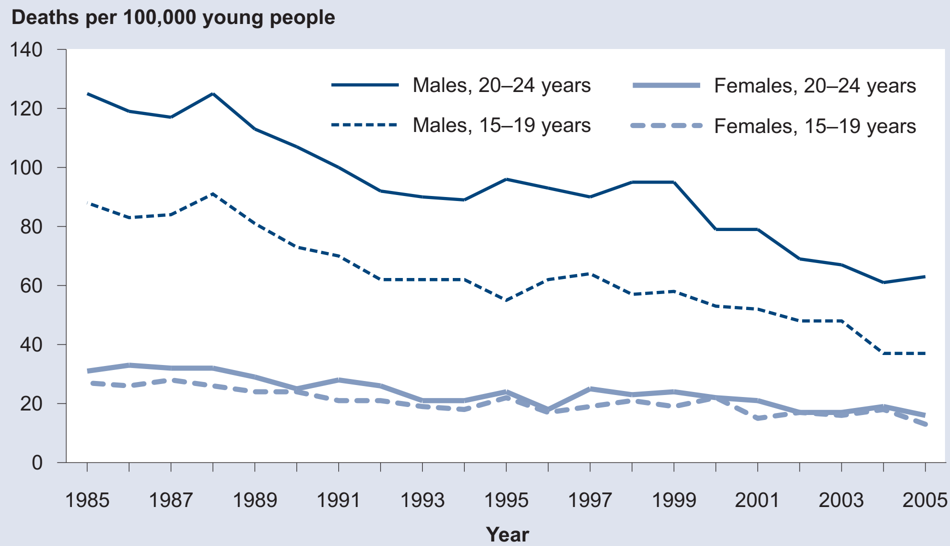
Cancers (malignant neoplasms) were also a leading cause of death among young Australians in 2005—114 deaths, accounting for 9% of all their deaths. Over a quarter (27%) of cancer deaths among young people were due to leukaemia, with a further 11% due to brain cancer.

Based on data from Queensland, Western Australia, South Australia and the Northern Territory, the mortality rate among young Indigenous Australians is almost three times that of non-Indigenous young people (146 deaths per 100,000 young people compared with 51, in 2003–2005).



Source: AIHW National Mortality Database.

Figure 6.7: Mortality for young people aged 15–24 years, 1985–2005



Source: AIHW National Mortality Database.

Figure 6.8: Deaths from injury (including poisoning) among those aged 15–24 years, 1985–2005

Health risk and protective factors

Nutrition, physical activity and body weight

Poor eating habits, low levels of physical activity and being overweight or obese are linked to a range of immediate and long-term health problems (AIHW 2007a). For young people aged 15–18 years, the national recommendations are for three serves of fruit and four serves of vegetables each day, and for people aged 19 years and over, two serves of fruit and five serves of vegetables per day are recommended (DoHA & NHMRC 2005). In 2004–05, 37% of young people met the daily fruit consumption guidelines and 10% reported they did not usually eat any fruit. Around one in six young people (16%) met the daily vegetable consumption guidelines (2004–05 NHS unpublished data).

According to the 2004–05 NHS, 46% of males and 30% of females aged 15–24 years participated in levels of physical activity as recommended in the national guidelines to obtain a health benefit (AIHW 2007a). More young females (32%) than males (23%) were sedentary, or undertook low levels of physical activity (38% and 31%, respectively).

Based on self-reported height and weight, 29% of young people aged 18–24 years were considered overweight or obese in 2004–05 (22% overweight, 7% obese). This is an increase from 1995, when 17% were considered overweight and 5% obese (ABS 2006b).

Tobacco, alcohol and other substance use

Alcohol and illicit drug use were the leading risk factors contributing to the burden of disease among young Australians in 2003—mainly through motor vehicle accidents, injury, substance dependence, overdose and suicide (AIHW 2007a; Begg et al. 2007). The 2007 National Drug Strategy Household Survey (NDSHS) indicated that 17% of young people were current smokers (with 13% smoking daily), with another 76% reporting they had never smoked. Most adult smokers begin during adolescence, and in 2007 the average age of starting was 15.8 years (2007 NDSHS unpublished data).

The 2007 NDSHS indicated that around two in five young Australians (37%) consumed alcohol at least once a month at levels considered to be risky or high risk in the short term; that is, on any one day, seven or more standard drinks for males and five or more standard drinks for females (NHMRC 2001).

In 2007, nearly a quarter of young people (23%) had used an illicit drug in the preceding 12 months. The most common types of illicit drugs used were marijuana/cannabis (18% of all young people), ecstasy (9%) and methamphetamine (including ice) (4%) (2007 NDSHS unpublished data).

In 2005–06, there were 8,013 hospitalisations among young people for mental and behavioural disorders due to drug and alcohol use (almost 2% of all hospitalisations among young people). In addition, there were 195 hospitalisations for accidental overdose of narcotics and hallucinogens, and 120 for accidental poisoning by alcohol (AIHW National Hospital Morbidity Database).

The Australian Secondary Students' Alcohol and Drug Survey has found that smoking prevalence among secondary students aged 12–17 years declined between 1999 and 2005 (AIHW 2007c). Over this period, the use of illicit substances also declined or remained stable, with steady decreases in the proportion of students ever using marijuana/cannabis, inhalants, tranquilisers, amphetamine, hallucinogens and opiates. Results from the 1999, 2000 and 2005 surveys showed a significant decrease in the proportion of 12–17 year olds who had consumed alcohol (ever, in the last month or in the last week).

Sun protection

Melanoma is the most serious type of skin cancer, and is the most common cancer diagnosed among young people. Sun exposure is a key risk factor for developing melanoma (AIHW 2007a). In 2003–04, the most commonly reported sun protection behaviours among 18–24 year olds were wearing sunglasses (52%), wearing headwear or long leg cover (37% each) and wearing 15+ sunscreen (36%) (Bowles et al. 2005). Based on self-reports from the 2004–05 NHS, almost half (49%) of young people aged 15–24 years regularly checked their skin for changes in freckles or moles, or had it checked by a doctor—a decrease from 55% in 2001 (AIHW 2006a). Young females were more likely than young males to have their skin checked—53% compared with 45% in 2004–05 (2004–05 NHS unpublished data).

Teenage pregnancy

Teenage pregnancies pose an increased risk to the health and socioeconomic conditions of both mothers and babies (AIHW 2007a). In 2006, 4% of all births in Australia were to females aged under 20 years (10,474 births). Fertility rates among young Australian females steadily declined over the two decades between 1986 and 2006—from 22 to 15 births per 1,000 females under 20 (ABS 2007a).

Fertility at younger ages continues to be much higher among Indigenous females. In 2006, the fertility rates among Indigenous females were 4 times as high as the national rates for those aged under 20 years (69 births per 1,000 females compared with 15).

6.4 People aged 25–64 years

The 25–64 years age group—often referred to as 'working-age adults'—constitutes just over half the total Australian population (54% in June 2006). Throughout the 40 years of life included in this age group, there are many changes that can occur for individuals. These may include marriage and parenthood, establishment in the workforce, changes in career paths, and, for many people, retirement. It is also the 'life stage' at which a wide variety of health conditions are likely to emerge. This is the group in which foundations for good or bad health in older years may become more set, especially in terms of health behaviours. Examining patterns in health and health behaviours for this group can therefore not only benefit the people concerned but also assist in predicting future health needs in the older population.

In Australia, people aged 25–64 years generally enjoy good health. However, as individuals progress through those years, their likelihood of maintaining good health diminishes because ageing itself is a risk factor for ill health. Health status varies within this age group. For example, as for other ages, working-age Aboriginal and Torres Strait Islander peoples and people from lower socioeconomic groups often have poorer health and shorter life expectancy than other population groups.

Health and functioning

Life expectancy

As for other age groups, life expectancy for those aged 25–64 years has increased over time and this trend is continuing. In the 10 years up to 2005, life expectancy improved by 3 years for males and 2 years for females (ABS 2006c). Females have higher life expectancy than males at all ages. At age 25, males in 2005 could expect to live until 79.5 years, and females until 84.0 years. At age 64, males could expect to live to age 82.9, and females to 86.2.

Self-assessed health status

Most Australians in the 25–64 years age group rate their health highly, but the proportions doing so decrease with age (Table 6.6). Estimates from the 2004–05 National Health Survey (NHS) show that almost two-thirds (64%) of 25–34 years olds rate their health as excellent or very good and this proportion declines to under half (47%) in the 55–64 years group. At all ages, higher proportions of females than males rate their health as excellent or very good.

Table 6.6: People aged 25–64 years who assessed their health as excellent or very good, 2004–05 (per cent)

	Age group			
Sex	**25–34**	**35–44**	**45–54**	**55–64**
Males	61.9	57.5	53.2	46.8
Females	65.8	66.1	56.1	47.6

Source: ABS 2006b.

Self-assessed health status declines as a person's number of long-term health conditions increases (Table 6.7). Only a third (32%) of people who reported five or more long-term conditions assessed their health as excellent or very good, compared with three quarters (74%) of those with no long-term conditions.

Table 6.7: Number of long-term health conditions reported by self assessed health status, people aged 25–64 years (per cent)

	Number of long-term health conditions					
Health status	**None**	**One**	**Two**	**Three**	**Four**	**Five or more**
Excellent/very good	74	70	65	57	51	32
Good	22	25	28	31	32	31
Fair/poor	4	5	8	12	17	37
Total	100	100	100	100	100	100

Note: Long-term health conditions are self-reported.

Source: AIHW analysis of the ABS 2004–05 NHS.

Long-term health conditions

In general, most people (nearly 90%) in the 25–64 years age group have at least one long-term health condition, and as people age their likelihood of developing more long-term conditions increases.

The long-term conditions they most commonly reported in the 2004–05 NHS are sight problems—mainly long- and short-sightedness (Table 6.8). The frequency of reporting certain conditions varies by age: for example, long-sightedness was rarely reported by those aged 25–34 years but was common in those aged 45 years and over. As Table 6.8 shows, in the younger age groups (under 45 years), asthma was commonly reported, whereas hypertensive disease and high cholesterol were not frequently reported until 45 years and over.

Table 6.8: Ten most commonly reported long-term health conditions, people aged 25–64 years, 2004–05 (per cent of each age group)

	Age group (years)				
Long-term condition	**25–34**	**35–44**	**45–54**	**55–64**	**Total**
Long-sightedness	. .	14.7	52.2	63.0	30.1
Short-sightedness	22.3	21.6	30.5	36.5	27.1
Back pain & disc problems[(a)]	15.3	21.6	22.5	26.1	21.0
Hayfever & allergic rhinitis	22.0	20.3	19.3	14.9	19.4
Arthritis (all types)	. .	10.0	20.0	38.6	15.6
Chronic sinusitis	11.3	11.6	12.3	12.3	11.8
Deafness	5.3	8.5	10.8	17.9	10.1
Hypertensive disease	. .	. .	13.6	26.4	8.8
Migraine	10.4	10.4	10.3	. .	8.3
Asthma	10.7	8.8	9.2	. .	7.7
Astigmatism	5.6	. .	. .	. .	. .
Presbyopia	. .	. .	. .	10.7	. .
Allergy	5.8	. .	. .	. .	. .
Mood affective problems	6.6	7.8	. .	. .	. .
High cholesterol	. .	. .	. .	17.6	. .

(a) Includes back problems not elsewhere classified.

. . These conditions are not applicable as they are not one of the ten most commonly reported conditions for that age group.

Note: Long-term conditions are self-reported.

Source: ABS 2006b.

Burden of disease

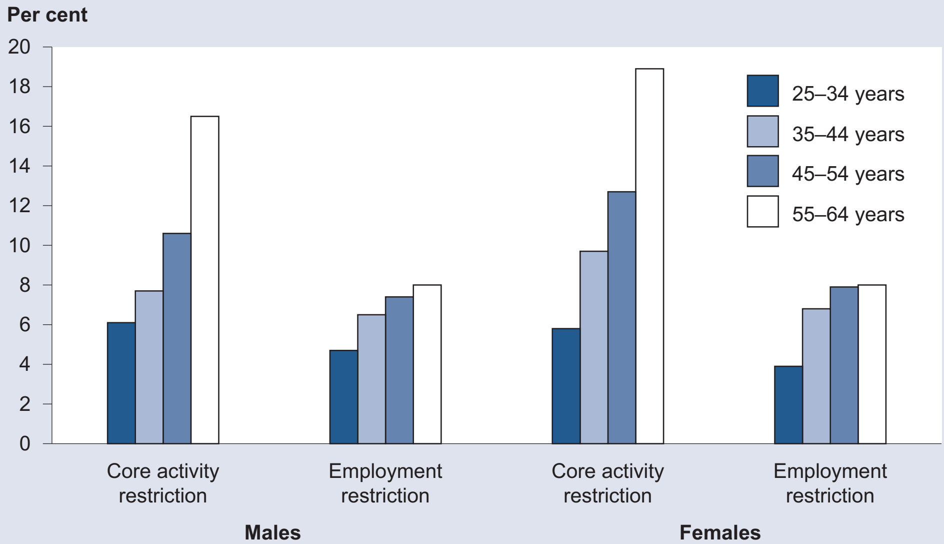
The impact of conditions causing illness, impairment, injury or premature death—known as the 'burden of disease'—has been estimated using a measure called the disability adjusted life year (DALY). For further information about DALYs, see Chapter 2.

The conditions that cause the most burden to those aged 25–64 years differ for males and females (Begg et al. 2007). For example, in 2003, coronary heart disease was the largest single contributor to disease burden for males (9.5% of all DALYs), whereas anxiety and depression was the largest contributor for females (15.7%).

Suicide and self-inflicted injuries (4.8%), road traffic accidents (2.9%), and alcohol dependence and harmful use (3.2%) were included in the top ten conditions for males but not for females. Breast cancer (8.0%), Type 2 diabetes (6.7%), lung cancer (2.9%), and personality disorders (2.3%) are included in the top ten for females.

Disability

Results from the ABS 2006 General Social Survey show that most people aged 25–64 years (85%) do not have disabilities that restrict them in their core activities or with their employment. Proportions of those who do have such restrictions increase with age and, generally, higher proportions of females than males report having core activity restrictions (Figure 6.9). In 2006, 6% of survey respondents aged 25–34 years reported restrictions with core activities and 4% with employment. These proportions increased for those aged 55–64 years—about 17% of the males and 19% of the females reported restrictions with core activities, and 8% of both males and females reported restrictions affecting their employment.



Notes

1. There are four levels of core activity limitation (profound, severe, moderate, and mild). For further information about how people were classified for the General Social Survey, readers should refer to the source of these data.
2. People are classified as having an employment restriction if they have any difficulties with employment because of their long-term health conditions.

Source: ABS 2007d.

Figure 6.9: Activity restrictions by age and sex, 2006

Work-related injury and absenteeism

Over 80% of Australians aged 25–64 years are employed, hence the term 'working-age Australians'. Illness and injury affect a person's ability to work, leading to productivity losses. Results from the 2004–05 NHS show that 8% of employed persons had days away from work because of an illness in the fortnight before the survey interview (ABS 2006b). This equated to almost 3 million days away from work because of personal illness within that period.

In 2004–05 there were over 140,600 new workers compensation claims for either a workplace injury or a disease or condition caused by the workplace (ASCC 2007). The great majority of these claims (85%) were for people aged 25–64 years and 64% were for males in that age group. The majority of these claims were for sprains and strains of joints and adjacent muscles (44%) and the most common bodily locations of injuries or diseases were the back (24%) and hands (12%).

Diseases of the musculoskeletal system are also commonly reported as a cause of work-related conditions. In the 2004–05 NHS, over 20% of respondents aged 25–64 years reported a long-term condition originally caused by their work. Back pain/problems and disc disorders were the most common work-related conditions (36%), followed by deafness (10%).

Use of health services

During 2006, there were 135 million Medicare services for Australians aged 25–64 years. This equates to 12.2 services per person in that age group. The most used services were general practitioner (GP) and specialist consultations (5.9 on average), and pathology services (4.3 on average). Service rates vary by sex and increase with age. Males and females aged 25–34 years had on average 5.6 and 13.5 services per year respectively, with the higher average rate among females relating mainly to obstetrics services. The Medicare service rate increased to 16.3 and 19.2 respectively for males and females aged 55–64 years.

In 2005–06, the problem most commonly managed at GP consultations in the age group was hypertension (high blood pressure) (Table 6.9).

Table 6.9: Problems most commonly managed at GP encounters, people aged 25–64 years, 2005–06

Males		Females	
Problem	**Per 100 encounters**	**Problem**	**Per 100 encounters**
Hypertension	9.4	Hypertension	7.1
Upper respiratory infection	5.3	Depression	5.8
Lipid (cholesterol) disorders	4.5	Female genital check up	5.1
Back complaints	4.5	Upper respiratory infection	4.8
Diabetes	4.1	Lipid (cholesterol) disorders	3.1

Source: Australian GP Statistics and Classification Centre analysis of BEACH data.

Consulting with health professionals other than doctors is common, with 12% of male and 18% of female respondents in the 25–64 years age group reporting doing so in the 2004–05 NHS. Of those consulting other health professionals, nearly one-third (30%) consulted chemists and about one-fifth consulted chiropractors (21%) or physiotherapists/hydrotherapists (19%).

Within the population aged 25–64 years, rates of hospitalisation vary by age group and sex (Table 6.10). Female rates are higher than male rates in all age groups until 54 years of age. This includes hospitalisations for pregnancy and childbirth, both of which are the dominant reasons for hospital admissions in females aged 25–34 years. However, in the 55–64 year age group, male hospitalisation rates are higher than those for females: 536 per 1,000 population in 2005–06 compared with 476.

Table 6.10: Hospitalisation[(a)] by age group and sex, people aged 25–64 years, 2005–06

	Age group			
Sex/measure	**25–34**	**35–44**	**45–54**	**55–64**
Males				
Total hospital separations	232,300	328,400	441,200	601,000
Number per 1,000 population	162	219	316	536
Females				
Total hospital separations	554,600	491,600	482,900	528,800
Number per 1,000 population	389	324	341	476

(a) All hospital separations, including same-day separations.

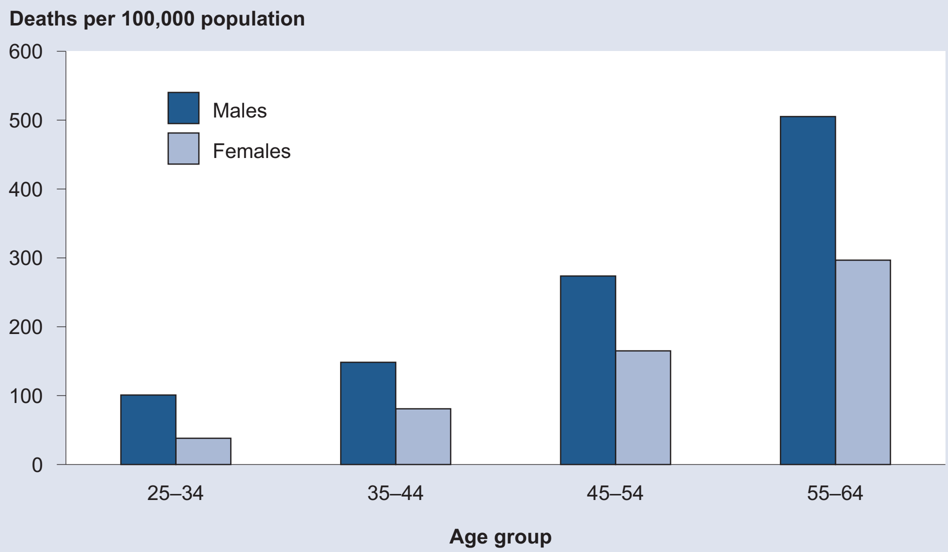
Source: AIHW 2007d.

The most common reason for hospitalisation for males aged 25–64 years was *Admit for renal dialysis*. For females, this was also the most frequently recorded reason with the exception of the 25–34 years age group, where the leading five reasons were obstetrics-related.

Mortality

With life expectancy at birth in 2003–2005 at 78.5 years for males and 83.3 years for females (ABS 2006c), deaths in those aged 25–64 years are considered premature. In 2005, 18% of all deaths were among those aged 25–64 years (23% of all male deaths and 14% of all female deaths).

Many more males than females die in this age group (Figure 6.10). In the younger age group (25–34 years), male deaths are more than twice as common as female deaths. This difference decreases with age but the male rate at age 55–64 years is still 70% higher than the female rate.



Source: AIHW National Mortality Database.

Figure 6.10: Mortality rates by age group, 2005

The most common specific causes of death in the 25–64 years age group differ by sex (Table 6.11)—for males, it is coronary heart disease (15.7%) and for females, breast cancer (14.5%). However, these leading causes are not representative of the younger ages within the group. For both males and females in the 25–34 years age group, external causes such as intentional self-harm (suicide), land transport accidents and accidental poisonings feature strongly. With increasing age, chronic diseases emerge. In the oldest group (55–64 years), the top four causes of death for both males and females are heart disease and types of cancer.

Table 6.11: Five leading causes of death by age group, 2005 (per cent of age group)

	Age group (years)				
Cause of death	25–34	35–44	45–54	55–64	Total 25–64 years
			Males		
Coronary heart disease	2.9	11.4	18.0	18.2	15.7
Intentional self-harm	24.9	16.8	7.7	. .	7.9
Lung cancer	. .	. .	5.8	11.5	7.5
Land transport accidents	17.9	7.4	. .	. .	4.2
Colorectal cancer	. .	. .	4.4	5.5	4.2
Other heart disease	2.7	. .	. .	3.8	. .
Unknown primary site cancers	. .	. .	. .	3.8	. .
Cirrhosis and other disease of the liver	. .	4.8	5.5	. .	. .
Accidental poisoning	11.1	6.5	. .	. .	. .
			Females		
Breast cancer	5.5	15.1	18.4	13.3	14.5
Lung cancer	. .	. .	7.5	11.2	8.2
Coronary heart disease	. .	4.9	6.0	7.6	6.5
Colorectal cancer	. .	. .	4.9	5.0	4.5
Cerebrovascular disease	. .	4.7	3.8	. .	3.6
Chronic obstructive pulmonary disease	. .	. .	. .	3.8	. .
Intentional self-harm	14.4	7.7	. .	. .	. .
Land transport accidents	11.2	. .	. .	. .	. .
Accidental poisoning	7.7	4.9	. .	. .	. .
Other heart disease	4.4	. .	. .	. .	. .

. . Not applicable because the cause of death is not one of the five most commonly causes of death for that age group.

Source: AIHW National Mortality Database.

Although this age group largely consists of people who are in the workforce, there are relatively few work-related deaths each year. Preliminary data for 2004–05 show that there were 214 compensated fatality claims related to work, about 74% of which were for people aged 25–64 years (ASCC 2007). The majority of these deaths were of males and the highest number of fatalities occurred in the transport and storage industry.

Health risk and protective factors

There are many factors that can either raise or lower the risk of ill health for individuals, both in the short- and longer term. These are discussed in detail in Chapter 4 of this report. This section provides information about the prevalence of a number of well-known health risk and protective factors among the working-age population.

Health risk and protective factors vary across the 25–64 years age group by sex (Table 6.12). In 2004–05, levels of excess body weight for this group were high. Almost two-thirds (64%) of males in this group were overweight or obese and for females this proportion was 42%. One quarter (25%) were current smokers. Alcohol intake at risky or high-risk levels was relatively uncommon, but still a concern—in the 2004–05 NHS, 17% of males and 13% of females reported consuming alcohol at levels that are considered risky to health.

Dietary patterns are also of concern: less than 15% in this group eat the recommended daily serves of vegetables. Fruit consumption estimates are more positive, with 46% of males and 60% of females eating the recommended two or more serves per day. The majority of people in the age group (67.5%) undertook some form of exercise for sport, recreation or fitness in the 2 week period before the survey, and one-third reported exercising at low levels or being sedentary.

Table 6.12: Selected health risk and protective factors, people aged 25–64 years, 2004–05 (per cent)

Risk and protective factor	Males	Females	Total
Current smokers[(a)]	28.4	22.5	25.4
Risky or high risk alcohol consumption[(b)]	16.8	12.5	14.7
Sedentary exercise[(c)]	33.6	31.5	32.5
Overweight or obese[(d)]	64.2	42.2	53.1
Usually eats less than the recommended daily fruit intake[(e)]	53.6	40.4	47.0
Usually eats less than the recommended daily vegetable intake[(f)]	88.0	82.9	85.4
High blood pressure	11.0	10.2	10.6
High blood cholesterol	7.8	6.6	7.2

(a) Daily or other current smokers.

(b) In a 1-week period.

(c) Physical activity for sport, recreation or exercise only; does not include those who exercised for transport or for work.

(d) Body mass index greater than or equal to 25.

(e) Dietary guidelines recommend at least two serves of fruit per day.

(f) Dietary guidelines recommend at least five serves of vegetables per day.

Source: AIHW analysis of the 2004–05 NHS.

Risk factors—such as smoking, risky consumption of alcohol and high blood cholesterol—can help initiate chronic illnesses, speed up their progression, or impede recovery or quality of life. The risk of developing illness increases with the number of risk factors. From the 2004–05 NHS, most people aged 25–64 years had at least one risk factor (99% of males and 96% of females) and large proportions had three or four (58% of males and 42% of females). Of the 85% of adults aged 25–64 years who did not eat the recommended number of serves of vegetables, 61% also exercised at low levels or were sedentary, 45% were overweight or obese, and 43% ate fewer than the recommended serves of fruit.

6.5 Older people

Good health is a crucial factor in older Australians being able to enjoy a good quality of life, stay independent and participate fully in the community. Good health among older Australians also helps to moderate demand for health and aged care services, which is important as Australia's population ages over coming decades. In response to population ageing, Australia has made improving older people's health a national research priority. One area of special interest is the adoption of a healthy lifestyle at older ages because its benefits include the prevention of disease and functional decline, extended longevity and enhanced quality of life (WHO 2002).

The evidence shows that today's older Australians are living longer and, in several respects, healthier lives than previous generations. This section documents some of that evidence and examines the health conditions and diseases that have the biggest impact on older Australians. A focus on hospital use among older Australians is also presented.

Older Australians, defined in this section as people aged 65 years and over, make up a little over one in eight Australians, about 13% of the population (2,687,000 people at 30 June 2006) (ABS 2007e).

Health status

Life expectancy

At age 65, Australia's males can now expect to live to be 83.1 years and females to be 86.4 years, which is about 6 years more than their counterparts at the beginning of the 20th century (ABS 2006c). Males and females aged 85 years can expect to live for a further 5.9 and 7.1 years respectively, which is about 2 years more than for the early 1900s. Most of these gains in life expectancy among older Australians occurred during the latter three decades of the 20th century, when mortality from cardiovascular diseases (notably heart disease and stroke) fell rapidly.

Even though age-specific prevalence rates of disability appear relatively stable in Australia, the ageing of the population and the greater longevity of individuals are leading to growing numbers of people, especially at older ages, with a disability and a severe or profound core activity limitation.

Indeed, the evidence for Australia suggests that most of the recent gain in life expectancy for individuals was spent with disability in those last extra years, much of the period with a profound or severe core activity limitation (AIHW 2006b). A recent analysis of Australian data over the 15-year period from 1988 to 2003 showed that a male's life expectancy at age 65 increased by 1.5 years over this period (AIHW 2006b). Of this gain, one extra year of life was spent with disability (67% of the gain), including 27% of the gain being spent with profound or severe core activity limitation. Older females increased their life expectancy at age 65 by 1.2 years; over 90% of the gain was estimated to be time spent with disability, including 58% of the gain being spent with profound or severe limitation.

These patterns in life expectancy and disability have important consequences for the number of Australians reaching older ages and for patterns of health, disease and disability in the community.

Self-assessed health status

According to the 2004–05 NHS, the majority of older Australians consider themselves to be in excellent, very good or good health, although the proportion reporting fair or poor health increases with age (Table 6.13). Thus, many older people have a positive view of their health even though older age may be generally associated with increasing levels of disability and illness. Over the latest 10 years there has been a general increase in the proportion of older Australians reporting their health as excellent or very good (ABS 2006b). At the same time, older females have been consistently more likely than older males to rate their health as excellent or very good.

Table 6.13: Self-assessed health status of Australians aged 65 years and over, by age and sex, 2006

Health status[(a)]	65–74	75–84	85 and over	65 and over
Males				
Excellent/very good	36.3	28.2	*24.4	32.7
Good	34.8	34.4	*37.5	34.8
Fair/poor	28.9	37.4	38.1	32.5
Total	**100.0**	**100.0**	**100.0**	**100.0**
Females				
Excellent/very good	40.1	31.0	20.5	34.7
Good	35.4	30.3	37.2	33.7
Fair/poor	24.5	38.8	42.3	31.7
Total	**100.0**	**100.0**	**100.0**	**100.0**
Persons				
Excellent/very good	38.2	29.8	21.9	33.8
Good	35.1	32.1	37.3	34.2
Fair/poor	26.6	38.2	40.8	32.0
Total	**100.0**	**100.0**	**100.0**	**100.0**

* Estimate has a standard error of 25% to 50% and should be used with caution.

(a) The person's general assessment of his or her own health against a five-point scale ranging from excellent through to poor.

Note: Components may not add to total because of rounding.

Source: ABS 2007d.

Causes of death and disability

The top 12 specific causes of death were responsible for almost 70% of all deaths among older Australians in 2005 (Table 6.14).

Coronary heart disease and cerebrovascular disease (notably stroke) were the two leading causes of death, accounting for about 30% of all deaths among older males and females in 2005. These diseases are also major causes of disability among older Australians. Other heart diseases, which include heart failure, also featured prominently.

Lung cancer was the third most common cause of death for older males and the fifth for older females. Colorectal cancer was also prominent for both sexes, and prostate cancer and breast cancer were two prominent sex-specific causes of death. Cancers where the primary site was unknown were ranked in the top 12 causes of death for both older males and females.

Chronic pulmonary obstructive disease, which includes emphysema, was a significant cause of death for older males and females (ranked sixth for both), responsible for just over 4% of all deaths among older Australians.

Table 6.14: Leading causes of death in Australians aged 65 and over, by sex, Australia, 2005

Males	Deaths	Per cent of total	Females	Deaths	Per cent of total
Coronary heart disease	10,016	20.1	Coronary heart disease	10,565	19.7
Cerebrovascular disease	4,226	8.5	Cerebrovascular disease	6,527	12.2
Lung cancer	3,542	7.1	Other heart diseases	4,050	7.6
Prostate cancer	2,752	5.5	Dementia & related disorders	3,234	6.0
Other heart diseases	2,625	5.3	Lung cancer	1,990	3.7
Chronic obstructive pulmonary disease	2,589	5.2	Chronic obstructive pulmonary disease	1,839	3.4
Colorectal cancer	1,687	3.4	Influenza & pneumonia	1,615	3.0
Diabetes	1,462	2.9	Diabetes	1,594	3.0
Dementia & related disorders	1,445	2.9	Breast cancer	1,450	2.7
Cancers (unknown primary site)	1,353	2.5	Colorectal cancer	1,448	2.7
Influenza & pneumonia	1,227	2.6	Cancers (unknown primary site)	1,294	2.4
Diseases of arteries etc.	1,090	2.2	Diseases of arteries etc.	1,110	2.1
Total (12 leading causes)	34,014	68.1	Total (12 leading causes)	36,716	68.5
Total (All deaths 65+)	49,920	100.0	Total (All deaths 65+)	53,566	100.0

Source: AIHW National Mortality Database.

Although the 'burden of disease' caused by dementia is due mainly to disability rather than to premature death, dementia and related disorders, which include Alzheimer's disease, still cause many deaths among older Australians (ranked ninth for males and fourth for females).

Diabetes was the underlying (primary) cause of over 3,000 deaths and was ranked the eighth leading cause for both older males and females. It is more commonly listed as an associated (contributory) cause of death, especially when coronary heart disease, cancer and stroke are the underlying causes. It is also associated with disability and poor quality of life.

Diseases of the arteries, which include aortic aneurysm, atherosclerosis and other peripheral vascular diseases, were the twelfth leading cause of death for older males and females.

The top 12 causes of death show important differences for each of the age groups 65–74 years, 75–84 years and 85 years and over (AIHW 2007e). For example, the top causes of death for 65–74 year olds include pancreatic cancer, cirrhosis of the liver (males) and ovarian cancer (females). At 75–84 years, deaths from dementia and related disorders become relatively more important, and influenza and pneumonia appear in the top causes of death for the first time. For those aged 85 years and over, influenza and pneumonia become relatively more important and kidney failure appears among the top causes.

When the effect of disability is taken into account, the other conditions with a large impact on older Australians include adult-onset hearing loss, Parkinson's disease (males), osteoarthritis (females) and falls (females) (Begg et al. 2007).

Use of health services

In 2004–05, there were 2.5 million separations from Australian hospitals for people aged 65 years and over, representing 35% of all separations (see Box 7.9 for more information about terms and data sources relating to hospital use). Although overall rates of hospital bed use among the Australian population have remained reasonably stable among younger people since the early 1990s, these rates have declined among the population aged 65 and over, reflecting interactions between growth in the older population and the relative increase in same-day (versus overnight) hospital separations (Gray et al. 2004). However, at the same time, older people have grown as a proportion of the population. The effect of these trends is that the share of hospital patient days used by older people has remained stable (AIHW: Karmel et al. 2007).

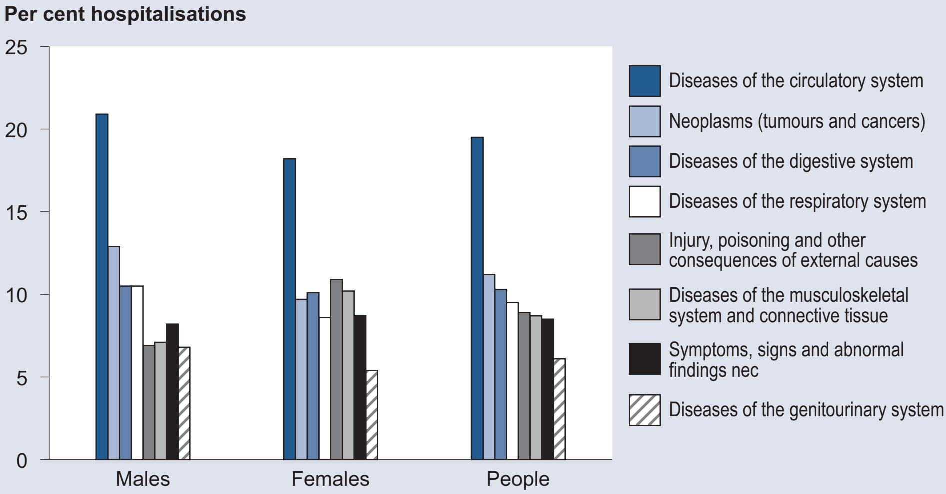
Nevertheless, older people are still much higher users of hospitals than their younger counterparts, making up 53% (29,000) of people in hospital on the night of 30 June 2004 and accounting for 37% of hospitalisations lasting at least one night during 2004–05 (AIHW: Karmel et al. 2007). Age-specific rates of separation increase for each age group within the population aged 65 years and over, as does average length of stay (AIHW 2007e).

Older males have higher rates of hospital use than older females—with separation rates of 475 overnight hospital episodes per 1,000 older males compared with 414 for older females (AIHW: Karmel et al. 2007). However, because older females make up a larger proportion of the older population, they constituted over half (55%) of the older people in hospital on 30 June 2004.

Consistent with the information about major causes of death, the most common principal diagnoses for older Australians admitted to hospital in 2004–05 were diseases of the circulatory system (accounting for one-fifth of overnight hospitalisations for older males and females) and cancers and tumours (11%) (Figure 6.11; AIHW: Karmel et al. 2007). Other common principal diagnoses were respiratory and digestive diseases (both around 10% of hospital separations), injury or poisoning (9%), musculoskeletal diseases (9%) and diseases included in the category *Symptoms, signs and abnormal findings not elsewhere classified* (9%).

On discharge from hospital, older people are less likely than younger people to return to their usual residence, and more likely to enter residential aged care or die. In particular, a relatively high proportion of injury-related hospitalisations for older people are followed by discharge to a residential aged care or 'other health facility' (AIHW: Karmel et al. 2007).

The interface between acute hospital care and residential aged care has long been recognised as an important issue in aged care services policy and research (Duckett 2002; Renwick et al. 1992). The analysis of movements of older people between these two sectors of the health-care system has recently become possible with the development of a data linkage method using administrative by-product data for hospital separations and residential aged care admissions (Karmel & Gibson 2007; AIHW: Karmel & Rosman 2007; AIHW: Karmel et al. 2008).



Source: AIHW: Karmel et al. 2007.

Figure 6.11: Top eight principal condition groups for overnight hospitalisations among people aged 65 years and over, 2004–05

Although, from the perspective of the hospital sector, a relatively small proportion of separations among older people involve transfers to residential aged care, a substantial proportion of residential aged care admissions come from hospital. (In addition, many aged care residents have periods in hospital.) During 2001–02, across six selected jurisdictions, there were over 620,000 separations from hospital for stays lasting at least one night for people aged 65 years and over (Table 6.15). Of these hospital separations, about one in ten (61,700) involved transferring into residential aged care, either as returns (6% of all separations) or as new admissions (3% to permanent and 1% to respite residential age care).

In contrast, across the six jurisdictions there were 67,348 residential aged care admissions during 2001–02, of which nearly one-third were from hospital (23% into permanent and 10% into respite residential aged care) (Table 6.15). From the perspective of the residential aged care sector, this means that more older people made the transition to aged care facilities on a permanent basis via hospitals (15,600 out of 38,511, or 41% of all permanent admissions) than from the community (9,200 out of 38,511, or 24% of all permanent admissions). The remaining permanent admissions (13,730) related to transfers between residential aged care facilities. Quite a different pattern was seen for respite admissions, with admissions from the community accounting for more than three times as many respite admissions as those from hospital (21,000 compared with 6,800). Transfers into respite care from other residential aged care facilities were a relatively small group (1,007 admissions).

Table 6.15: Movement types for hospital separations and residential aged care (RAC) admissions, people aged 65 or more, 2001–02 (six jurisdictions)

Type of movement	Number	Per cent
Hospital separations		
Return to permanent RAC[(a) (b)]	39,200	6.3
To permanent RAC[(a) (b) (c)]	15,700	2.5
To respite RAC[(b) (c)]	6,800	1.1
All to RAC	*61,700*	*9.9*
To community/other[(d)]	528,900	85.3
Died in hospital[(d)]	29,755	4.8
All	620,372	100.0
RAC admissions		
From hospital to permanent RAC[(a) (b) (c)]	15,600	23.2
From hospital to respite RAC[(a) (b) (c)]	6,800	10.1
Transfer into permanent RAC[(e)]	13,730	20.4
Transfer into respite RAC[(e)]	1,007	1.5
From community into permanent RAC[(e)]	9,200	13.6
From community into respite RAC[(e)]	21,000	31.2
Total into permanent RAC	*38,511*	*57.2*
Total into respite RAC	*28,837*	*42.9*
All	**67,348**	**100.0**

(a) Links to a permanent admission on the same or next day as the end of a period of hospital leave for the same person have been reassigned as linking to the hospital leave. This affected 102 links to permanent admissions.

(b) Based on linked hospital and RAC records. Same-day and next-day re-admissions into permanent RAC are treated as transfers and so have been combined into a single period of care when identifying returns to RAC after hospital leave. Links to RAC hospital and social leave are both classified as returns to RAC.

(c) Estimates between hospital and RAC vary slightly depending on whether movements from hospital or into RAC are being examined because of transitions occurring across either the beginning or end of the financial year or at different ages.

(d) Unlinked hospital separations. Deaths are based on reported hospital mode of separation.

(e) Unlinked RAC admissions (includes people changing RAC facility on return from hospital).

Notes

1. Age is as at time of hospital admission or RAC admission.
2. Table excludes same-day hospital episodes, statistical discharges and transfers to other hospitals.
3. Table includes all states/territories except Victoria and Western Australia.
4. The numbers for live discharges from hospital and non-transfer admissions into RAC have been adjusted to allow for underidentification of transitions into RAC and so are rounded to the nearest hundred. Numbers not affected by these adjustments are not rounded. Percentages are based on the unrounded numbers.

Source: AIHW: Karmel et al. 2008.

References

Australia and New Zealand Food Regulation Ministerial Council. Joint communiqué Food Ministers Protect Public Health 2007. Viewed 10 April 2008 at <www.health.gov.au>.

ABS (Australian Bureau of Statistics) 2002. 2001 National health survey: summary of results. ABS cat. no. 4715.0. Canberra: ABS.

ABS 2003. Breastfeeding in Australia, 2001. ABS cat. no. 4810.0.55.001. Canberra: ABS.

ABS 2004. Disability, ageing and carers: summary of findings, 2003. ABS cat. no. 4433.0. Canberra: ABS.

ABS 2006a. Births Australia, 2005. ABS cat. no. 3301.0. Canberra: ABS.

ABS 2006b. National Health Survey 2004–05. ABS cat. no. 4364.0. Canberra: ABS.

ABS 2006c. Deaths, Australia, 2005. ABS cat. no. 3302.0. Canberra: ABS.

ABS 2007a. Births, Australia 2006. ABS cat. no. 3301.0. Canberra: ABS.

ABS 2007b. Causes of death Australia, 2005. ABS cat. no. 3303.0. Canberra: ABS.

ABS 2007c. 2006 Census tables: age by Indigenous status by sex, Australia. ABS cat. no. 2068.0. Canberra: ABS.

ABS 2007d. General Social Survey: summary results, 2006. ABS cat. no. 4159.0. Canberra: ABS.

ABS 2007e. Australian demographic statistics, March quarter 2007. ABS cat. no. 3101.0. Canberra: ABS.

ABS & AIHW (Australian Institute of Health and Welfare) 2005. The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples, 2005. ABS Cat. no. 4704.0; AIHW Cat. no. IHW 14. Canberra: ABS.

ABS & AIHW 2008. The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples, 2008. ABS cat. no 4704.0; AIHW cat. no. IHW 21. Canberra: ABS & AIHW.

AIHW (Australian Institute of Health and Welfare) 2005. A picture of Australia's children. Cat. no. PHE 58. Canberra: AIHW.

AIHW 2006a. Australia's health 2006. Cat. no. AUS 73. Canberra: AIHW.

AIHW 2006b. Life expectancy and disability in Australia 1988 to 2003. Cat. no. DIS 47. Canberra: AIHW.

AIHW 2007a. Young Australians: their health and wellbeing 2007. Cat. no. PHE 87. Canberra: AIHW.

AIHW 2007b. Profile of nutritional status of children and adolescents. Cat. no. PHE 89. Canberra: AIHW.

AIHW 2007c. Statistics on drug use in Australia 2006. Drug statistics series no. 18. Cat. no. PHE 80. Canberra: AIHW.

AIHW 2007d. Australian hospital statistics 2005–06. Cat. no. HSE 50. Canberra: AIHW.

AIHW 2007e. Older Australia at a glance. Cat. no. AGE 52. Canberra: AIHW.

AIHW: Catanzariti L, Faulks K & Waters A-M 2007. National diabetes register: statistical profile 1999–2005. Cat. no. CVD 39. Canberra: AIHW.

AIHW: Karmel R, Lloyd J & Hales C 2007. Older Australians in hospital. Bulletin no. 53. Cat. no. AUS 92. Canberra: AIHW.

AIHW: Karmel R, Lloyd J & Anderson P 2008. Movement from hospital to residential aged care: preliminary results. Canberra: AIHW.

AIHW: Karmel R & Rosman D 2007. Comparing name-based and event-based strategies for data linkage: a study linking hospital and residential aged care data for Western Australia. Data linkage series no. 3. Cat. no. CSI 3. Canberra: AIHW.

ASCC (Australian Safety and Compensation Council) 2007. Viewed 12 September 2007 at <www.ascc.gov.au>.

Begg S, Vos T, Barker B, Stevenson C, Stanley L & Lopez A 2007. The burden of disease and injury in Australia, 2003. Cat. no. PHE 82. Canberra: AIHW.

Booth M, Okely AD, Denney-Wilson E, Hardy L, Yang B & Dobbins T 2006. NSW Schools Physical Activity and Nutrition Survey (SPANS) 2004: full report. Sydney: NSW Department of Health.

Bowles KA , Dobbinson S & Wakefield M 2005. Sun protection and sunburn incidence of Australian adults: summer 2003–04. A report prepared for the Commonwealth Cancer Strategies Group and The Cancer Council Australia in consultation with a national collaborative research group. Melbourne: Cancer Council Victoria.

Carter KD & Stewart JF 2003. National Dental Telephone Interview Survey 2002. Cat. no. DEN 128. Adelaide: AIHW Dental Statistics and Research Unit.

DoHA (Australian Government Department of Health and Ageing) 2005. National sexually transmissible infections strategy, 2005–2008. Canberra: DoHA.

DoHA & NHMRC (National Health and Medical Research Council) 2005. Food for health: dietary guidelines for Australians. Viewed 19 November 2007, <http://www.nhmrc.gov.au/publications/synopses/_files/n31.pdf>.

Duckett SJ 2002. Aged care symposium: overview. Australian Health Review 25:130–1.

Gray L, Yeo M & Duckett S 2004. Trends in the use of hospital beds by older people in Australia: 1993–2002. Medical Journal of Australia 181:478–81.

IDF (International Diabetes Federation) 2006. Diabetes atlas, 3rd edition. Belgium: IDF.

Karmel R & Gibson D 2007. Event-based linkage in health and aged care services data: a methodological innovation. BMC Health Services Research 7:154.

Laws PJ, Abeywardana S, Walker J & Sullivan EA 2007. Australia's mothers and babies 2005. Cat. no. PER 40. Sydney: AIHW National Perinatal Statistics Unit.

Laws PJ & Sullivan EA 2004. Australia's mothers and babies 2001. Cat. no. PER 25. Sydney: AIHW National Perinatal Statistics Unit.

Medicare Australia 2007. Australian Childhood Immunisation Register statistics. Viewed 28 May 2007, <www.medicareaustralia.gov.au>.

National Notifiable Diseases Surveillance System 2007. Viewed 15 February 2008 at <www9.health.gov.au.>

NHMRC (National Health and Medical Research Council) 2001. Australian alcohol guidelines: health risks and benefits. Canberra: NHMRC.

NHMRC 2003. Dietary guidelines for children and adolescents in Australia incorporating the infant feeding guidelines for health workers. Canberra: NHMRC.

OECD (Organisation for Economic Co-operation and Development) 2007. OECD health data 2007: Infant mortality rate. Viewed 7 August 2007 at <www.oecd.org>.

Patton GC, Goldfeld SR, Pieris-Caldwell I, Bryant M & Vimpani G 2005. A picture of Australia's children. Editorial. Medical Journal of Australia 182(9):437–8.

Prior M, Sanson A, Smart D & Oberklaid F 2000. Infancy to adolescence: Australian temperament project 1983–2000. Melbourne: Australian Institute of Family Studies.

Renwick M, Gillett S & Liu Z 1992. Long stay older patients in acute hospitals: are they bed blockers. Australian Health Review 15:248–98.

Sullivan E & Hall B 2007. Maternal deaths in Australia 2003–2005. Maternal deaths series no. 3. Cat. no. PER 42. Sydney: AIHW National Perinatal Statistics Unit.

WHO (World Health Organization) 1992. International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, 1992 (ICD-10). Geneva: WHO.

WHO 2002. Active ageing: a policy framework. Geneva: WHO.

WHO 2004. Maternal mortality in 2000: Estimates developed by WHO, UNICEF and UNFPA. Geneva: WHO.

Zubrick SR, Williams AA, Silburn SR & Vimpani G 2000. Indicators of social and family functioning. Canberra: Commonwealth Department of Family and Community Services.

7 Health services

Key points

- About 85% of Australians visit a doctor at least once a year.
- GPs are doing increasing work on conditions such as diabetes, hypertension and oesophageal disease, and less on upper respiratory tract infections and asthma.
- Ambulances attended over 2.7 million incidents in Australia in 2006–07, of which 39% were emergency incidents and 28% were urgent.
- In 2005–06, there were about 7.3 million hospital separations a 37% increase since 1996–97, 55% of them being same-day compared to 45% in 1996–97.
- On a typical day, there were 20,000 hospital separations, and 124,000 non-admitted hospital services provided in settings such as emergency departments and outpatient clinics.
- For the year 2005–06, over 9% of hospital separations were considered potentially preventable and rates for potentially preventable separations were higher for people living in more remote or disadvantaged areas.
- In 2006–07, about one in nine of all prescriptions under the PBS/RPBS were for a mental health-related medication.

This chapter presents an overview of Australia's health services. The provision of health services by health professionals and other health service workers, and the delivery of health-care goods such as pharmaceuticals, account for the vast majority of expenditure described in the next chapter.

In this chapter, health services are grouped into the broad categories of public health services, primary care and community health services, hospital services and specialised health services (Figure 7.1). However, although these groupings are useful as a way to organise the information in this chapter, they cannot fully convey how health services are organised in Australia, the complex and changing patterns of health service delivery, or the similarly complex paths that some patients follow through the health sector. In addition, some types of service can belong to more than one category. For example, dental services are in the primary care and community health care category, but can also be included in the specialised health services category.

Sections on each of these broad categories are presented in turn in this chapter, and statistics relating to the National Health Performance Committee indicators (see chapters 1 and 9) are included where appropriate. The chapter also includes information on the use of medicines and on medical indemnity claims.

Public health services	Primary care and community health care services	Hospitals	Specialised health services
Cancer screening	General practitioner	Admitted patient care	Specialist medical practitioner
Immunisation	Primary health care for Aboriginal and Torres Strait Islander peoples	Emergency department	Specialised mental health
	Dental	Outpatient care and other non-admitted care	Sexual and reproductive health
	Allied health		Alcohol and other drug treatment
	Community health		National Diabetes Service Scheme
	Ambulance and Royal Flying Doctor Service		Hearing
	Complementary and alternative health		Palliative care
			Health services in the Australian Defence Force

Figure 7.1: Health service categories used to structure this chapter

Box 7.1: How dates and time spans are presented here

Dates and time spans shown in this chapter and elsewhere in this book can be confusing. Please note:

- Periods based on full calendar years (1 January to 31 December) are written as, for example, 2001 for one year, then with the final year written in full if there is more than one year. For example, 2001–2002 is a two calendar-year span and 2001–2003 covers three calendar years.
- Periods based on financial years (1 July to 30 June, as with hospital statistics) are written with a second number which is abbreviated: for example, 2001–02 for one year, 2001–03 for two and 2001–04 for three. A longer span of financial years is written as 'In the 10-year period from 1997–98 to 2006–07…'
- Some surveys may be based on other 12-month spans—for example, the general practice BEACH survey is based on collection periods from 1 April to 31 March. These are presented as for financial years; for example, 2001–02 would be a 'year'.

7.1 Public health services

What is public health?

A widely used definition of public health in Australia is 'the organised response by society to protect and promote health, and to prevent illness, injury and disability; the starting point for identifying public health issues, problems and priorities, and for designing and implementing interventions, is the population as a whole, or population subgroups' (NPHP 1998). The term 'public health' is often used interchangeably with 'population health' and 'preventive health'.

In essence, public health interventions focus on prevention, promotion and protection rather than on treatment; on populations rather than on individuals; and on the factors and behaviours that cause illness. Using a range of sources, the AIHW has estimated that around $1.5 billion was spent by governments on public health activities in Australia in 2005–06, representing 1.8% of total health expenditure.

Public health activities can take the form of programs, campaigns, or events. They draw on a very large range of methods such as health education, lifestyle advice, infection control, risk factor monitoring, and tax loadings to discourage unhealthy lifestyle choices. They also apply in multiple settings (such as schools, homes, workplaces, through the media, and via general practitioner consultations), and relate to a broad spectrum of health issues. They are variously carried out by state, territory and local governments, the Australian Government, and other agencies such as anti-cancer councils and the Heart Foundation.

This section features cancer screening services (one of the more 'visible' sets of public health services) and immunisation services delivery. Information on public health expenditure is included in Chapter 8.

Cancer screening

For breast, cervical and bowel cancers, there are national population screening programs in Australia. Their goals are to reduce morbidity and mortality from these cancers through early-as-possible detection of cancer and pre-cancerous abnormalities and effective follow-up treatment. These programs are called BreastScreen Australia (using mammography for screening), the National Cervical Screening Program (using Pap tests) and the National Bowel Cancer Screening Program (using faecal occult blood tests). They provide screening services that are free to females in the target age group (for breast screening) and to males and females invited to participate in bowel screening, or they are covered by a Medicare rebate (for cervical screening).

BreastScreen Australia

The BreastScreen Australia program began in 1991 (Box 7.2). The proportion of females in the target age group 50–69 years who were screened under the BreastScreen Australia program in a 2-year period rose from 51.4% in 1996–1997 (the first period for which national data are available) to 56.9% in 2000–2001, before falling to 56.2% in 2004–2005 (Table 7.1).

Box 7.2: BreastScreen Australia

The BreastScreen Australia program is jointly funded by the Australian Government and state and territory governments. It aims at reducing mortality and morbidity from breast cancer by actively recruiting and screening females without symptoms in the target age group 50–69 years. The program comprises a network of dedicated screening and assessment services throughout metropolitan, rural and remote areas of all Australian states and territories. Services are available through both fixed and mobile centres. They provide free 2-yearly mammographic screening and follow-up of any suspicious breast areas identified at screening, to the point of either diagnosis of breast cancer or confirmation of the absence of the cancer. As well as those from the target age group, females aged 40–49 years and 70 years and over may use the screening service. Attendance at the service does not require a doctor's referral.

The program has performance objectives in the National Accreditation Standards agreed on by the Department of Health and Ageing and BreastScreen Australia state and territory programs for individual screening services. These objectives include 70% overall participation by females in the target age group 50–69 years for each 2-year screening interval; and rescreening rates of 75% after first screening and 90% after subsequent screening rounds.

Table 7.1: Participation of females aged 50–69 years in BreastScreen Australia, 1996–1997 to 2004–2005

Years of screening	Target population	Participation rate (%)
1996–1997	844,626	51.4
1998–1999	975,511	55.7
2000–2001	1,063,585	56.9
2002–2003	1,118,146	56.2
2004–2005	1,188,720	56.2

Note: Rates are the number of females screened as a percentage of the eligible female population calculated as the average of the Australian Bureau of Statistics estimated resident population and age-standardised to the Australian population at 30 June 2001.

Source: AIHW analysis of BreastScreen Australia data.

Table 7.2 shows the rescreen rates for 2002 and 2003 for females aged 50–67 years. Although the BreastScreen Australia target age group is 50–69 years, only data on females aged 50–67 years are reported for the rescreen indicator. This is because females aged 68–69 years in the index year were outside the target age group 27 months after their index screen.

The objectives of rescreening at least 75% of females in the age group 50–67 attending for their first screening round and at least 90% of females attending for their second or subsequent screening rounds were not achieved in 2002 and 2003. The age-standardised rescreen rate for females aged 50–67 years attending for their first screening round declined from 61.6% in 2002 to 60.5% in 2003, but this decline was not statistically significant. The rescreen rates for females aged 50–67 years participating in their second or subsequent rounds were higher than those achieved by females participating in their first screening round, but they did not reach the objective of at least 90%.

Table 7.2: BreastScreen Australia rescreening rates for females aged 50–67 years, screened during 2002 and 2003

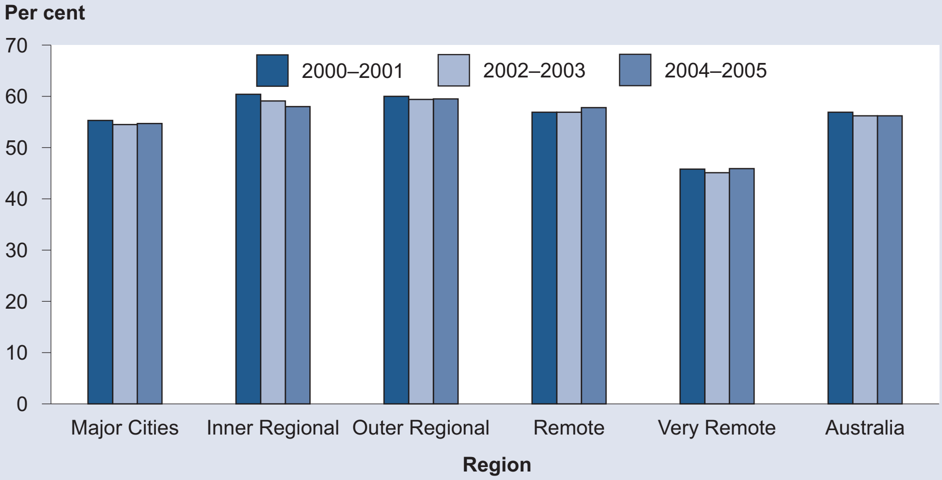
	Objective[(a)]	2002	2003
First screening round			
Rate (%) for females aged 50–67 years	≥ 75	61.6	60.5
Second screening round			
Rate (%) for females aged 50–67 years	≥ 90	70.3	69.5
Subsequent screening rounds			
Rate (%) for females aged 50–67 years	≥ 90	80.7	80.1

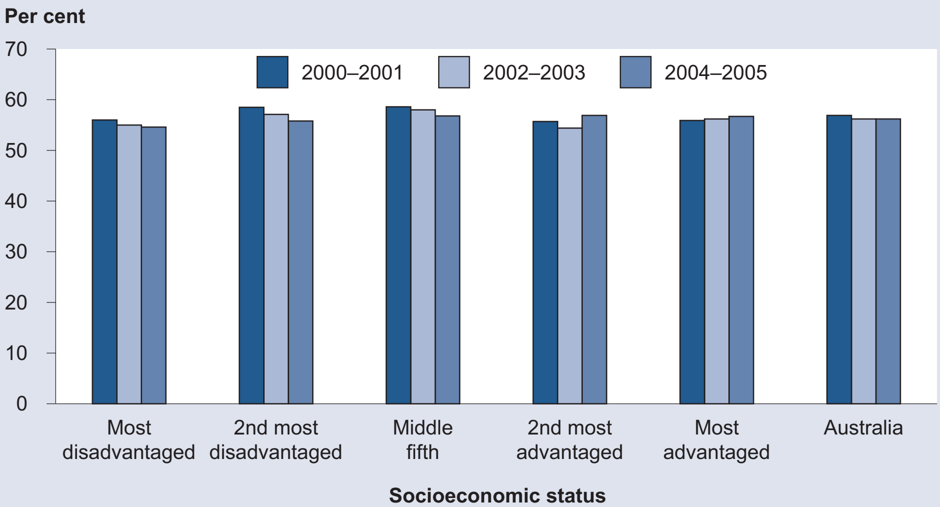
(a) Performance objective for BreastScreen services as set out in the National Accreditation Standards (NQMC 2004).

Source: AIHW analysis of BreastScreen Australia data.

Participation in the BreastScreen Australia program varied significantly across geographic regions. In 2004–2005, the age-standardised participation rates were lower than the national rate (56.2%) for females in the target age group in Major Cities (54.7%) and Very Remote areas (45.9%). The Inner Regional, Outer Regional and Remote areas had rates statistically significantly higher than the national rate (58.0%, 59.5% and 57.8%, respectively). The higher participation rates in Remote areas may reflect the use of mobile BreastScreen services in these areas.

In 2004–2005, females aged 50–69 years in the most socioeconomically disadvantaged areas had a 54.6% participation in BreastScreen Australia, significantly below the national average of 56.2%. Between the years 2000–2001 and 2004–2005 there were significant increases in participation for females in the two most socioeconomically advantaged areas (Figure 7.2), rising from 54.6% for both groups in 2000–2001 to 56.7% for the most advantaged group and to 56.9% for the second most advantaged in 2004–2005.





Notes

1. Rates are the number of females screened as a percentage of the eligible female population calculated as the average of the Australian Bureau of Statistics Estimated Resident Population and age-standardised to the Australian population at 30 June 2001.
2. Periods cover 1 January 1999 to 31 December 2000, 1 January 2002 to 31 December 2003 and 1 January 2004 to 31 December 2005.
3. Areas across Australia are put into five roughly equal groups according to their level of socioeconomic disadvantage.

Source: AIHW analysis of BreastScreen Australia data.

Figure 7.2: Participation of females aged 50–69 years in BreastScreen Australia, 2000–2001, 2002–2003 and 2004–2005

National Cervical Screening Program

Cervical screening in Australia was standardised under the National Cervical Screening Program from 1995 (Box 7.3). The proportion of females in the target age group who were screened under the national program in a 2-year period changed little between the periods 1996–1997 and 2004–2005 (Table 7.3). There was a steady decline in participation among females aged under 40 years from 1998–1999 to 2004–2005 but improvement for older females in the 55–69 year age group. For example, participation fell from 68.7% in 1998–99 to 62.9% in 2004–05 for females aged 30–34 years but increased from 46.5% to 49.7% during the same period for females aged 65–69 years (Table 7.4).

Box 7.3: National Cervical Screening Program

Screening to detect abnormalities of the cervix has been available for Australian females since the 1960s. However, until the early 1990s this screening was unstandardised, with no national agreement on the screening target group or the best interval between screens. Since then it has become progressively more organised and in 1995 the program became known as the National Cervical Screening Program. The major goals of the program are to reduce the incidence and mortality of cervical cancer in females. Cervical screening through Pap tests detects abnormalities of the cervix at an early stage and medical intervention can avert the possible progression to cervical cancer.

Unlike breast screening, cervical screening in Australia does not operate through a separate dedicated screening and assessment service. Instead, screening services are provided as part of mainstream health services, with the great majority of Pap tests performed by general practitioners. Females may claim Medicare rebates for their Pap tests and any subsequent diagnostic follow-up services.

The National Cervical Screening Program has both national and state and territory components. Although policy is usually decided at a national level, coordination of screening activity mainly happens at a state and territory level.

Cervical cytology registries operate in all states and territories. The major functions of the registries are to:

- remind females to attend for screening
- ensure the follow-up of females with abnormal Pap tests
- provide cervical screening histories to laboratories and clinicians to aid reporting and management
- monitor the effects of initiatives to improve participation by females in screening.

The Australian recommendation is for all females who have been sexually active at any stage in their lives to have a Pap test every 2 years until they reach the age of 70 years. Cervical screening is a matter for decision by females, in consultation with their medical practitioners, regardless of the age of the female. Screening may cease at the age of 70 for females who have had two normal Pap tests within the previous 5 years. Females over 70 years who have never had a Pap test or who request one are also screened. However, for reporting purposes the target group is taken to be all females aged 20–69 years who have not had a hysterectomy.

Table 7.3: Females screened by the National Cervical Screening Program, 2-year periods, 1996–1997 to 2004–2005

Years of screening	Target population (ages 20–69)	Participation rate (%)[(a)]
1996–1997	2,563,107	61.0
1998–1999	2,716,364	63.4
2000–2001	3,262,931	61.0
2002–2003	3,318,354	60.7
2004–2005	3,407,219	61.0

(a) Participation rates are age-standardised to the Australian 2001 female population.

Notes

1. Periods cover 1 January 1996 to 31 December 1997 and 1 January 2004 to 31 December 2005.
2. Participation rates have been adjusted for the estimated proportion of females who have had a hysterectomy.
3. These data exclude females who have opted not to be on the register.
4. The Queensland Health Pap Smear registry began in February 1999, so the cervical screening data presented here for years before 1999 exclude Queensland.

Source: AIHW analysis of state and territory Cervical Cytology Registry data.

Table 7.4: Participation of females aged 20–69 years in the National Cervical Screening Program, by age, 1996–1997 to 2004–2005

	Age group										
	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	20–69
	Per cent										
1996–1997	50.0	64.5	66.9	66.4	64.0	64.3	64.0	62.7	50.9	41.2	61.0
1998–1999	53.5	65.5	68.7	68.2	66.5	66.7	64.7	65.9	56.0	46.5	63.4
2000–2001	50.3	61.0	64.9	64.8	64.4	65.0	63.0	64.9	55.3	46.7	61.0
2002–2003	49.0	59.0	63.4	63.9	64.1	65.6	63.1	66.2	56.4	48.8	60.7
2004–2005	47.7	57.8	62.9	64.4	64.8	66.5	64.7	66.9	57.7	49.7	61.0

Notes

1. Age-standardised to the Australian 2001 female population.
2. Periods cover 1 January 1996 to 31 December 1997 and 1 January 2004 to 31 December 2005.
3. Participation rates have been adjusted for the estimated proportion of females who have had a hysterectomy.
4. These data exclude females who have opted not to be on the register.

Source: AIHW analysis of state and territory Cervical Cytology Registry data.

National Bowel Cancer Screening Program

The current phase of the National Bowel Cancer Screening Program began in August 2006, following the success of the Bowel Cancer Screening Pilot Program which was conducted earlier (Box 7.4). The proportion of people responding to an invitation to participate in the National Program in the first 12 months was 31.8% for those aged 55 years and 38.0% for those aged 65 years. The overall crude participation rate was 34.2%. Overall participation of people invited to participate in the Pilot Program cannot be estimated because of the late start of the Pilot Program in Victoria; however, crude participation rates for the Queensland region of Mackay were 70.0% for rescreening of Pilot participants and 19.2% for Pilot invitees.

The participation rates presented in Table 7.5 represent an underestimate of the true screening participation rate. This is because the rates were calculated based on all invitations sent up to 31 July 2007, but only people who had received the invitation and had time to respond by that date were counted as participants. This underestimation does not affect comparisons of rates for different groups, but it does mean that the absolute levels of participation are understated.

Box 7.4: National Bowel Cancer Screening Program

The major goals of the National Bowel Cancer Screening Program are to reduce the incidence and mortality of bowel cancer through screening to detect abnormalities of the colon and rectum early. Early detection of non-cancerous abnormalities can prompt medical intervention that can avert the possible progression to bowel cancer. Where bowel cancer has developed, detection at an early stage makes treatment much more effective.

The first phase of the National Bowel Cancer Screening Program has three components:

- initial screening of people aged 55 or 65 years of age (referred to as the National Program)
- rescreening of those people who participated in the Bowel Cancer Screening Pilot Program (referred to as Pilot participants)
- screening of people who were invited to participate in the Bowel Cancer Screening Pilot Program but declined (referred to as Pilot invitees).

The program was phased in gradually to help ensure that health services, such as colonoscopy and treatment services, were able to meet any increased demand. The program began in Queensland on 7 August 2006 and was progressively rolled out to the remaining states and territories over a period of 7 months.

Unlike the breast or cervical screening programs, eligible people are personally invited to participate in the program. Invitation packs, including a faecal occult blood test (FOBT) kit, are sent directly to eligible people by Medicare Australia and participants are asked to post their completed FOBT to the program's pathology laboratory for analysis. Results of this analysis are sent to the participant, the participant's nominated general practitioner and the National Bowel Cancer Screening Register. Participants with a positive result, indicating blood in their faeces, are advised to consult their general practitioner to discuss further testing. In most cases this will be colonoscopy.

The program is coordinated at the national level by the Australian Government Department of Health and Ageing with assistance from the states and territories. The National Bowel Cancer Screening Register is maintained by Medicare Australia. The major functions of this register are to:

- invite eligible people to participate in the screening program
- ensure follow-up of people with positive FOBT results through the screening pathway
- provide monitoring data to aid reporting and management.

Table 7.5: People responding to the invitation to participate in the National Bowel Cancer Screening Program, 7 August 2006 to 31 July 2007

		Invitations	Participants	Rate (%)
Males	55 years	132,525	37,188	28.1
	65 years	86,816	31,207	35.9
	Total	219,341	68,395	31.2
Females	55 years	132,070	46,911	35.5
	65 years	84,742	33,956	40.1
	Total	216,812	80,867	37.3
Persons	55 years	264,595	84,099	31.8
	65 years	171,558	65,163	38.0
	Total	**436,153**	**149,262**	**34.2**

Notes

1. Participants in the program are defined as members of the eligible population who have been sent an invitation to screen and who have returned a participant details form and/or a completed FOBT kit.
2. Participation rates are people responding as a percentage of the total number of the eligible population who have been sent an invitation to screen.
3. Due to the staggered rollout of the program, some states have had less time to send out and receive responses to invitations to participate by 31 July 2007. Therefore, participation levels are underestimated.

Source: AIHW analysis of National Bowel Cancer Screening Register data.

Immunisation services

This section provides information on childhood and adult vaccinations in 2006–07, with a discussion of incentives that encourage Australians to have vaccinations (Box 7.5). Further information on immunisation services is presented in Chapter 4.

Box 7.5: National Immunisation Program Schedule

The National Health and Medical Research Council—with expert advice from the Australian Technical Advisory Group on Immunisation—recommends a range of vaccinations for all children, older persons and others (including Indigenous Australians) who are medically at higher risk from vaccine-preventable diseases. For the diseases listed on the National Immunisation Program Schedule, free vaccines are funded by the Australian Government, and distribution and administration are the responsibility of the states and territories.

Incentives to vaccinate

The Australian Government provides support to medical practitioners, parents and carers for providing immunisation services. A number of incentives aim at helping Australia reach and maintain national vaccination targets:

- The General Practice Immunisation Incentives scheme, which has three components:
  - a service incentive payment paid to a practitioner who notifies the Australian Childhood Immunisation Register (ACIR) of an immunisation that completes a child's vaccination schedule

(continued)

- – an outcomes payment for practices that achieve 90% or greater proportions of full immunisation for the children attending the practice
  - – infrastructure funding, which provides funds to Divisions of General Practice, State-Based [general practice] Organisations, and funding for a national immunisation coordinator, to improve the proportion of children immunised.
- The Medicare Benefits Schedule includes an item for practice nurses to immunise on behalf of a GP. The item covers the administration of all vaccines on the National Immunisation Program Schedule.
- The Maternity Immunisation Allowance for parents and carers, payable in relation to children from 18 months of age when all their age-specific immunisations have been recorded on the ACIR (or there is documented conscientious objection or medical contraindication). Up-to-date vaccination (or the same exemptions) is also a prerequisite for receiving reimbursements under the Child Care Benefit arrangements.

Childhood vaccinations

The National Immunisation Program Schedule in 2006–07 covered children's vaccinations for diphtheria, tetanus, pertussis (whooping cough), polio, measles, mumps, rubella, *Haemophilus influenzae* type b (Hib), meningococcal type C disease, varicella (chickenpox), pneumococcal disease, hepatitis B, rotavirus and, for females aged 12 years and over, human papillomavirus (HPV). Additionally, for Aboriginal and Torres Strait Islander children living in high-risk areas, hepatitis A is covered.

In 2006–07, nearly 3.7 million immunisations were delivered to children nationally (Table 7.6). The vast majority of these were done in general practice, which was the dominant provider in the six states and the Australian Capital Territory (Table 7.6). In the Northern Territory most vaccinations were administered through community health centres, and in Victoria nearly half were through local government councils.

Table 7.6: Childhood vaccinations by state and territory, 2006–07

Provider type	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust[(a)]
General practice	940,229	528,876	675,433	215,650	180,666	65,738	30,698	1,968	2,639,258
Local government council	46,102	400,437	52,862	17,449	64,488	6,508	0	0	587,846
Community health centre	81,743	3,159	57,742	61,397	19,875	475	23,760	51,598	299,841
Hospital	14,140	8,242	25,750	18,729	1,294	155	245	6,200	74,950
Aboriginal health service or worker	5,712	1,589	9,034	3,380	1,825	0	36	7,353	28,929
State/territory health department	0	0	68	25,859	333	0	17	109	26,386
Other	238	20	2,149	0	128	0	0	0	2,535
Total	**1,088,164**	**942,323**	**823,038**	**342,464**	**268,609**	**72,876**	**54,756**	**67,228**	**3,659,745**

(a) Includes Cocos/Keeling Island, Christmas Island, Norfolk Island and unknown; therefore rows do not add to the 'Australia' column.

Source: Medicare Australia unpublished data.

Adult vaccinations

For adults, influenza and pneumococcal vaccines are available free to all Australians aged 65 years and over, to Indigenous Australians aged 50 years and over, and to medically at-risk younger Indigenous Australians.

For those in the main target group who were vaccinated in 2006, over 98% received their influenza vaccination from a general practitioner (GP) or other doctor. However, for those aged under 65 years who were vaccinated, about four-fifths received their vaccination from a GP and 15% received it from someone at their place of work.

7.2 Primary care and community health services

General practitioner and other non-specialist services funded by Medicare

Seeing a doctor is a very common health-related action in Australia: the 2004–05 National Health Survey indicates that, over any 2-week period, almost one in four Australians visited a doctor (ABS 2006). Further, administrative data from Medicare—Australia's universal health insurance system (Box 7.6)—suggest that around 85% of the population see a doctor at least once in a year (Medicare Australia 2005). Medicare provides funding for general practioner services (this section), specialist services (see Section 7.4) and other services (such as optometry and practice nurse services). The information in this section uses both Medicare data and data from the Bettering the Evaluation and Care of Health (BEACH) survey of general practice activity.

Medicare data provide an overview of the use of general practitioner (GP) and other non-specialist services funded through Medicare, including services provided outside hospitals as well as medical services for private patients in public and private hospitals.

Medicare provided benefits for 114.1 million non-specialist services during 2006–07, representing an increase of 3.7% over the 110.1 million services the previous year. Some of this increase in numbers can be attributed to population growth but it also represents an overall 1.6% increase in the number of GP and non-specialist items per person (DoHA 2007a).

Medicare use has increased over recent years across the broad types of non-specialist services. *Other allied health* and *Practice nurse* Medicare services had the largest percentage increases in items per person (145% and 15% respectively) between 2004–05 and 2006–07, largely attributable to new items. In 2006–07, an average 5.4 non-specialist services per Australian were provided under Medicare. These services included 4.9 *Non-referred medical attendances* per person (that is, GP services, emergency attendances after hours, other prolonged attendances, group therapy, and acupuncture), 0.3 *Optometry* items per person and 0.2 *Practice nurse* items per person (Table 7.7).

Box 7.6: Medicare and Medicare benefits

Australia's universal health insurance scheme came into operation on 1 February 1984. Administered by Medicare Australia (formerly the Health Insurance Commission), the scheme provides for free or subsidised treatment by medical practitioners, participating optometrists, services delivered by a practice nurse on behalf of a general practitioner (GP), certain diagnostic and therapeutic procedures and, for certain services, eligible dentists and allied health practitioners. All Australian residents are eligible for Medicare. Short-term visitors are not eligible unless they are covered by a reciprocal health-care agreement and the services are of immediate medical necessity. The majority of Australian taxpayers contribute to the cost of Medicare through a Medicare levy, which is 1.5% of taxable income. Individuals and families on higher incomes may have to pay a 1% surcharge in addition to the Medicare levy if they do not have private hospital insurance.

Medicare has established a schedule of fees for medical services provided by private practitioners. The payments—known as 'benefits'—that Medicare contributes for those services are based on those fees. Practitioners are not obliged to adhere to the schedule fees, except in the case of participating optometrists and when bulk-billing. However, if they direct-bill (bulk-bill) Medicare Australia for any service rather than issuing a patient with an account, the amount then payable is the Medicare benefit; additional charges cannot be raised for the service and the patient pays nothing for it.

For private patients who are admitted to hospitals or day-hospital facilities, the Medicare benefit is 75% of the schedule fee. For non-hospital services, Medicare pays up to 100% of the schedule fee for GP consultations and up to 85% for services provided by medical specialists. The patient is responsible for the gap between the benefit paid and the schedule fee, up to a maximum of $65.20 (from 1 November 2007), indexed annually. Patients are also responsible for payments of amounts charged above the schedule fee.

Further measures take into account situations where, despite normal Medicare benefits, the costs over time for a patient or family may still become a burden. First, for out-of-hospital services the maximum amount of gap payable by a family group or an individual in any one calendar year is $365.70 (from 1 January 2008), indexed annually. Thereafter, patients are reimbursed 100% of the schedule fee unless the service was billed at less than the schedule fee. Second, under the extended safety net, Medicare will meet 80% of the out-of-pocket costs (that is, the difference between the fees charged by the doctor and the Medicare benefits paid) for out-of-hospital medical services, once an annual threshold is reached ($529.30 for families in receipt of Family Tax Benefit Part A and for concession card holders, or $1,058.70 for all other individuals and families). In addition, for medical expenditure in certain categories (including Medicare payable items), a 20% rebate on net medical expenses over $1,500 can be claimed through the income tax system.

Another component of Medicare—sometimes termed 'hospital Medicare'—provides for free public hospital care for all Australians residents, either as an admitted patient, outpatient or emergency department patients. Doctors appointed by the hospitals provide medical care for such 'public' patients at no cost to the patient. Patients who choose to be treated in private hospitals, or as private patients in public hospitals, are liable for hospital accommodation and other charges, and for a portion of the medical fees charged by private practitioners.

(continued)

Medicare statistics

Medicare data provide information on the use of private medical services, which include services provided outside hospitals as well as medical services for private patients in public and private hospitals. The scheme covers a range of different services, from a single doctor consultation to multiple pathology tests for a single patient episode, each of which is counted as a separate item. Consequently, it is not possible to directly compare different types of services based on the number of Medicare items. Also for this reason, the terms 'items' or 'items of service' are generally used when referring to Medicare services.

The count of items is subject to changes in bundling and unbundling of services, so the count is not always completely comparable between years. Further, the scope of coverage has changed over time; in particular, new items have been introduced in the past few years to cover things such as:

- practice nurses providing services on behalf of a GP
- selected mental health services including those provided by registered psychologists, clinical psychologists, occupational therapists and social workers
- selected allied health practitioner services for people with complex conditions that are being managed by a medical practitioner under an Enhanced Primary Care multidisciplinary care plan.

In 2006–07 Medicare provided:

- benefits for 257.9 million services (9.1% higher than in 2005–06)
- a total of $11.7 billion in benefits
- an average of 12.3 services per Australian. There was considerable variability in the number of services. For example, 3.2% of the population received 51 or more services each (accounting for 24.0% of total benefits paid) and around a third of the population received 1–5 services per person, accounting for 6% of the total benefits (DoHA 2007a).

Table 7.7: Medicare items processed for GP and other non-specialist services, 2004–05 to 2006–07

	Items per person				Items in 2006–07		
	Number			Average annual change		Proportion of total	Benefits paid
Broad type of service	**2004–05**	**2005–06**	**2006–07**	**(%)**	**Number ('000)**	**(%)**	**($ million)**
Non-referred medical attendances[(a)]	4.83	4.91	4.93	1.0	103,433	90.6	4,029.6
Practice nurse	0.13	0.16	0.17	14.8	3,664	3.2	38.9
Optometry	0.25	0.26	0.26	1.9	5,473	4.8	239.8
Other allied health	0.01	0.03	0.07	144.8	1,554	1.4	97.5
Total non-specialist items[(b)]	**5.22**	**5.35**	**5.43**	**2.0**	**114,124**	**100.0**	**4,405.8**

(a) Includes GP attendances, emergency attendances, attendances after hours, other prolonged attendances, group therapy and acupuncture.

(b) Excludes dental services covered by Medicare.

Source: Medicare Australia 2007.

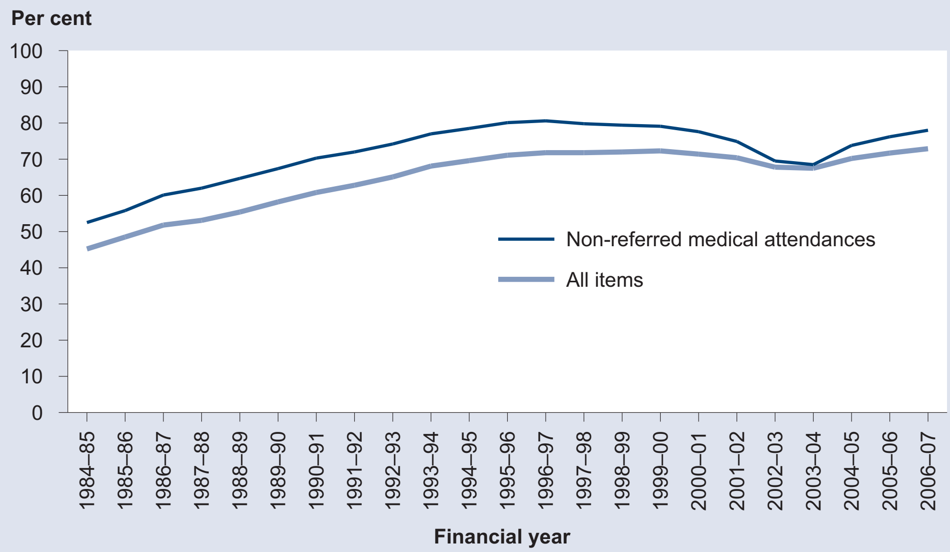
Benefits paid

In 2006–07, a total of $4,406 million was paid in Medicare benefits for non-specialist services, accounting for 38% of total Medicare benefits paid. The vast majority of these were paid for the 103 million *Non-referred medical attendances* (91% of non-specialist benefits or $4,030 million). A further $239.8 million (5%) was paid for 5.5 million *Optometry* items and $97.5 million (2%) for 1.6 million *Other allied health* items (Table 7.7).

Bulk-billing by GPs (*NHPC indicator 3.17)*

Bulk-billing rates act as a barometer of the affordability of medical care: when a service is bulk-billed, the provider directly bills Medicare Australia the amount payable under the Medicare Benefits Schedule, so there is no out-of-pocket expense for the patient. Cost is then not an obstacle to receiving care.

Bulk-billing rates for *Non-referred medical attendances (*including *Practice nurses)* increased from 52.5% in 1984–85 to a high of 80.6% in 1996–97, fell to 68.5% in 2003–04, and rose to 78.0% in 2006–07. The trend in bulk-billing for *Non-referred medical attendances* followed a similar pattern to overall service bulk-billing throughout this period. Bulk-billing rates across all items increased from 45.2% in 1984–85 to 72.3% in 1999–00, decreased to 67.5% in 2003–04, and rose to 72.9% in 2006–07 (Figure 7.3).



Note: Non-referred medical attendances includes general practitioner services, emergency attendances after hours, other prolonged attendances, group therapy, acupuncture and practice nurse items.

Source: DoHA 2007a.

Figure 7.3: Bulk-billing rates for all Medicare items and for non-referred medical attendance items, 1984–85 to 2006–07 (*NHPC indicator 3.17*)

Geographic variation

There are variations in the use of non-specialist Medicare services among the states and territories. In 2006–07, the highest number of non-specialist services per person was recorded in New South Wales with 5.9 services, followed by South Australia (5.6) and Victoria (5.4). The Northern Territory recorded the lowest per person use of medical services with 2.9 (Table S39). However, this is partly offset by primary health services being provided to Aboriginal and Torres Strait Islander peoples through Medicare, in particular community controlled health-care services.

General practice activity

An insight into GP activity and practice patterns since 1998 can be derived from data from the BEACH program, a continuous study of general practice activity in Australia. BEACH describes patient problems seen in general practice and how GPs manage them. This section provides an overview of results from the ninth year of the BEACH program, and describes some changes in practice patterns from 1998–99 to 2006–07. It also includes some Medicare Benefits Schedule (MBS) and other Department of Health and Ageing data on NHPC indicators for general practice services provided to particular population groups and for specific health problems.

Box 7.7: The BEACH survey of general practice activity

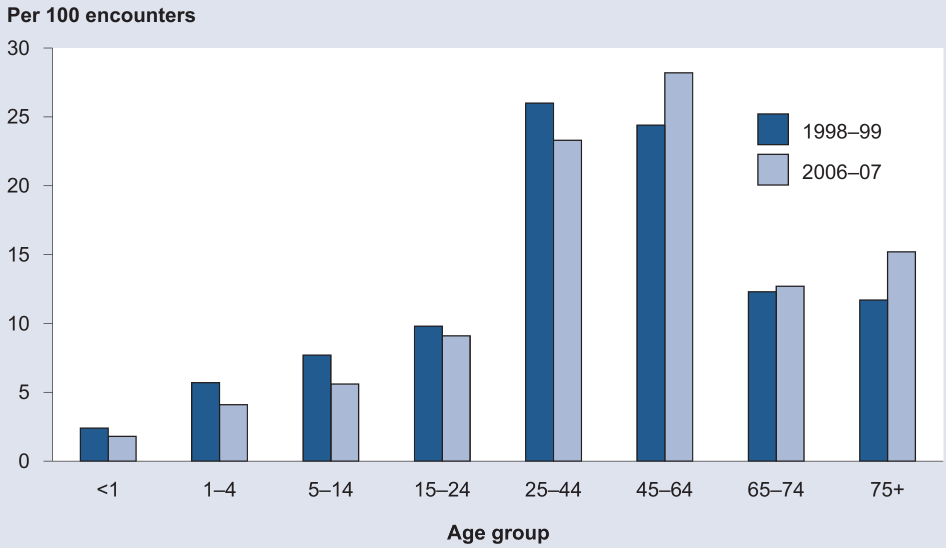
The BEACH survey (Bettering the Evaluation and Care of Health) is run by the Australian General Practice Statistics and Classification Centre (an AIHW collaborating unit within the Family Medicine Research Centre, University of Sydney). BEACH began in April 1998 and each year about 1,000 GPs from a random sample participate, providing details of about 100,000 GP–patient encounters which represent more than one hundred million such encounters across the country each year. No information identifying patients is collected.

GPs who claimed at least 375 general practice Medicare items of service in the previous 3 months form the source population. This equates with 1,500 Medicare claims a year and ensures inclusion of the majority of part-time GPs while excluding those who are not in private practice but may claim for a few consultations a year. Participating GPs each complete details on about 100 consecutive patient encounters on structured forms and provide information about themselves and their practice. Questions about selected patient health risk factors and health states are asked of sub-samples of patients.

From April 2006 to March 2007, 930 GPs provided details for 93,000 patient encounters. After weighting for an under-representation of young GPs, there were 91,805 encounters on which the following results are based.

Who accounts for most general practice work?

The workloads of GPs are changing in terms of the patients with whom they spend most time. Between 1998–99 and 2006–07, encounters with patients aged 45–64 years increased from 24.4% to 28.2% of total encounters recorded. The proportion of patients 75 years and over also increased, from 11.7% to 15.2%. There was a decrease in the proportion of younger patients. Specifically, encounters with patients aged under 1 year fell from 2.4% to 1.8% of all encounters, those with patients aged 1–4 years fell from 5.7% to 4.1%, and those with 5–14 year olds fell from 7.7% to 5.6%. There was also a significant decrease in the proportion of patients aged 25–44 years (from 26.0% in 1998–99 to 23.3% in 2006–07) (Figure 7.4). There has been a slight but significant trend towards an increase in the proportion of encounters that were with males, although females still accounted for 56% of all GP encounters in 2006–07.



Source: Britt et al. 2008.

Figure 7.4: Age distribution of patients at encounter, 1998–99 and 2006–07

Why do people see a general practitioner?

For every 100 GP–patient encounters, patients presented with an average of 151 reasons for their encounters (RFEs) in 2006–07. The RFEs are the patients' reasons for seeing the doctor, as stated or implied by the patient to the GP. Almost half the patient RFEs were descriptions of symptoms or complaints, about 20% were described in terms of a known diagnosis (for example, 'about my diabetes'), and the balance were requests or need for a service of some type (such as referrals, tests and administrative procedures). About half the RFEs related to the respiratory, musculoskeletal, skin, circulatory or digestive systems.

A request for a partial or full check-up was the most common RFE (14.6 per 100 encounters), followed by the need for medication or repeat prescriptions (11.8) and attendance to receive test results (6.9). Frequent symptoms presented included cough, throat complaints, back complaints, rash and abdominal pain. The fifth most common RFE was a need for immunisation or vaccination (Table 7.8).

Between 1998–99 and 2006–07, the rate at which patients present to GPs citing a need to get test results doubled, and requests for prescriptions rose 40%. The rate at which patients gave reasons associated with symptoms such as abdominal pain, headache and ear pain fell by 15–20% over these years.

Table 7.8 : GP consultations: 20 most frequent patient reasons for encounter, 2006–07

Patient reason for encounter	Per cent of total RFEs	Per 100 encounters
Check-up	9.7	14.6
Prescription	7.8	11.8
Test results	4.6	6.9
Cough	3.8	5.8
Immunisation/vaccination	2.9	4.3
Throat complaint	2.2	3.3
Back complaint	2.1	3.2
Rash	1.9	2.8
Upper respiratory tract infection	1.6	2.4
Hypertension/high blood pressure	1.4	2.1
Depression	1.3	1.9
Fever	1.2	1.8
Abdominal pain	1.2	1.8
Administrative procedure	1.1	1.6
Headache	1.0	1.6
Skin complaint	0.9	1.4
Ear pain	0.9	1.4
Weakness/tiredness	0.9	1.4
Diarrhoea	0.9	1.3
Knee complaint	0.8	1.3

Source: Britt et al. 2008.

What problems do GPs manage?

GPs managed an average 1.5 problems at each patient encounter in 2006–07. The number of problems managed increased with age from 118 per 100 encounters among babies (under 1 year) to more than 170 with the elderly (75 years and over).

Problems related to the respiratory system, the skin, the cardiovascular system and the musculoskeletal system together accounted for about 60% of all problems managed. The 20 problems most frequently managed accounted for 43.3% of all problems managed, the most common being hypertension (high blood pressure: 9.6 per 100 encounters), check-ups (6.6), upper respiratory tract infection (5.8), immunisation/vaccination (4.7) and diabetes, arthritis and depression (each at 3.7) (Table 7.9). One in every five problems remained undiagnosed at the end of the consultation, the GP describing the problem in terms of a symptom or complaint.

Over a third of the problems managed were chronic (persisting over a long period). At least one chronic problem was managed at 40% of all encounters and they were managed at an average rate of 52 per 100 encounters.

The chronic problems managed most often by GPs were hypertension, diabetes, depressive disorder, lipid (cholesterol-related) disorders, osteoarthritis, oesophageal disease and asthma. Together these seven accounted for more than half of all the chronic problems managed and 20% of all the problems managed.

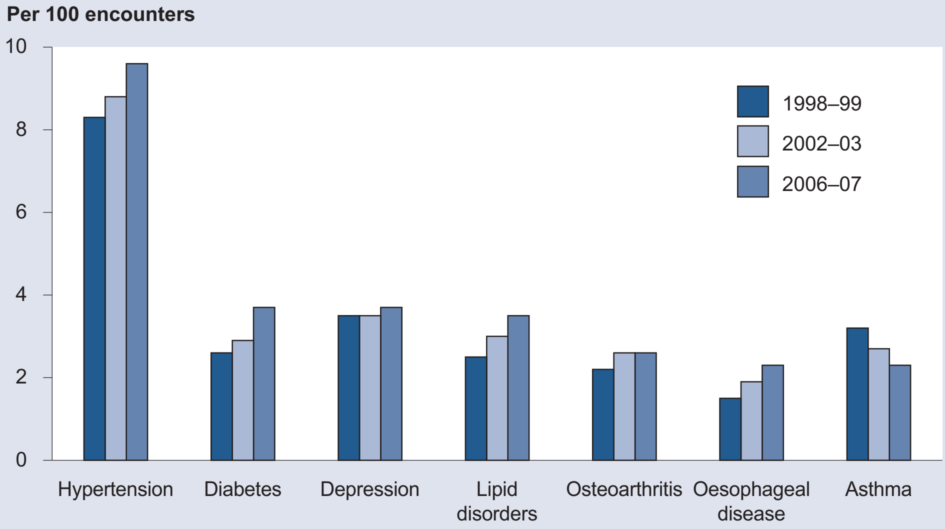
Table 7.9: GP consultations: 20 problems most often managed, 2006–07

Problem managed	Per cent of total problems	Per 100 encounters
Hypertension	6.4	9.6
Check-up	4.4	6.6
Upper respiratory tract infection	3.9	5.8
Immunisation/vaccination	3.2	4.7
Arthritis	2.5	3.7
Diabetes	2.5	3.7
Depression	2.5	3.7
Lipid disorders	2.3	3.5
Back complaint	1.8	2.6
Oesophageal disease	1.5	2.3
Asthma	1.5	2.3
Acute bronchitis/bronchiolitis	1.5	2.2
Prescription	1.5	2.2
Contact dermatitis	1.3	1.9
Anxiety	1.2	1.7
Gastroenteritis	1.1	1.7
Urinary tract infection	1.1	1.6
Sleep disturbance	1.1	1.6
Test results	1.0	1.6
Sprain/strain	1.0	1.5

Source: Britt et al. 2008.

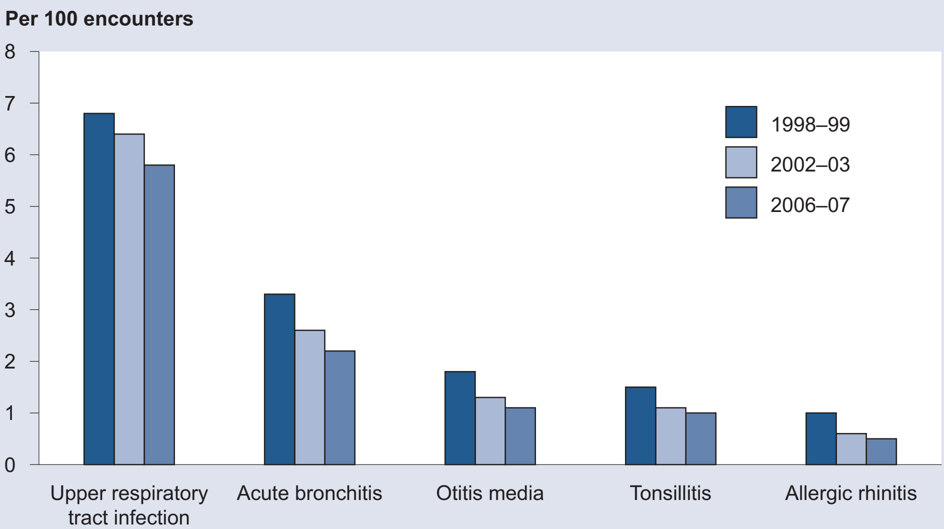
Between 1998–99 and 2006–07, there were statistically significant increases in the management rates of some problems including hypertension, diabetes, lipid disorders and oesophageal disease; and a marginal increase in the management rate of osteoarthritis (Figure 7.5). Over the same period there was a statistically significant decrease in the management rate of asthma and no significant change in the management rate of depression.

Some acute problems are being managed less often than they were previously. Acute problems less frequently managed in 2006–07 than in 1998–99 include upper respiratory tract infections, acute bronchitis, otitis media, tonsillitis and allergic rhinitis (Figure 7.6).



Source: Britt et al. 2008.

Figure 7.5: Changes in management rate of selected chronic problems, 1998–99 to 2006–07



Source: Britt et al. 2008.

Figure 7.6: Decreases in management rate of selected acute problems, 1998–99 to 2006–07

How do GPs manage the problems?

GPs have a range of management techniques available to them including use of medications by prescription, direct supply (of some vaccines and product samples), or advice for purchase over-the-counter (OTC); providing advice and counselling; undertaking procedures; referring to other services; and conducting or ordering investigations. At the 91,805 encounters recorded in the 2006–07 sample, GPs undertook 193,591 management activities in total—211 per 100 encounters and 142 per 100 problems managed. For 15% of problems managed, there were no specific management actions recorded.

The most common management form was medication (prescribed, GP-supplied, or advised). For an 'average' 100 GP–patient encounters, GPs provided 83 prescriptions, 30 clinical treatments, undertook 15 procedures, made 8 referrals to specialists and 3 to allied health services, and placed 42 pathology test orders and 9 imaging test orders (Table 7.10).

Table 7.10: GP consultations: management activities, 2006–07

Management type	Number per 100 encounters	Number per 100 problems
Medications	101.5	68.4
Prescribed	83.3	56.1
GP-supplied	8.9	6.0
Advised OTC	9.4	6.3
Other treatments	44.7	30.1
Clinical (advice/counsel)	29.5	19.9
Procedures	15.2	10.2
Referrals	12.2	8.2
Specialist	8.0	5.4
Allied health	3.1	2.1
Hospital	0.4	0.3
Emergency department	0.2	0.1
Other medical services	0.1	0.1
Other referral	0.4	0.3
Pathology	42.4	28.6
Imaging	9.0	6.0
Other investigations	1.1	0.7
Total management activities	**210.9**	**142.0**

Source: Britt et al. 2008.

There were 102 medications recorded per 100 encounters, or 68 per 100 problems managed. The vast majority of these (82.1%) were prescribed, one in ten was advised for OTC purchase and 8% were supplied to the patient by the GP. Medications were prescribed at a rate of 83 per 100 encounters or 56 per 100 problems managed, at least one being prescribed for 47% of problems managed.

There was a significant decrease in the rate of prescribed medications, from 94 per 100 encounters in 1998–99 to 83 in 2006–07.

The use of clinical treatments in managing problems rose from 31 per 100 encounters in 1998–99 to 39 per 100 in 2004–05. However, it then fell sharply to 29 per 100 in 2005–06 and remained at that level in 2006–07. This probably reflects recent increasing reliance on practice nurses to undertake some of these clinical activities independently of the GP–patient consultations, and the introduction of MBS items for practice nurse services.

GPs are undertaking more procedures, with numbers increasing from 12 per 100 encounters in 1998–99 to 15 in 2006–07. They are also referring their patients more often (from 11 per 100 encounters in 1998–99 to 12 in 2006–07). This reflects significant increases in referrals to specialists (from 7 to 8 per 100 encounters), with no change in the referral rate to allied health professionals.

Between 2000–01 and 2006–07, the rate of pathology test ordering increased by 40%, from 30 orders per 100 encounters to 42. There was also a smaller but significant increase in the rate of imaging tests ordered, from 8 per 100 encounters in 2000–01 to 9 in 2006–07.

Appropriate use of antibiotics *(NHPC indicator 3.10)*

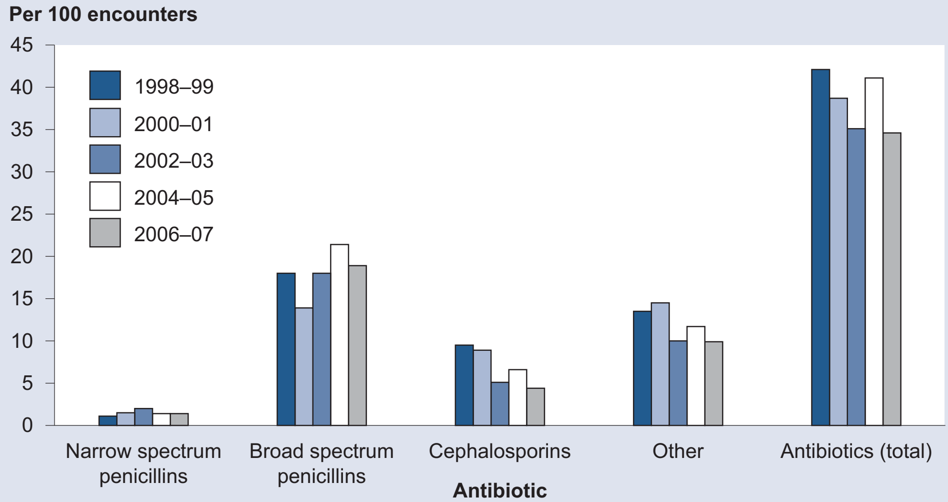
This section presents information on the management of upper respiratory tract infections (URTIs) with antibiotics. URTIs without complications are most often caused by viruses. Antibiotics have no effectiveness in treating viral infections, but are still frequently prescribed. Overuse of antibiotics increases antibiotic resistance in the general population. A decline in the prescribing rate of antibiotics for URTI may be an indication of more appropriate management of viral infections.

Prescriptions written by GPs in the BEACH survey were used as the data for this indicator (Britt et al. 2008). Data from the Pharmaceutical Benefits Scheme were not used for this indicator because they do not include information on diagnosis or on medications that fall below the subsidy threshold, or are provided through private prescriptions. It should be noted that GP prescribing numbers are somewhat higher than the prescriptions actually filled by pharmacists.

In 2006–07, URTI was the third most frequently managed problem in Australian general practice, at a rate of 5.8 per 100 encounters. This has decreased significantly since 1998–99 (6.8 per 100 encounters) (Britt et al. 2008). URTI was the second most common problem for which antibiotics were prescribed or supplied in 2006–07 (13.2%) after acute bronchitis/bronchiolitis (14.0%) (unpublished BEACH data).

The rate at which antibiotics (all types) were prescribed or supplied for URTI fluctuated during the period 1998–99 to 2006–07, and was 42.1 per 100 URTI problems in 1998–99 and 34.6 in 2006–07 (Figure 7.7). There was a statistically significant decline for both cephalosporins and 'other' antibiotics (which include tetracyclines and macrolides). The rate of prescription and supply of cephalosporins halved from 9.5 per 100 URTI problems in 1998–99 to 4.4 in 2006–07 and the corresponding rate for 'other' antibiotics decreased from 13.5 to 9.9.

The rate of prescription or supply of broad spectrum penicillins has fluctuated over the years but was no different in 2006–07 than in 1998–99. A slight increase in the prescription and supply rate of narrow spectrum penicillins did not reach statistical significance.

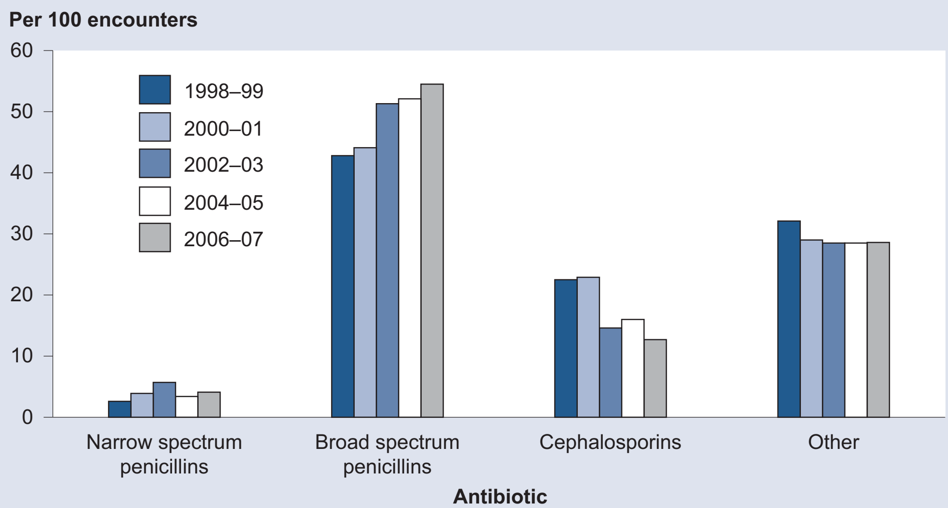


Note: Year refers to BEACH data year, which runs from April to March.

Source: Britt et al. 2008.

Figure 7.7: Prescribing rates of antibiotics for URTIs, 1998–99 to 2006–07

Examining the relative prescription and supply of specific groups of antibiotics as a percentage of all antibiotics prescribed and supplied for URTIs, shows that cephalosporins are taking up a much smaller proportion of the whole in 2006–07 (12.7%) than in 1998–99 (24.1%). Although the rate of 'other' antibiotic prescription and supply decreased overall, its proportion of total antibiotics did not significantly change between 1998–99 and 2006–07. However, broad spectrum penicillins, as a proportion of all antibiotics for URTI, increased from 42.8% in 1998–99 to 54.5% in 2006–07 (Figure 7.8).



Note: Year refers to BEACH data year, which runs from April to March.

Source: Britt et al. 2008.

Figure 7.8: Percentage of antibiotics prescribed for URTIs, 1998–99 to 2006–07

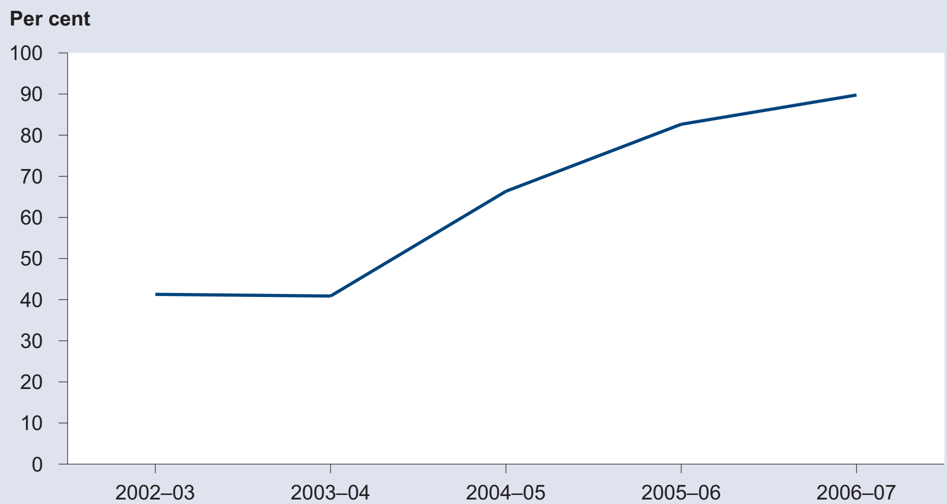
In summary, there has been a decrease in the prescription and supply of antibiotics for the management of URTIs in Australian general practice, representing a 17% reduction since 1998–99. This change is most apparent in a 50% decrease in the prescription and supply of cephalosporins.

Enhanced primary care services *(NHPC indicator 3.22)*

The enhanced primary care (EPC) Medicare items provide the framework for a multidisciplinary approach to health care through a more flexible, efficient and responsive match between care recipients' needs and services. The EPC items support annual voluntary health assessments for older Australians, and care planning and case conferencing services for people of any age with chronic conditions and complex care needs. The percentage of 'active' GPs who use EPC items in the MBS is a measure of the extent of GP involvement in continuity and coordination of care.

The uptake of Medicare EPC items by GPs increased markedly from 41% in 2002–03 to 90% in 2006–07 (Figure 7.9). There were 7,153, 'active' GPs who used at least one Medicare EPC item in 2002–03, compared with 16,594 in 2006–07.

At 92%, the uptake for 2006–07 was highest in New South Wales and Victoria (Figure 7.10). Other jurisdictions were close to the national average (90%) except the Northern Territory and the Australian Capital Territory, where the uptake was lower at 80%.

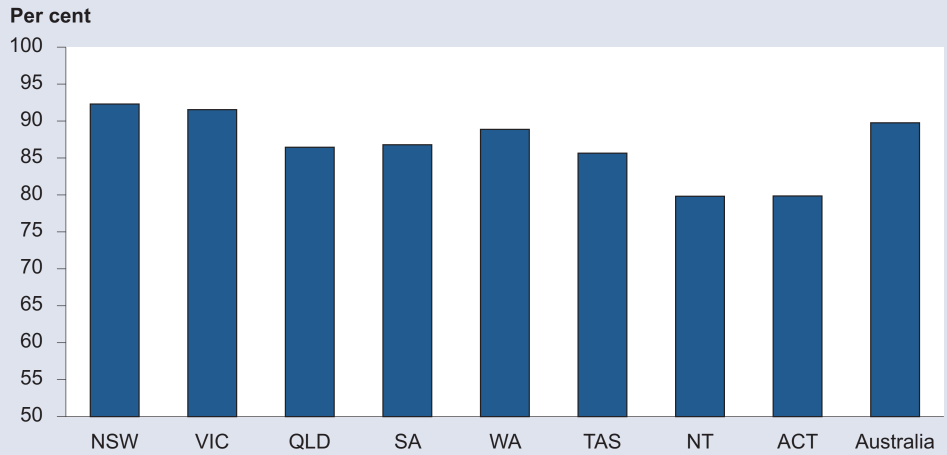


Notes

1. The enhanced primary care items (EPC) include health assessments (A14), multidisciplinary care plans (A15 sub group 1) and case conferences (A15 sub group 2, excluding items relating to consultant physicians and psychiatrists).
2. Percentage of 'active' GPs using EPC items is estimated by dividing the number of medical practitioners who claimed at least one EPC item within the state/territory during the quarter and who also claimed 375 or more non-referred attendances within the state/territory during the year, by the number of medical practitioners eligible to claim EPC items who claimed 375 or more non-referred attendances within the state/territory during the year.

Source: Department of Health and Ageing unpublished data.

Figure 7.9: Percentage of 'active' GPs using Medicare enhanced primary care (EPC) items, 2002–03 to 2006–07



Notes

1. The enhanced primary care items (EPC) include health assessments (A14), multidisciplinary care plans (A15 sub group 1) and case conferences (A15 sub group 2, excluding items relating to consultant physicians and psychiatrists).
2. Percentage of 'active' GPs using EPC items is estimated by dividing the number of medical practitioners who claimed at least one EPC item within the state/territory during the quarter and who also claimed 375 or more non-referred attendances within the state/territory during the year, by the number of medical practitioners eligible to claim EPC items who claimed 375 or more non-referred attendances within the state/territory during the year.

Source: Department of Health and Ageing unpublished data.

Figure 7.10: Percentage of 'active' GPs using Medicare enhanced primary care (EPC) items, by state and territory, 2006–07

Health assessments by general practitioners *(NHPC indicator 3.23)*

This indicator is derived from Medicare Benefits Schedule data for older Australians not in residential aged care who have received an EPC annual voluntary health assessment.

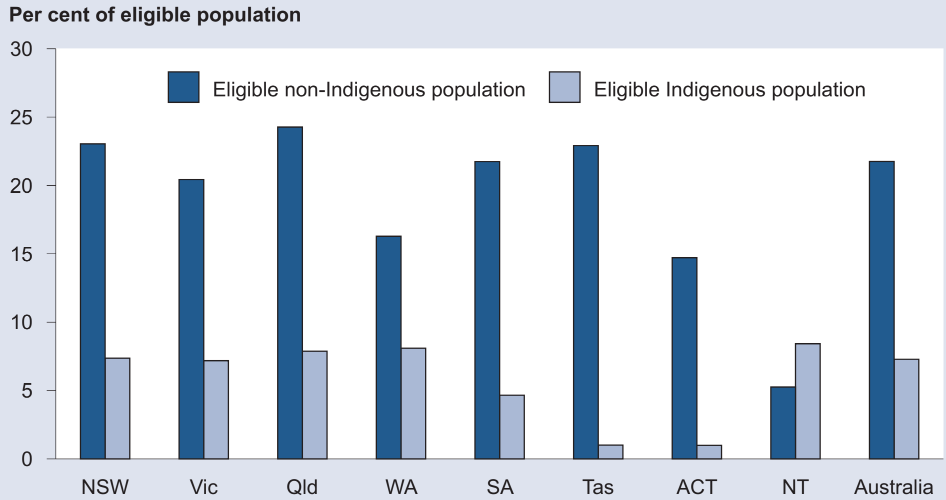
In 2005–06, 21% of the eligible non-Indigenous Australian population received a voluntary health assessment, compared with 7% in the eligible Aboriginal and Torres Strait Islander population. Differences between estimates for Indigenous and non-Indigenous populations should be interpreted with caution, because of problems of identification of Indigenous patients.

Box 7.8: Annual voluntary health assessments

Medicare Benefits Schedule (MBS) items for annual voluntary health assessments for older Australians were introduced in November 1999. These assessments provide an opportunity for a GP to undertake an in-depth assessment of the patient's health. Health assessments cover the patient's medical, physical, psychological and social function. These assessments enable timely preventive and treatment actions to enhance the health of the patient.

The eligible population is defined in terms of specific age ranges for both the non-Indigenous Australian population (ages 75 years and over) and for Aboriginal and Torres Strait Islander peoples (ages 55 years and over). The lower age range for Aboriginal and Torres Strait Islander peoples recognises that they face increased health risks at a much earlier age than most other groups in the population, and broadly reflects the difference in average life expectancy for the two population groups.

The proportion receiving annual health assessments showed a large variation across states and territories (Figure 7.11). For the non-Indigenous Australian population in 2005–06, it varied from 5% in the Northern Territory to 24% in Queensland. For the Aboriginal and Torres Strait Islander population, it varied from 1% in Tasmania and the Australian Capital Territory to 8% in Queensland, Western Australia and the Northern Territory.



Notes

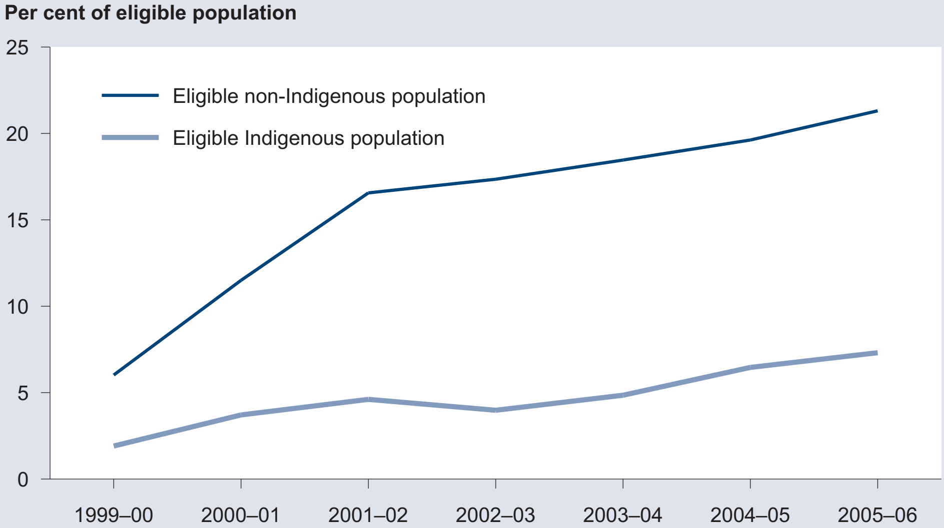
1. Eligible non-Indigenous population = (Overall population 75 years and over) less (Aboriginal and Torres Strait Islander population 75 years and over) less (Residential aged care facility population (other Australians) 75 years and over).
2. Eligible Indigenous population = (Aboriginal and Torres Strait Islander population 55 years and over) less (Aboriginal and Torres Strait Islander population in residential aged care facilities 55 years and over).
3. Medicare Benefit Schedule items included are EPC item nos. 700, 704, 702 and 706. EPC items 700 and 704 cover health assessments undertaken in consulting rooms; items 702 and 706 cover health assessments undertaken wholly or partly in the patient's home.
4. Population figures are based on the ABS estimated resident population and the projected Indigenous population (low series) at 30 June 2005.
5. Residential age care population figures are are taken from AIHW 2006.
6. Differences between estimates for Indigenous and non-Indigenous populations should be interpreted with caution because of problems of identification of Indigenous patients.

Source: Department of Health and Ageing unpublished data.

Figure 7.11: Proportion of the eligible population receiving enhanced primary care health assessment, by Indigenous status and state and territory, 2005–06

Between 1999–00 and 2005–06, the proportion of people within the eligible population who received an annual voluntary health assessment increased from 6% to 22% for the non-Indigenous population, and from 2% to 7% for Aboriginal and Torres Strait Islander peoples (Figure 7.12).

The proportion of eligible Aboriginal and Torres Strait Islander peoples receiving an EPC annual health assessment in the Northern Territory was higher than that for the non-Indigenous population in 2005–06. In every other state and territory, the proportion of the eligible population receiving an EPC annual health assessment was higher among the non-Indigenous population than the Indigenous population.



Notes

1. Eligible non-Indigenous population = (Overall population 75 years and over) less (Aboriginal and Torres Strait Islander population 75 years and over) less (Residential aged care facility population (other Australians) 75 years and over).
2. Eligible Indigenous population = (Aboriginal and Torres Strait Islander population 55 years and over) less (Aboriginal and Torres Strait Islander population in residential aged care facilities 55 years and over).
3. Medicare Benefits Schedule items included are EPC item nos. 700, 704, 702 and 706. EPC items 700 and 704 cover health assessments undertaken in consulting rooms; items 702 and 706 cover health assessments undertaken wholly or partly in the patient's home.
4. Population figures are based on the ABS estimated resident population and the projected Indigenous population (low series). The population at the start of the reporting period was used for each year.
5. Residential aged care population numbers are taken from *Residential aged care in Australia: a statistical overview* (1999–00 to 2004–05).
6. Differences between estimates for Indigenous and non-Indigenous populations should be interpreted with caution because of problems of identification of Indigenous patients. A voluntary Indigenous identifier was introduced on Medicare Australia records in November 2002.

Source: Department of Health and Ageing unpublished data.

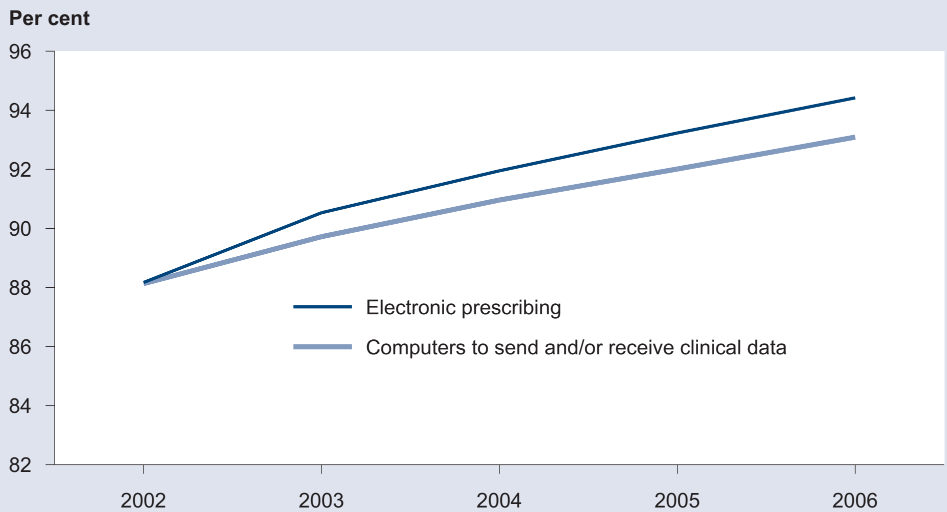
Figure 7.12: Rate of enhanced primary care health assessment by Indigenous status, 1999–00 to 2005–06

Electronic prescribing and clinical data in general practice *(NHPC indicator 3.20)*

The use of software to generate prescriptions electronically improves safety by reducing errors of prescribing and dispensing and adverse drug reactions. Electronic transfer of clinical information improves practice efficiency by providing access to timely and reliable clinical data, and by improved maintenance of health records for patients.

The Practice Incentive Program (PIP) provides financial incentives for aspects of general practice (such as electronic prescribing) that contribute to quality care and better patient outcomes. In 2005–06, PIP practices covered 80% of all patient care provided by GPs in Australia, measured in terms of standardised whole patient equivalents.

In May 2006, there were a total of 4,745 practices participating in PIP. Most PIP practices used electronic prescribing (94%) and transferred clinical data electronically (93%) (Figure 7.13). Between 2002 and 2006, the use of computers increased from 88% to 94% for electronic prescribing, and from 88% to 93% for sending and receiving clinical data.

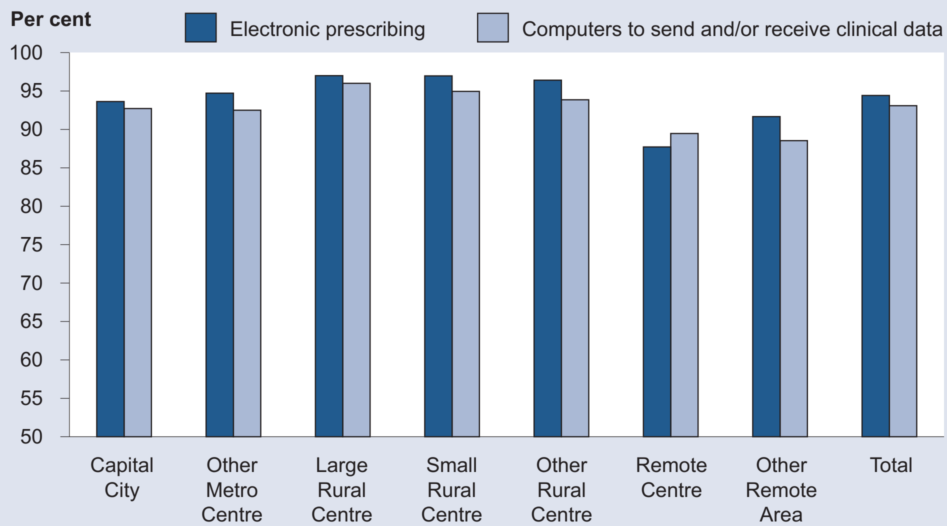


Note: These data are only indicative of activity in general practice as not all practices participate in PIP and participation varies across Australia.

Source: Department of Health and Ageing unpublished data.

Figure 7.13: Use of computers for clinical purposes, percentage of PIP practices in May, 2002–2006

Use of computers for electronic prescribing was highest in rural areas (96 to 97% of PIP practices) and lowest in remote areas (88 to 92%). Use of computers for sending and/or receiving clinical data showed a similar pattern (Figure 7.14).



Notes

1. These data are only indicative of activity in general practice as not all practices participate in PIP and participation varies across Australia.
2. Capital City = state and territory capital city statistical divisions; Other Metropolitan Centre = one or more statistical subdivisions that have an urban centre with a population of 100,000 or more; Large Rural Centre = SLAs where most of the population resides in urban centres with a population of 25,000 or more; Small Rural Centre = SLAs in rural zones containing urban centres with populations between 10,000 and 24,999; Other Rural Centre = all remaining SLAs in rural zone; Remote Centre = SLAs in the remote zone containing populations of 5,000 or more; Other Remote Area = all remaining SLAs in the remote zone.

Source: Department of Health and Ageing unpublished data.

Figure 7.14: Use of computers for clinical purposes, percentage of PIP practices, by geographical region, 2006

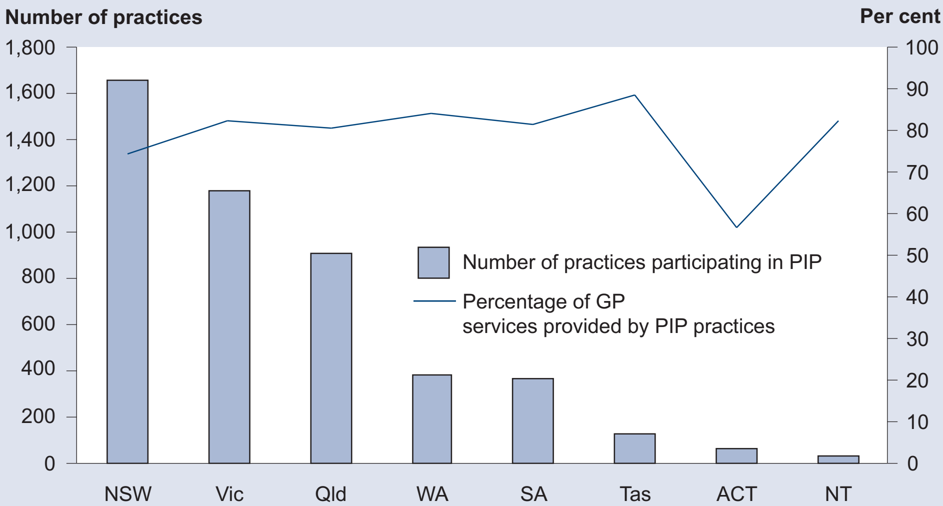
Accreditation in general practice *(NHPC indicator 3.24)*

Accreditation of general practice is an indicator of the quality of health care delivered by GPs through a process of continuous quality improvement. It is a voluntary process of peer review that involves the assessment of general practices against standards developed by the Royal Australian College of General Practitioners.

Practices can gain accreditation through either Australian General Practice Accreditation Limited or GPA Accreditation Plus. This means that practices have shown that they complied with various criteria against a set of national standards.

A measure of the provision of quality health care through general practice is the proportion of total practices that are accredited in Australia. Due to data availability constraints, an alternative measure is presented here—the proportion of total GP services that are provided by practices participating in the Practice Incentives Program (PIP). Since practices must be accredited or registered for accreditation to join the PIP, data from this program are broadly representative of the number of accredited practices.

In May 2006, there were 4,745 practices participating in the PIP. PIP practices provided 85.2 million GP services during 2005–06. The proportion of GP services provided by practices participating in the PIP was 80% for Australia in 2005–06 and exceeded 75% of the total number of GP services in each jurisdiction, with the exception of the Australian Capital Territory (Figure 7.15).



Source: Department of Health and Ageing unpublished data.

Figure 7.15: Number of accredited practices participating in the PIP and the proportion of GP services provided by these practices, 2005–06

Availability of GP services *(NHPC Indicator 3.18)*

GPs are often the first point of contact for health services. Their availability, therefore, reflects accessibility to health services, particularly to primary care.

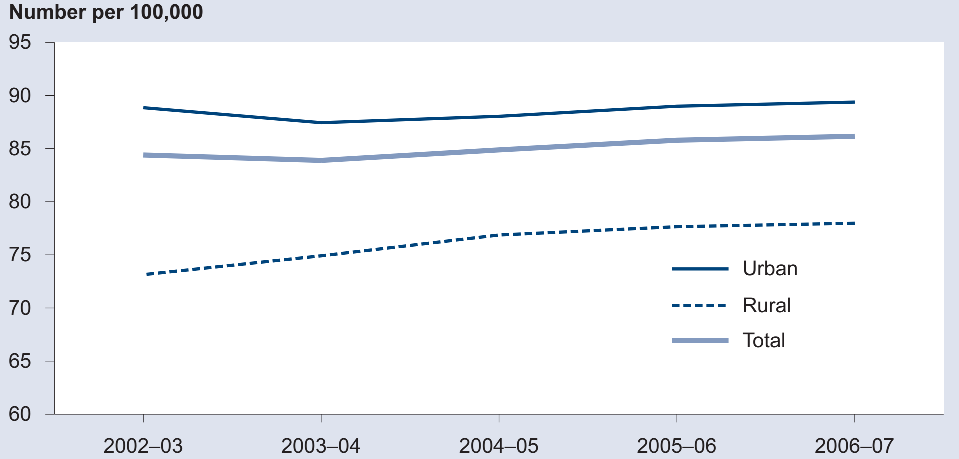
During 2006–07, there were 25,564 non-specialist medical practitioners who had at least one Medicare item processed. This figure provides an estimate of the stock of GPs who bill Medicare but does not account for large variations in the number of services provided, and gives the same weight to full-time, part-time and casual GPs. A standardised measure is used to estimate the workforce supply of GPs. The full-time workload equivalent (FWE) adjusts for the partial contribution of casual and part-time GPs, and the contribution of GPs who work more than the average full-time doctor does. In 2006–07, there were 18,091 FWE GPs in Australia.

Between 2002–03 and 2006–07, the number of FWE GPs in Australia increased by 7.9% from 16,772 to 18,091. The increase in rural and remote areas was 12.5% and in urban areas it was 6.4%. Over the same period the number of FWE GPs per 100,000 population increased marginally for Australia overall, from 84 to 86 (Figure 7.16).

The distribution of GPs has become less uneven across the broad regions in recent years. Between 2002–03 and 2006–07 the number of FWE GPs per 100,000 increased from 73.1 to 78.0 in rural and remote regions, but for urban areas the increase was much less, from 88.9 to 89.4.

Female GPs made up 37.4% of GPs who had at least one Medicare claim processed in 2005–06, but only 27.1% of GP workload as measured by FWE (Figure 7.17). This reflects the high rate of part-time and casual workforce participation among female doctors.

Further information on the supply of primary care practitioners and their age and sex distribution is in Chapter 8.

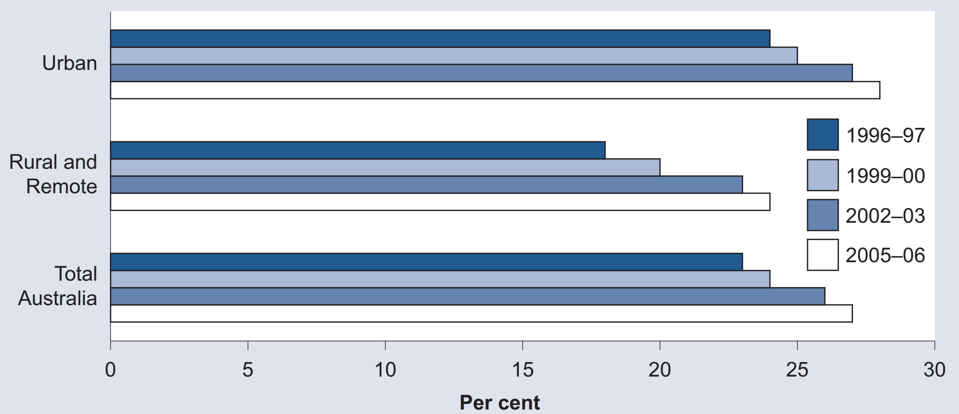


Notes

1. Refers to GPs and other medical practitioners for whom at least one Medicare service was processed during the year.
2. FWE is calculated by dividing each doctor's Medicare billing by the average billing of full-time doctors for the year. There is no cap on a doctor's FWE.
3. Location is based on the doctor's practice location at which most services were rendered at the last quarter within the reference period.
4. Urban areas consist of Capital City and Other Metropolitan Areas. Rural areas consist of Large Rural Centres, Small Rural Centres, Other Rural Areas, Remote Centres, Other Remote Areas and Other Areas.

Source: Australian Government Department of Health and Ageing unpublished data.

Figure 7.16: FWE GPs per 100,000 population, by grouped RRMA, 2002–03 to 2006–07



Notes

1. RRMA is Rural, Remote and Metropolitan Area.
2. Refers to GPs and other medical practitioners for whom at least one Medicare service was processed during the year.
3. FWE is calculated by dividing each doctor's Medicare billing by the average billing of full-time doctors for the year. There is no cap on a doctor's FWE.
4. Location is based on the doctor's practice location at which most services were rendered at the last quarter within the reference period.
5. Urban areas consist of capital city and other metropolitan areas. Rural areas consist of Large Rural Centres, Small Rural Centres, Other Rural Areas, Remote Centres, Other Remote Areas and Other Areas.

Source: Australian Government Department of Health and Ageing unpublished data.

Figure 7.17: FWE GPs by grouped RRMA, per cent female, 1996–97 to 2005–06

Potentially preventable hospitalisations *(NHPC indicator 3.07)*

Rates of potentially preventable hospitalisations (PPH) measure the effectiveness, timeliness and adequacy of various types of care in preventing hospital admissions for particular conditions. Those types include population health, primary care, and outpatient services. A high rate of potentially preventable hospitalisation may indicate an increased prevalence of the conditions in the community, poorer functioning of the non-hospital care system or an appropriate use of the hospital system to respond to greater need. It is important to note that the reported PPHs are not comprehensive—there are other hospital admissions which may be preventable as well. Note also that the relevance of PPHs goes beyond primary care and community health-care services, but estimates are placed in this section for convenience of presentation.

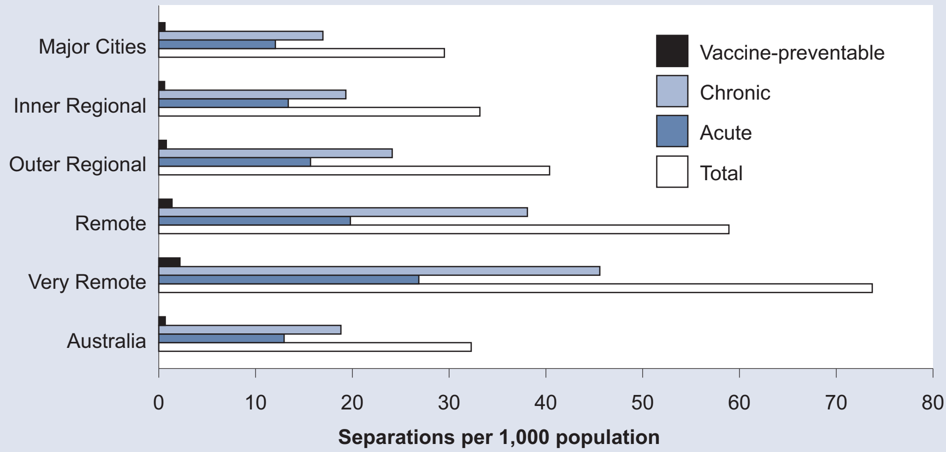
Three broad categories of PPHs are presented here—vaccine-preventable, chronic and acute. These categories have been sourced from the Victorian Ambulatory Care Sensitive Conditions study (DHS 2002).

There were over 676,000 hospital separations in 2005–06 that were identified as potentially preventable (AIHW 2007a). These included almost 14,000 separations for vaccine-preventable conditions (mainly influenza and pneumonia) and almost 266,000 separations for acute conditions (with the largest numbers for dental, dehydration/gastroenteritis, and kidney conditions). Chronic conditions accounted for over 400,000 separations, with diabetes complications (212,000) and chronic obstructive pulmonary disease (57,000) the conditions associated with the largest numbers of separations.

Separation rates for PPHs were highest in Very Remote regions, with rates almost 2.3 times the national average (Figure 7.18). Rates consistently dropped with decreased remoteness and were lowest in the Major Cities. Rates also varied between categories of socioeconomic status. Separation rates for PPHs in the most disadvantaged areas were 64% higher than those of the most advantaged areas (AIHW 2007a).

In a comparison between states and territories, rates for PPHs were lowest in the Australian Capital Territory and New South Wales (respectively, 32% and 13% below the national average) and highest in Western Australia and the Northern Territory (respectively, 46% and 48% higher than the national average). For the other states, the difference in rates from the national average was negligible (less than 1–2%)(AIHW 2007a).

There was little change in overall PPH rates during the 5-year period between 2001–02 and 2005–06 (Figure 7.19). There was little variation in vaccine-preventable rates (from 0.84 per 1,000 in 2001–02 down to 0.67 in 2005–06), and slight increases in the rates for both acute (up from 12.64 to 12.85) and chronic conditions (up from 17.35 to 18.62). Changes in the methods used over this period may affect the comparability of the data (Figure 7.19).

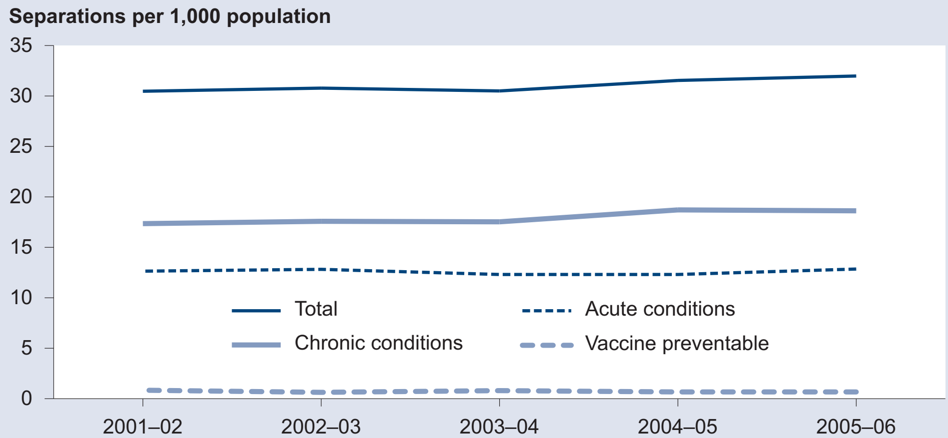


Notes

1. Separations for which the care type was reported as *Newborn* with no qualified days and records for *Hospital boarders* and *Posthumous organ procurement* have been excluded.
2. Separations per 1,000 population were age-standardised to the June 2001 Australian population.
3. Potentially preventable hospital separations—Vaccine-preventable conditions include influenza, bacterial pneumonia, tetanus, measles, mumps, rubella, pertussis and polio. Potentially preventable acute conditions include dental conditions, dehydration/gastroenteritis, ear, nose and throat infections, convulsions and epilepsy, cellulitis, kidney infections, pelvic inflammatory disease and appendicitis. Potentially preventable chronic conditions include diabetes complications, chronic obstructive pulmonary disease, angina, congestive heart failure, asthma, and iron deficiency anaemia.

Source: AIHW 2007a.

Figure 7.18: Separation rates for potentially preventable hospitalisations by broad categories, by remoteness area of usual residence, 2005–06



Notes

1. Separations for which the care type was reported as Newborn with no qualified days and records for *Hospital boarders* and *Posthumous organ procurement* have been excluded.
2. Separations per 1,000 population were age-standardised to the June 2001 Australian population.
3. See Figure 7.18 for list of conditions in each broad category.

Source: AIHW 2007a and earlier editions.

Figure 7.19: Separation rates for potentially preventable hospitalisations by broad categories, 2001–02 to 2005–06

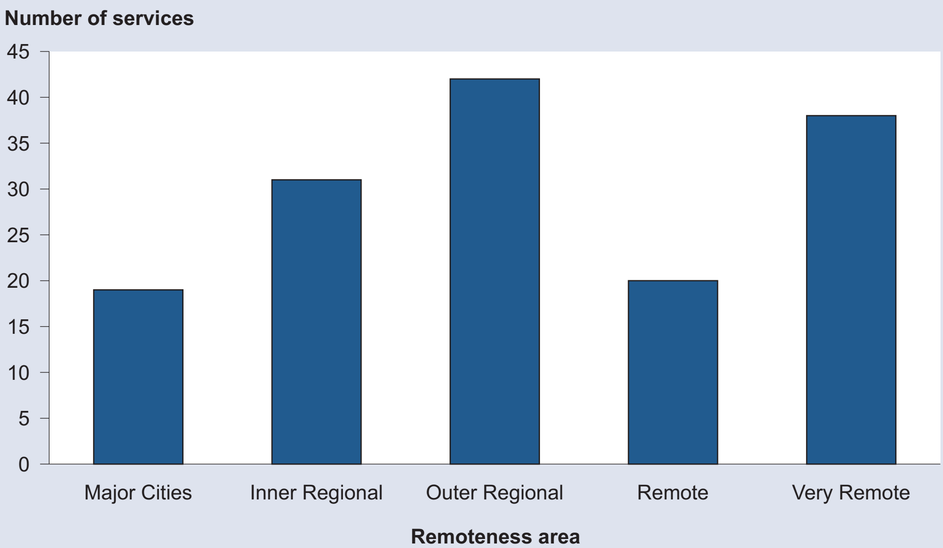
Primary health-care services for Aboriginal and Torres Strait Islander peoples

Chapter 3 of this report provides data on the health status of Aboriginal and Torres Strait Islander peoples, their hospitalisation rates and their use of GPs. The statistics demonstrate that Indigenous Australians tend to use these mainstream services differently from the rest of the Australian population. Health expenditure data (Chapter 8) reinforce this point.

For geographic, social and cultural reasons, mainstream services are not always accessible to, or are the most appropriate provider of health care for, Indigenous Australians. Australian governments recognise this and, given the relatively poor health status of Aboriginal and Torres Strait Islander peoples, provide specific health-care services to meet their needs.

Indigenous-specific health services are important providers of comprehensive primary health care. These services have funding provided by the Australian Government, state and territory governments, or both. The state and territory governments provide community-based Indigenous primary health-care services. The Australian Government, through the Office for Aboriginal and Torres Strait Islander Health (OATSIH), provides funding for a range of Indigenous-specific community controlled primary health-care services.

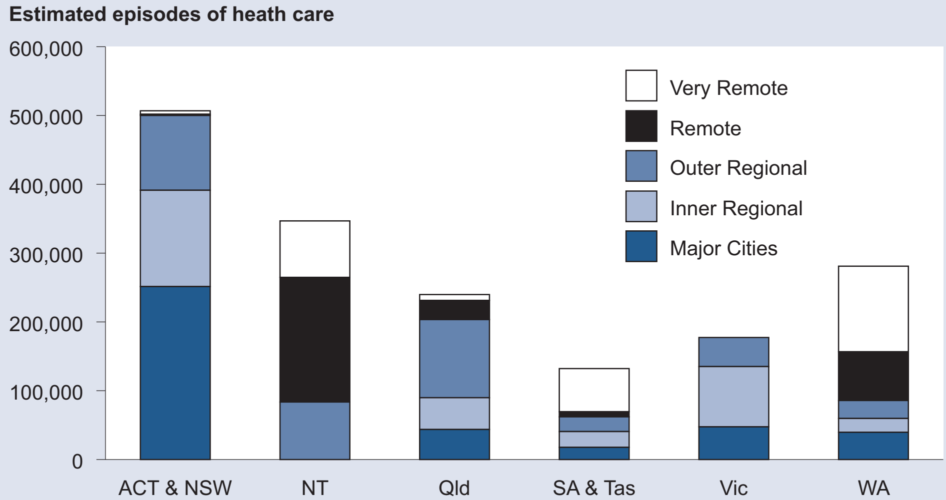
In 2005–06, OATSIH funded 151 services to provide or facilitate access to primary health care for Aboriginal and Torres Strait Islander peoples. Overall, 58 of these services (39%) were in Remote or Very Remote locations (Figure 7.20). These services offer many types of care, including management of acute and chronic health conditions, preventive health measures (such as immunisation and screening), health promotion activities, transport services and assistance in accessing other appropriate community and health services. A small number provide specific programs only, such as health promotion and counselling.



Source: Department of Health and Ageing, Service Activity Reporting 2005–06, unpublished data.

Figure 7.20: Geographical distribution of Australian Government-funded Aboriginal and Torres Strait Islander primary health-care services, 2005–06

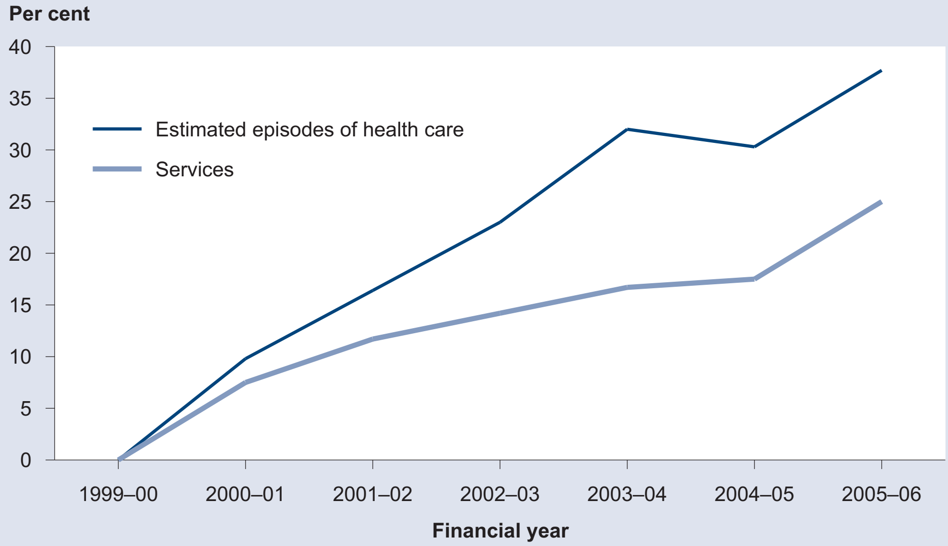
In 2005–06, an estimated 1.68 million episodes of health care were provided by Australian Government-funded Aboriginal and Torres Strait Islander primary health-care services. About 86% of these episodes of health care in 2005–06 were provided to Aboriginal and Torres Strait Islander clients. Total episodes of health care provided varied by state and territory and by remoteness. In 2005–06, the majority of episodes of health care reported for Western Australia, South Australia and the Northern Territory were provided in Remote and Very Remote areas of Australia, whereas for other jurisdictions the majority were provided in Major Cities, Inner Regional and Outer Regional areas (Figure 7.21).



Source: Department of Health and Ageing, Service Activity Reporting 2005–06, unpublished data.

Figure 7.21: Australian Government-funded Aboriginal and Torres Strait Islander community-controlled episodes of primary health care, by geographical region, 2005–06

There has been an increase in recent years in both the number of Aboriginal and Torres Strait Islander community-controlled primary health-care services and the episodes of health care provided. Over the period 1999–00 to 2005–06, there was around a 25% increase in the number of these services (from 120 to 151); and a 38% increase in the estimated episodes of health care provided to Indigenous and non-Indigenous clients (from 1.22 million to 1.68 million) (Figure 7.22).



Note: Includes data from all services which reported in any year over the period 1999–00 to 2005–06.
Source: Department of Health and Ageing, Service Activity Reporting, unpublished data.

Figure 7.22: Cumulative changes to Aboriginal and Torres Strait Islander community-controlled primary health-care services, 1999–00 to 2005–06

Dental services

There are no national administrative data on the use of dental services. Although most dental services are provided by private dental practitioners, there are some public providers such as school dental programs (often delivered by dental therapists) and public dental clinics.

Medicare data provide some information on dental services, particularly services for cleft lip and cleft palette which are eligible for Medicare funding. In 2006–07, there were about 5,100 orthodontic episodes, 440 oral surgery episodes and 1,800 general orthodontic and prosthodontic services billed to Medicare. Since November 2007, Medicare has funded dental services to provide for people with chronic medical conditions and complex care needs. In 2006–07, 7,500 dental care services were provided under these arrangements, with benefits of around $850,000 being paid through Medicare (Medicare Australia 2007).

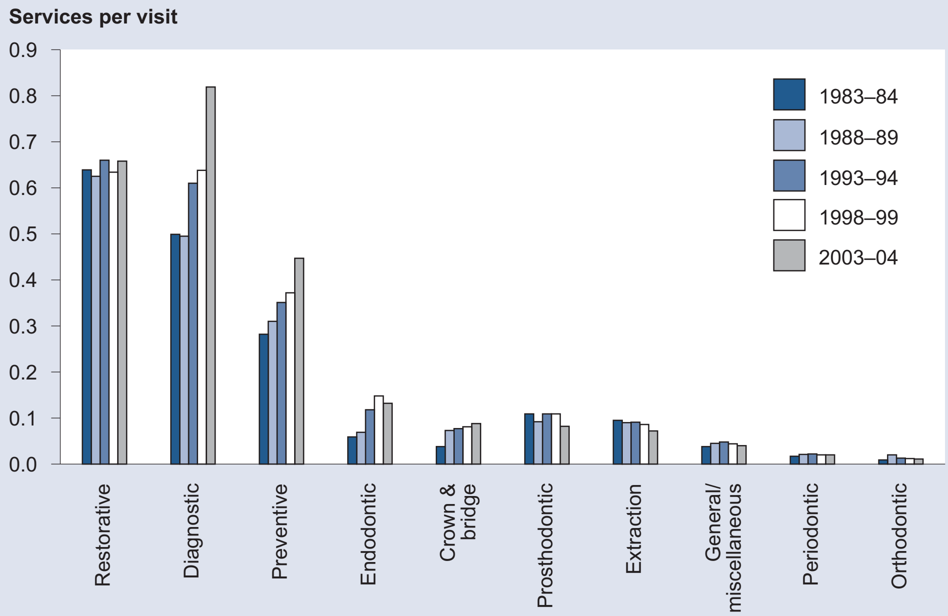
State and territory governments provide public dental services of some kind to primary and secondary school children. Disadvantaged adults are also provided general dental services and some specialist services are provided to adult holders of concession cards issued by Centrelink (SCRGSP 2008).

Services provided at dental visits

As noted above, there are no national administrative data available on dental service provision, but the Longitudinal Study of Dentists' Practice Activity (based on a random sample of dentists in Australia) is a source of information on dental services provided by private practitioners. This survey collected data at 5-year intervals between 1983–84 and 2003–04. The scope of the survey is registered dentists across all areas of all states and territories, with survey samples drawn from each state and territory dental register. The service data reported here were collected by dentists in service logs of typical clinical days. Dental care services provided by dental specialists and public dentists are not included.

Between 1983–84 and 2003–04, there was an increase in the average number of services per visit from 1.8 to 2.4. The rates of service provision per visit reflected increases in routine scheduled care such as diagnostic and preventive services, as well as interventions to maintain functional dentition such as endodontic (root canal) and crown and bridge services (Figure 7.23). Over that period, rates for prosthodontic (denture) and tooth extraction services declined, and periodontal (gum) services remained stable.

This observed shift towards diagnostic and preventive services reflects findings that, over time, there have been consistent decreases in tooth loss among the Australian population (Sanders et al. 2004), thereby increasing the pool of teeth potentially at risk of oral disease. At the same time, demographic trends point to increasing proportions of older adults in the population. These changes suggest a shift in dental practice towards treating adults who are increasingly retaining teeth into older age, often with complex treatment needs for maintaining their teeth and avoiding tooth loss.



Source: Longitudinal Study of Dentists' Practice Activity unpublished data.

Figure 7.23: Dental service provision per visit, 1983–84 to 2003–04

Allied health services

Allied health services are those services provided by licensed health professionals other than medical practitioners, such as pharmacists, physiotherapists, nurses, psychologists and dietitians. Note that the services described in this section may overlap with services described elsewhere in this chapter, because the allied health professionals may work in a range of settings such as hospitals and community health centres.

The 2004–05 National Health Survey asked respondents if they had consulted an allied health professional in the previous 2 weeks. The results suggested that in any 2-week period 1 in 10 Australians (2.0 million) consulted an allied health professional: 1 in 9 females (1.2 million) and 1 in 12 males (0.9 million). Four per cent of Australians (0.8 million) consulted a pharmacist, 2.1% (0.4 million) a physiotherapist/hydrotherapist, 1.2% (0.2 million) a nurse, and 0.9% (0.2 million) a chiropodist/podiatrist in any 2-week period (Table 7.11). Also, about 0.1 million people consulted an occupational therapist, speech therapist/pathologist, audiologist/audiometrist, Aboriginal health worker or alcohol and drug worker.

Table 7.11: Persons ('000) consulting allied health professionals[(a)], 2004–05

	Age group					Total		
Allied health professional	**0–14**	**15–24**	**25–44**	**45–64**	**65+**	**Males**	**Females**	**Persons**
Accredited counsellor	17.2	*11.6	28.8	*16.4	**	26.5	48.3	74.8
Pharmacist	115.6	93.1	276.4	188.5	92.0	272.7	492.8	765.5
Chiropodist/podiatrist	*4.9	*10.9	*13.2	53.1	95.8	62.8	115.2	178.0
Dietitian/nutritionist	**	*14.4	31.6	228.0	*8.5	25.5	53.0	78.5
Nurse	83.6	*13.4	56.2	41.1	49.5	98.2	145.6	243.8
Optician/optometrist	*15.6	21.3	38.3	61.2	51.9	79.5	109.1	188.6
Physiotherapist/hydrotherapist	20.9	49.7	147.2	142.4	75.9	214.8	221.3	436.1
Psychologist	*13.8	24.8	40.9	28.0	*5.9	57.7	55.7	113.5
Social worker/welfare officer	*10.5	*10.1	27.4	*12.7	*8.2	35.2	33.7	68.9
Other[(b)]	59.2	*11.2	31.0	22.6	39.4	93.0	70.6	163.5
Total[(c)]	**302.0**	**233.0**	**598.4**	**528.5**	**372.7**	**856.3**	**1,178.2**	**2,034.6**

* Estimate has a relative standard error of 25% to 50% and should be used with caution.

** Estimate has a relative standard error greater than 50% and is considered too unreliable for general use.

(a) Consultations in the 2 weeks before 2004–05 interview. Excludes consultations in/at hospitals or day clinics.

(b) Includes occupational therapist, speech therapist/pathologist, audiologist/audiometrist, Aboriginal health worker, and alcohol and drug worker.

(c) Totals will not necessarily be the sum of the rows, as some persons reported consultations with more than one type of professional.

Source: ABS unpublished data.

Medicare data can provide some information on use of private allied health services because, from 1 July 2004, Medicare rebates have been available for a maximum of five allied health services for eligible patients in a given year. Eligible patients are those with chronic conditions and complex care needs, provided that the treatment is part of a patient care plan drawn up by a GP. In 2006–07, about 930,000 allied health services were provided under these arrangements, with total benefits of around $44.3 million being paid through Medicare (Medicare Australia 2007).

Medicare also covers the cost of visits to optometrists. In 2006–07, there were 5.5 million optometry services provided, with $240 million in Medicare benefits being paid.

Most private health ancillary (or 'extras') insurance offers rebates for allied health services. In the quarter ending June 2007, there were benefits paid for about 1.86 million physiotherapy services, 1.45 million optical services, 504,000 chiropodist/podiatrist services, 90,000 speech therapy services and 88,000 psychologist/group therapy services (PHIAC 2007).

Community health services

Government-funded community health services in each state and territory provide a diverse range of health services not described elsewhere in this chapter. They are either provided directly by governments (including local governments) or funded by government and managed by local health services or community organisations (SCRGSP 2008). Community health services usually consist of multidisciplinary teams of salaried health professions who aim at improving the health of particular communities (Quality Improvement Council 1998). Community services are delivered in a variety of settings, including specially built community health centres, local council buildings, schools and clients' homes.

Statistical information on these services is not as highly developed as that on other services (such as hospitals) and there is no nationally agreed basis for describing the nature of the services or for measuring the amounts of service provided. Therefore, a comprehensive national picture of community health services is not available. However, some information on the nature of the services follows (SCRGSP 2008).

In 2006–07, the Australian Government funded community health services that included:

- the Regional Health Services program, which provided funds to rural communities of up to 5,000 people to support primary health-care services
- Rural Primary Health Projects, which included the National Rural Primary Health Projects Program that provided funding for primary care initiatives targeting remote regions.

States and territories provide a variety of community health services, including:

- maternal and child community health services—these include antenatal and postnatal parenting support services, early childhood nursing programs, disease prevention programs and treatment programs relating to child development and health
- women's health services that provide services and health promotion programs for females across a range of health-related areas
- men's health programs, including mainly promotional and educational programs
- community rehabilitation programs, including case management, prosthetics services and equipment schemes, and home modification.

Ambulance services and the Royal Flying Doctor Service

Ambulance services are provided by state and territory governments, except in Western Australia and the Northern Territory, which contract St John Ambulance Australia to provide the services.

The role of ambulance services generally includes providing emergency pre-hospital patient care and transport in response to sudden illness and injury, retrieving emergency patients, transporting patients between hospitals, conducting road accident rescues and coordinating patient services in multicasualty events. Some government ambulance services also provide first aid training courses, as do non-government providers such as St John Ambulance and the Red Cross.

In 2005–06, ambulance service organisations attended 2,719,000 incidents nationally, of which 1,057,000 (38.9%) were emergency incidents, 895,000 (32.9%) were non-emergency and a further 759,000 (27.9%) were urgent (SCRGSP 2008).

The numbers of incidents, responses and patients are interrelated: multiple responses/vehicles may be sent to a single incident, and there may be more than one patient per incident. There may also be responses to incidents that do not result in patients (that is, no one requires treatment). For every 100,000 Australians in 2006–07, there were 13,000 incidents, 15,000 responses and 13,000 patients. Between 2004–05 and 2005–06, there were increases of about 7% in all categories (SCRGSP 2008).

The Royal Flying Doctor Service (RFDS) provides aeromedical emergency health services, primary and community health care clinics at remote sites (for example, routine health checks and advice, immunisation, child health care, and dental, eye and ear clinics), telehealth consultations via radio, telephone or videoconference, pharmaceutical supplies at remote sites and transfers of patients between hospitals.

In 2006–07, there were 242,547 patient contacts with the RFDS. The service conducted 12,247 healthcare clinics, 75,439 telehealth services, and 35,089 aerial evacuations, including inter-hospital transfers. There were 47 aircraft used by the RFDS during 2006–07, which flew a total of 21.7 million kilometres. The RFDS had 21 bases (which house aircraft and provide health services), and six RFDS health facilities (which provide health services but do not house an aircraft)(RFDS 2007).

Complementary and alternative health services

Australians have access to a range of services that either complement or are alternative to mainstream health-care services. The 2004–05 National Health Survey asked respondents whether they had consulted an 'other health professional' in the 2 weeks before the interview. Results suggest that in any 2-week period, 1 in 28 Australians (0.7 million) consulted a complementary or alternative health professional: 1 in 23 females (0.5 million) and 1 in 37 males (0.3 million) (Table 7.12). About 1 in every 47 Australians (0.4 million) consulted a chiropractor, 0.1 million a naturopath and about 0.2 million an acupuncturist, herbalist, hypnotherapist or osteopath.

Table 7.12: Persons reporting consultations with complementary and alternative health professionals[(a)], 2004–05 ('000)

	Age group					Total		
Health professional	**0–14**	**15–24**	**25–44**	**45–64**	**65+**	**Males**	**Females**	**Persons**
Chiropractor	29.6	46.4	177.8	148.0	30.7	180.2	252.4	432.6
Naturopath	*13.0	*11.1	55.0	46.7	*7.9	35.6	97.9	133.6
Other[(b)]	*3.6	*14.2	82.3	76.4	24.8	68.5	132.7	201.2
Total[(c)]	**44.5**	**69.5**	**297.4**	**253.4**	**57.8**	**271.6**	**451.0**	**722.6**

* Estimate has a relative standard error of 25% to 50% and should be used with caution.

(a) Consultations in the 2 weeks before 2004–05 National Health Survey interview. Excludes consultations in/at hospitals or day clinics.

(b) Includes acupuncturist, herbalist, hypnotherapist and osteopath.

(c) Totals will not necessarily be the sum of the rows, as some persons reported more than one type of professional.

Source: ABS unpublished data.

A substudy on patient use of complementary and alternative therapies was conducted with the 2000–01 BEACH study of general practice consultations. Almost 22% of the substudy patients indicated that they used such therapies in the previous 12 months, and almost half said they would consider doing so in the future (Britt et al. 2007). Of those who had used complementary/alternative therapies in the previous 12 months, 40% had seen a chiropractor, 32% a naturopath, 23% had remedial massage and 20% had acupuncture.

Complementary and alternative health services have been incorporated into the general health-care system to a varying extent. For example, acupuncture performed by a medical practitioner attracts a Medicare rebate, for which a total of 589,796 claims were made in 2006–07, attracting benefits of $21.1 million.

Under the Medicare Allied Health Initiative, from 1 July 2004 Medicare benefits are paid for up to five services to eligible patients managed by a GP under an enhanced primary care plan. Included in the list of eligible allied health services are chiropractors and osteopaths. In 2006–07, about 38,000 chiropractic and 17,600 osteopath services were provided under these arrangements, with total Medicare benefits of around $1.7 million and $0.8 million, respectively.

Private health ancillary insurance sometimes covers some of these services, such as those provided by naturopaths, osteopaths, chiropractors and acupuncturists. In the quarter ending June 2007, benefits were paid for about 1.95 million chiropractic services, 556,000 natural therapy services, 359,000 acupuncture/acupressure services and 102,000 osteopathic services (PHIAC 2007).

7.3 Hospitals

Hospitals accounted for more than one-third of recurrent health expenditure (more than $31 billion) in Australia in 2005–06 and they generally attract the most media attention (AIHW 2007b). The hospital sector comprises more than 1,290 hospitals around Australia, with almost 82,000 beds available. The public hospital system employs the equivalent of more than 220,000 full-time staff, almost half are nurses and one-tenth are doctors.

Most hospital resources are consumed in providing care for the patients they admit, but hospitals provide a much higher number of non-admitted services, such as those provided by emergency departments and outpatient clinics (Box 7.9). On a typical day, around 20,000 Australians are admitted to a hospital, with about the same number leaving (separating), and there are about 124,000 non-admitted services.

The National Health Performance Framework includes nine areas in which to assess how well the health system is performing (NHPC 2004; see also chapters 1 and 9). For several of these areas there are indicators that relate to the performance of the acute care or hospital component of the health system. They include:

- the cost per casemix-adjusted separation (see below), as an indicator of efficiency
- waiting times for elective surgery, as an indicator of access
- emergency department waiting times, as an indicator of responsiveness
- hospital separations with an adverse event, as an indicator of safety.

The first three of these indicators are used for public acute hospitals and the last can apply to all hospitals.

Box 7.9: Terms and data sources relating to the use of hospitals

Admitted patients and the National Hospital Morbidity Database

Statistics on admitted patients are compiled when patients complete an 'episode of care' and are therefore considered to have 'separated'. An admitted patient is a patient who undergoes a hospital's formal admission process. The statistics are compiled at the end of the episode because that is when all the data pertaining to that episode of care (such as the length of stay and the procedures carried out) are known, and the diagnostic information is more accurate.

'Separation' is the term used to refer to the completion of an episode of admitted patient care. Such episodes can be a total hospital stay (from admission to discharge, transfer or death), or a portion of a hospital stay beginning or ending in a change of type of care (for example, from acute to rehabilitation). 'Separation' also means the process by which an admitted patient completes an episode of care by being discharged, dying, transferring to another hospital or changing type of care.

For each separation, patients are assigned a principal diagnosis, which describes the condition or its management considered the chief reason for the patient's episode of care. The principal diagnosis recorded for each separation is usually a disease, injury or poisoning, but can also be a specific treatment of an already diagnosed condition, such as dialysis for renal disease, or other reasons for hospitalisation. If applicable, procedures may also be reported. These can be described as surgical or non-surgical, and therapeutic or diagnostic. In 2005–06, diagnoses and procedures were reported using the fourth edition of the ICD-10-AM classification (Box 7.10). The term 'patient day' means the occupancy of a hospital bed (or chair in the case of some same-day patients) by an admitted patient for all or part of a day.

The state and territory health authorities compile information on patients admitted to hospitals and supply it to the AIHW for collation into the National Hospital Morbidity Database. This database is an electronic record for each separation from almost every hospital in Australia, including public acute and psychiatric hospitals (public sector), and private free-standing day hospital facilities and other private hospitals (private sector). Since 1993–94, data have been provided for all public hospital separations and, for most years, about 95% of private hospital separations.

As indicators of ill health in the population, hospital separations data have limitations. First, people who are attended to by the hospital but not admitted are not counted in the separations data. Also, the counting unit is the episode of care (the separation), not the patient. Further, the patient cannot be identified in the national database; so for example, one patient admitted five times cannot be distinguished from five patients admitted once each. Finally, hospital separations data are also affected by variations in admission practices, and in the availability of and access to hospitals and non-hospital services.

Non-admitted patients

Hospitals provide services to many patients without admitting them. These patients receive care through emergency departments, outpatient clinics and a range of other specialised services. Summary information on these services is collated nationally for public hospitals by the AIHW and for private hospitals by the Australian Bureau of Statistics (ABS).

(continued)

An 'occasion of service' for a non-admitted patient is defined as any examination, consultation, treatment or other service provided to a patient in each functional unit of a health service establishment, each time the service is provided. National data are categorised into broad clinic- or service-based groupings.

Definitions used for non-admitted patient hospital care are not completely uniform among the states and territories, and have varied over time. Existing national systems for counting and classifying this care are being revised with the aim of improving consistency and comparability. For example, the collection of more detailed data for non-admitted patient care for 23 outpatient clinic types began on 1 July 2005 in selected public hospitals.

Hospitals, bed numbers and public hospital costs

Nationally, the number of public acute care hospital numbers grew from 712 in 1995–96 to 736 in 2005–06. In contrast, over the same period, the number of private hospitals other than free-standing day hospital facilities decreased from 323 to 284 (Table 7.13). The number of private free-standing day hospital facilities, however, increased from 140 in 1995–96 to 252 in 2005–06. These free-standing facilities provide investigation and treatment services for admitted patients on a day-only basis.

The number of public psychiatric hospitals declined from 26 in 1995–96 to 22 in 1996–97 and has remained relatively stable since then. These hospitals are devoted mainly to the treatment and care of admitted patients with psychiatric, mental or behavioural disorders. Reforms under the National Mental Health Strategy meant that their role declined in the early to mid-1990s, with more services provided in acute care hospitals and community settings.

Bed numbers

An indicator of the availability of hospital services is numbers of hospital beds. However, the concept of an available bed is also becoming less important due to factors such as increasing same-day hospitalisations and provision of 'hospital in the home' care. Bed numbers in hospitals can also be affected by the range and types (casemix) of patients admitted to those hospitals. For example, differing proportions of beds may be required for specialist services and services that are more general.

In 2005–06, there were 81,818 available beds in Australia, with 54,601 beds in public acute hospitals and public psychiatric hospitals (Table 7.13). Between 1995–96 and 2005–06, there was a 3.2% decrease in available beds and an 11% reduction in available beds per 1,000 population. The latter change was not evenly distributed between the public and private sectors, with private sector beds per 1,000 population remaining stable during this period and the public sector rate decreasing by 18%.

Public acute hospitals can be described in terms of 'peer groups' (Table 7.15), which group hospitals together based on their volume of admitted patient activity and geographical location (AIHW 2007a). This peer grouping was developed to assist in the comparison of the average cost per separation and also illustrate some of the attributes of the state and territory hospital systems. For example, the peer grouping reveals variation in bed numbers—*Small acute hospitals* each had an average of 23 beds in 2005–06, while *Principal referral and Specialist women's and children's hospitals* averaged 338 beds nationally.

Table 7.13: Hospitals and available beds, 1995–96 to 2005–06

Measure/hospital sector	1995–96	1997–98	1999–00	2001–02	2003–04	2005–06
Hospitals						
Public acute	712	738	726	724	741	736
Public psychiatric	26	22	22	22	20	19
Total public	*738*	*760*	*748*	*746*	*761*	*755*
Private free-standing day hospital facilities	140	175	190	246	234	252
Private other[(a)]	323	317	312	314	291	284
Total private	*463*	*492*	*502*	*560*	*525*	*536*
Total	**1,201**	**1,252**	**1,250**	**1,306**	**1,286**	**1,291**
Available beds[(b)]						
Public acute	55,891	52,801	50,188	49,004	50,915	52,236
Public psychiatric	3,867	2,935	2,759	2,457	2,561	2,366
Total public	*59,758*	*55,736*	*52,947*	*51,461*	*53,475*	*54,601*
Private free-standing day hospital facilities	1,023	1,348	1,581	1,851	1,947	1,965
Private other[(a)]	22,757	23,019	23,665	25,556	24,642	25,252
Total private	*23,780*	*24,367*	*25,246*	*27,407*	*26,589*	*27,217*
Total	**83,538**	**80,103**	**78,193**	**78,868**	**80,064**	**81,818**
Available beds (per 1,000 population)[(b)]						
Public acute	3.1	2.8	2.6	2.5	2.6	2.6
Public psychiatric	0.2	0.2	0.1	0.1	0.1	0.1
Total public	*3.3*	*3.0*	*2.8*	*2.6*	*2.7*	*2.7*
Private free-standing day hospital facilities	0.1	0.1	0.1	0.1	0.1	0.1
Private other[(a)]	1.3	1.2	1.2	1.3	1.2	1.2
Total private	*1.3*	*1.3*	*1.3*	*1.4*	*1.3*	*1.3*
Total	**4.5**	**4.3**	**4.1**	**4.0**	**4.0**	**4.0**

(a) Includes private acute and private psychiatric hospitals.

(b) Average available beds through the course of the year where possible, otherwise available beds at 30 June.

Sources: AIHW 2007a and earlier editions.

State and territory variation

In 2005–06, the average number of public hospital beds per 1,000 population ranged from 2.2 in the Australian Capital Territory to 3.2 in South Australia. For the private sector, there was a range from 1.0 in New South Wales to 1.7 in Western Australia (Table 7.14). The ratio of public beds to private beds was 2.0 nationally, ranging from 1.4 in Tasmania and Western Australia to 2.8 in New South Wales.

Table 7.14: Available hospital beds per 1,000 population, 2005–06

Sector	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Public acute hospitals	2.7	2.4	2.4	2.4	2.9	2.5	2.2	2.8	2.6
Public psychiatric hospitals	0.2	0.0	0.1	0.1	0.2	0.2	0.0	0.0	0.1
Total public	*2.9*	*2.4*	*2.5*	*2.5*	*3.2*	*2.7*	*2.2*	*2.8*	*2.7*
Private free-standing day hospital facilities	0.1	0.1	0.1	0.1	0.1	n.a.	n.a.	n.a.	0.1
Other private hospitals[a]	0.9	1.2	1.5	1.6	1.4	n.a.	n.a.	n.a.	1.2
Total private	*1.0*	*1.3*	*1.6*	*1.7*	*1.5*	*n.a.*	*n.a.*	*n.a.*	*1.3*
Total available beds per 1,000 population	**3.9**	**3.7**	**4.1**	**4.2**	**4.6**	**n.a.**	**n.a.**	**n.a.**	**4.0**

n.a. Not available but included in totals.

(a) Includes private acute and private psychiatric hospitals.

Source: AIHW 2007a.

Costs of public hospital care *(NHPC indicator 3.14)*

The cost per casemix-adjusted separation is a measure of the average cost of providing care for admitted patients, adjusted for the relative complexity of the patients' conditions. It is calculated for selected public acute hospitals as the average recurrent expenditure for each admitted patient, adjusted by the resources expected to be used for the separation. As such it can be taken as a measure of the relative technical efficiency of hospitals. Casemix weightings are based on the Australian Refined Diagnosis Related Groups (AR-DRGs) (Box 7.10).

Nationally, the average cost per casemix-adjusted separation was $3,698 (Table 7.15), varying from $3,299 for South Australia to $4,250 for the Australian Capital Territory, and from $3,524 for *Medium hospitals* to $3,790 for *Small acute hospitals*.

In 2005–06, nursing staff costs accounted for 27% of the cost per casemix-adjusted separation, medical staff and VMOs 21%, other labour costs 20%, other recurrent expenditure 13%, medical supplies 9%, drug supplies 5% and superannuation 5%.

Table 7.15: Public hospital cost per casemix-adjusted separation, excluding depreciation[a], 2005–06

Peer group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Principal referral and Specialist women's and children's hospitals									
Number of hospitals[b]	28	17	17	4	5	3	1	2	77
Average beds per hospital	361	224	369	464	394	348	510	230	338
Average cost weight	1.12	0.99	1.07	1.12	1.08	1.06	1.02	0.77	1.05
Cost per casemix-adjusted separation ($)	3,919	3,619	3,665	3,634	3,346	3,951	n.p.	4,102	3,726
Large hospitals									
Number of hospitals[b]	14	9	6	5	2	0	1	0	37
Average beds per hospital	170	105	138	123	212	. .	194	. .	145
Average cost weight	1.05	0.85	0.86	0.82	1.15	. .	1.05	. .	0.94
Cost per casemix-adjusted separation ($)	3,710	3,702	3,024	3,706	3,420	. .	n.p.	. .	3,608

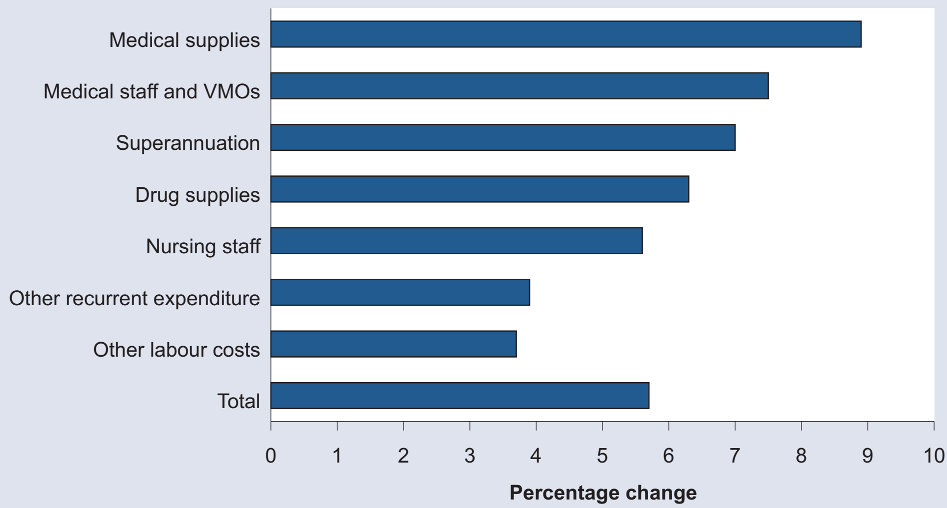
(continued)

Table 7.15 (continued): Public hospital cost per casemix-adjusted separation, excluding depreciation[(a)], 2005–06

Peer group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Medium hospitals									
Number of hospitals[(b)]	38	17	10	7	11	0	0	0	83
Average beds per hospital	62	47	62	82	59	. .	. .	. .	60
Average cost weight	0.89	0.74	0.78	0.84	0.79	. .	. .	. .	0.83
Cost per casemix-adjusted separation ($)	3,637	3,626	2,929	4,047	3,024	. .	. .	. .	3,524
Small acute hospitals									
Number of hospitals[(b)]	40	23	36	16	19	6	0	3	143
Average beds per hospital	25	19	23	21	25	14	. .	37	23
Average cost weight	0.79	0.74	0.76	0.80	0.81	0.85	. .	0.57	0.77
Cost per casemix-adjusted separation ($)	3,882	4,566	2,755	4,271	3,047	5,914	. .	4,810	3,790
Total selected public acute hospitals									
Number of hospitals[(b)]	120	66	69	32	37	9	2	5	340
Average beds per hospital	132	91	124	106	95	125	352	114	117
Average cost weight	1.07	0.95	1.01	1.00	1.01	1.06	1.03	0.73	1.01
Cost per casemix-adjusted separation ($)	3,852	3,646	3,537	3,733	3,299	3,994	4,250	4,187	3,698

n.p. Not published because there was only one hospital in the peer group.
. . Not applicable.
(a) For details of the methods used see AIHW 2007a.
(b) Hospital counts refer to facilities with available financial data. As a result, the numbers of hospitals and beds will be different from those reported in Table 7.13.

Source: AIHW 2007a.



Note: VMOs are visiting medical officers.

Source: AIHW 2007a and earlier editions.

Figure 7.24: Increases in components of average cost per casemix-adjusted separation, average annual change between 2000–01 and 2005–06

Between 2001–02 and 2005–06, the average cost per casemix-adjusted separation rose by 5.7% annually (in current prices—not adjusted for inflation)(Figure 7.24). The rate of cost increase was not equal across all components. For example, the average annual cost increase in medical supplies (8.9%) and medical staff and VMOs (7.5%) was higher than the cost increase overall, and growth in the categories of other recurrent expenditure (3.9%) and other labour costs (3.6%) was lower than the average overall cost increase.

Admitted patient care

In 2005–06, there were 7,311,983 separations in Australian hospitals, of which 4,466,076 were in public hospitals and 2,845,907 were in private hospitals. Between 1996–97 and 2005–06, separations from all hospitals increased by 37.3%. Separations increased by 22.8% in public acute hospitals and by 68.9% in private hospitals. Separations per 1,000 population increased by 6.4% for public acute hospitals and by 46.6% for private hospitals.

Between 1996–97 and 2005–06, the number of patient days in public acute hospitals increased by 7.2% and for private hospitals the increase was 25.8%. Over the same period, patient days per 1,000 population decreased by 10.5% for public acute hospitals and increased by 2.7% for private hospitals.

In 2005–06, about 4 million separations were for same-day care: 2.2 million from public acute hospitals, around 2,000 from public psychiatric hospitals and 1.8 million from private hospitals. The proportion of separations that are same-day increased from 44.7% in 1996–97 to 55.3% in 2005–06 (AIHW 2007a).

What are people being admitted for?

The conditions that hospitals treat are of interest to health service managers, planners, funders and researchers. These conditions, the procedures that patients undergo in hospital and the consequent casemix of hospitals are detailed in the National Hospital Morbidity Database using the classification systems described in Box 7.10. Regardless of the classification used, the consistent picture is that a large proportion of hospital separations are due to a relatively small number of conditions and treatments. These conditions and treatments include renal dialysis (for which patients typically have around 150 separations a year), chemotherapy (also involving multiple stays for each patient), gastrointestinal endoscopies (viewing the inside of the stomach, bowel, and so on), replacement of the eye's lens (usually because of cataracts), and childbirth (including caesarean sections). The reason for which people are being admitted are presented below as the diagnosis view, the procedures view and the AR-DRG view.

Box 7.10: Classification of diagnoses, procedures and separations for admitted patients

Diagnoses and procedures

Hospital patient records contain information about a patient's diagnosis and about procedures performed during the hospital stay. To allow efficient storage and analysis of this information, detailed classification and coding systems are used to describe and record diagnoses and procedures. In 2005–06, diagnoses and external causes of injury were recorded using the fourth edition of the *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification* (ICD-10-AM) (NCCH 2004). It comprises classifications of diseases and external causes of injuries and poisoning, based on the World Health Organization version of ICD-10. These ICD-10-AM codes can be a source of information on the diseases treated in hospitals and the operations performed, either at very detailed levels or combined into broad groupings.

Procedures were recorded using the *Australian Classification of Health Interventions* (ACHI) (NCCH 2004).

Diagnosis Related Groups

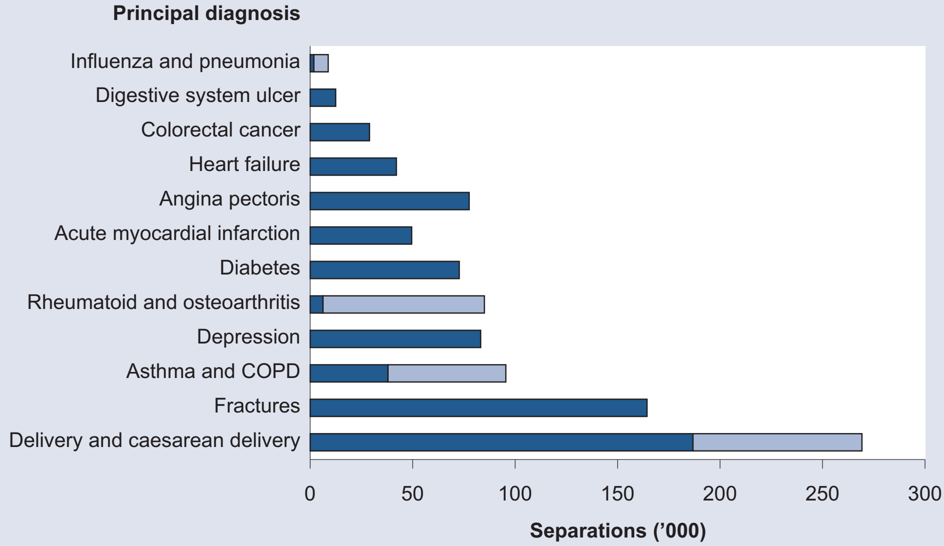
Australian Refined Diagnosis Related Groups (AR-DRGs) is a classification system used mainly for acute care admitted patient episodes. 'Acute' care applies to more than just emergency care and acute illnesses; it includes care and treatment for chronic conditions. The term distinguishes this type of care from other types, such as rehabilitation or palliative care. The AR-DRG classification provides a means of summarising and relating the number and type of acute admitted patients treated in a hospital (that is, its casemix) to the resources expected to be used in their treatment. This classification groups episodes with similar clinical conditions and similar use of hospital resources, using information in the hospital separation record such as diagnoses, procedures, and age of the patient. This grouping is first to broad Major Diagnostic Categories, then to 'surgical', 'medical' (care not involving surgery) and 'other' partitions, and then to the individual AR-DRGs. This report uses AR-DRG version 5.0 (DoHA 2002).

Each AR-DRG is associated with information on the average length of stay and estimated average cost for patients in the group in the public and private sectors. This classification therefore has use in measuring the outputs and performance of hospitals, and in planning and funding hospital service provision.

The diagnosis view of admitted patient care activity

Nearly 40% of all separations in Australian hospitals in 2005–06 had a principal diagnosis in five of the broad ICD-10-AM chapter groups (see Boxes 7.9 and 7.10). These were: *Diseases of the digestive system; Neoplasms; Pregnancy, childbirth and the puerperium; Injury, poisoning and certain other consequences of external causes;* and *Factors influencing health state and contact with health services* (including dialysis, chemotherapy and rehabilitation)(tables S28 and S29).

The National Health Priority Areas were represented in some high-volume diagnoses in 2005–06. There were around 95,000 separations with a principal diagnosis of *Asthma and chronic obstructive pulmonary disease*, 85,000 for *Rheumatoid arthritis and osteoarthritis*, and 42,000 for *Heart failure* (Figure 7.25). Also of high volume was childbirth—there were 82,000 separations for *Childbirth by caesarean section* and 187,000 for *Other delivery*.



Notes

1. Separations for which the care type was reported as *Newborn* with no qualified days and records for *Hospital boarders* and *Posthumous organ procurement* have been excluded.
2. Angina pectoris—chest pain.
3. Acute myocardial infarction—heart attack.
4. COPD—chronic obstructive pulmonary disease.
5. For bars with two values, the darker shading refers to the first part of the label.

Source: National Hospital Morbidity Database.

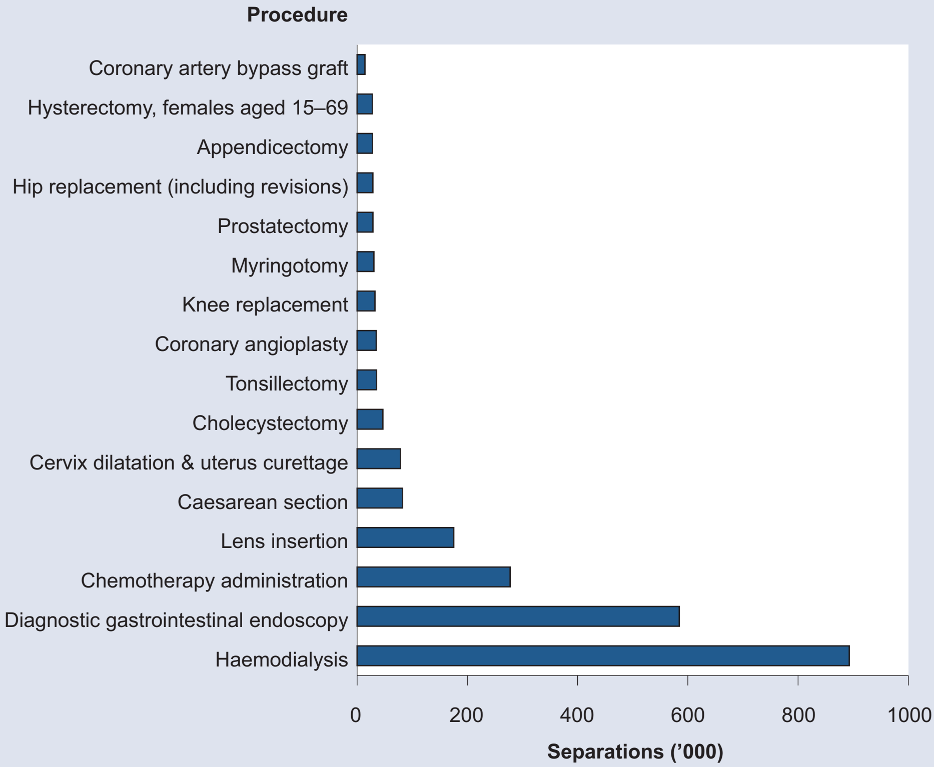
Figure 7.25: Separations for selected principal diagnoses, public and private hospitals combined, 2005–06

The procedures view of admitted patient care activity

Procedures are clinical interventions that are surgical in nature, carry a procedural or anaesthetic risk, require specialised training, and/or require special facilities or equipment available only in an acute care setting. Procedures are a very common part of hospital treatment, especially so for private hospitals. A procedure was reported for 81.5% of separations from Australian hospitals in 2005–06 (AIHW 2007a). Of these, 55.8% were from public hospitals, although public hospitals accounted for 61.1% of separations overall. Similarly, although 69.8% of overall patient days were in public hospitals, only 67.3% of patient days associated with procedures were in public hospitals. This reflects the higher proportion of separations in private hospitals (92.5%) that had a procedure, compared with public hospitals (74.5%).

At the broad ICD-10-AM chapter level, if miscellaneous diagnostic and therapeutic procedures are not included, *Procedures on the urinary system* accounted for the largest proportion of public hospital separations for which a procedure was reported (over 850,000 separations) (Table S32). *Haemodialysis* accounted for 85% (726,000) of those urinary system separations. The most commonly reported procedure group for the private sector was *Procedures on the digestive system* (599,000) (Table S33). Within that grouping, *Panendoscopy with excision* and *Fibreoptic colonoscopy with excision* were both reported for 28% of such separations.

Other commonly reported procedures across both sectors were *Diagnostic gastrointestinal endoscopy* (584,000 separations), *Chemotherapy administration* (278,000) and *Lens insertion* (175,000) (Figure 7.26).



Note: Separations for which the care type was reported as Newborn with no qualified days and records for *Hospital boarders* and *Posthumous organ procurement* have been excluded.

Source: National Hospital Morbidity Database.

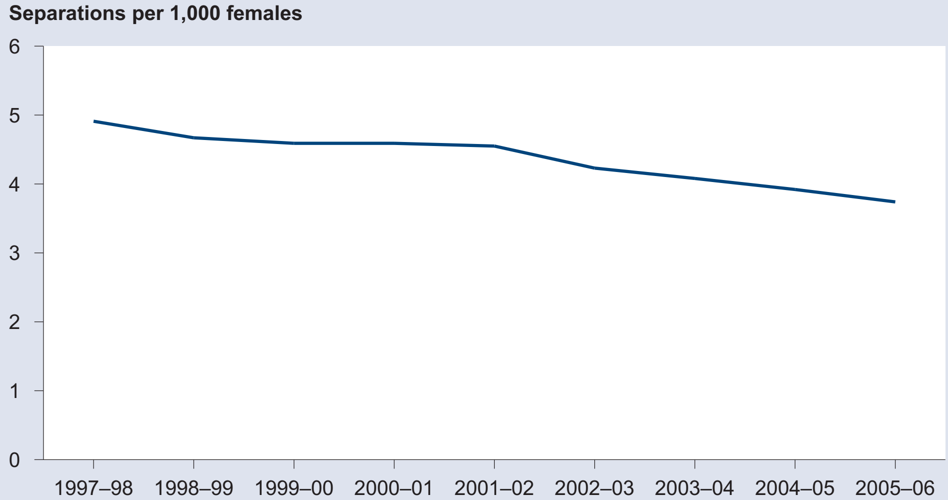
Figure 7.26: Separations for selected procedures, public and private acute hospitals combined, 2005–06

Hysterectomy rates *(NHPC indicator 3.13)*

Hysterectomy involves the partial or full removal of the uterus. It is one of the most common surgical procedures performed in Australian hospitals, accounting for over 27,500 procedures in 2005–06 (AIHW 2007a). The procedure is performed to treat a range of conditions including recurrent uterine bleeding, chronic pelvic pain, or menopause, usually in some combination. Hysterectomies can also be performed to treat genital cancer or in cases of trauma.

Overall, the rates in 2005–06:

- had declined by around 24% compared with 1997–98 (Figure 7.27)
- were significantly lower for females in the most advantaged socioeconomic areas (3.0 per 1,000 females aged 15–69 years compared with an overall rate of 3.79 per 1,000) (AIHW 2007a)
- varied between jurisdictions, with the highest rates reported for South Australia (4.6) and the lowest for Victoria (3.5).



Notes

1. Age-standardised to the June 2001 Australian population.
2. Separations for which the care type was reported as *Newborn* with no qualified days and records for *Hospital boarders* and *Posthumous organ procurement* have been excluded.
3. Hysterectomies are identified using the following ICD-10-AM codes: hysterectomy blocks [1268], [1269], codes 90450-00 and 90450-01. It is important to note that this analysis includes the following hysterectomies that other analyses such as studies by the US Agency for Healthcare Research and Quality exclude: (1) females undergoing hysterectomy for malignancy of the cervix, uterus, ovary and/or fallopian tube; and (2) females where the principal diagnosis is (a) lower abdominal trauma or (b) pregnancy, childbirth or puerperium.

Source: AIHW 2007a and earlier editions.

Figure 7.27: Hospital hysterectomy separation rate, females aged 15–69 years, 1997–98 to 2005–06

Several studies have shown that the variation in hysterectomy rates between regions cannot be explained by the underlying patterns of disease (AHRQ 2002). In 2005–06 there were 3.79 hysterectomies performed for every 1,000 Australian females aged 15–69 years (Figure 7.27). Rates were highest in Outer Regional (4.42) and Inner Regional (4.28) areas, and were slightly lower than the national average for Major Cities (3.59) and Remote areas (3.26)(Figure 7.28). Rates were lowest for the Very Remote regions (2.68).

Notes

1. Age-standardised to the June 2001 Australian population.
2. Separations for which the care type was reported as *Newborn* with no qualified days and records for *Hospital boarders* and *Posthumous organ procurement* have been excluded.
3. Hysterectomies are identified using the following ICD-10-AM codes: hysterectomy blocks [1268], [1269], codes 90450-00 and 90450-01. It is important to note that this analysis includes the following hysterectomies that other analyses such as studies by the US Agency for Healthcare Research and Quality exclude: (1) females undergoing hysterectomy for malignancy of the cervix, uterus, ovary and/or fallopian tube; and (2) females where the principal diagnosis is (a) lower abdominal trauma or (b) pregnancy, childbirth or puerperium.

Source: AIHW 2007a and earlier editions.

Figure 7.28: Hospital separations for hysterectomies, by remoteness area of usual residence, females aged 15–69 years, 2005–06

Adverse events *(NHPC indicator 3.21)*

Adverse events are defined as incidents involving harm to a person receiving health care. They include infections, falls and other injuries, and reactions or complications due to surgery, medication or medical devices, some of which may be preventable. Adverse events in health care may occur inside or outside hospitals, and can be the cause of hospitalisation as well. The former Australian Council for Safety and Quality in Health Care estimated that an adverse event is associated with about 10% of hospital separations in Australia and other developed countries (ACSQHC 2001). About 2% of separations have been estimated to be associated with serious adverse events causing major disability (1.7%) or death (0.3%) (Runciman et al. 2000).

Public and private sector hospital separations data can be used to indicate the occurrence of adverse events because they include information on ICD-10-AM diagnoses, places of occurrence and external causes of injury and poisoning that can indicate that an adverse event was treated and/or occurred during the hospitalisation. However, other ICD-10-AM codes may also suggest that an adverse event has occurred, and some adverse events are not identifiable using these codes. The data presented below can be interpreted as representing selected adverse events in health care that have resulted in, or have affected, hospital admissions, rather than all adverse events that occurred in hospitals.

In 2005–06, there were over 353,000 separations with an ICD-10-AM code for an adverse event—or 4.8 per 100 separations—comprising 247,000 separations in the public sector (5.5 per 100 separations) and 106,000 separations in the private sector (3.7 per 100 separations) (Table 7.16). The data for public hospitals are not comparable with those for private hospitals because their casemix and recording practices may be different.

Procedures causing abnormal reactions/complications were reported for 223,000 separations, 96,000 separations included a report of *Adverse effects of drugs, medicaments and biological substances* and 71,000 separations were reported with *Complications of internal prosthetic devices, implants and grafts*.

Table 7.16: Hospital separations[(a)] with an adverse event, by hospital sector[(b)], 2005–06

	Public hospitals		Private hospitals		All hospitals	
Adverse event	Separations with adverse events	Adverse event separations per 100 separations	Separations with adverse events	Adverse event separations per 100 separations	Separations with adverse events	Adverse event separations per 100 separations
External cause codes						
Adverse effects of drugs, medicaments and biological substances	77,040	1.7	19,395	0.7	96,435	1.3
Misadventures to patients during surgical and medical care	8,588	0.2	3,546	0.1	12,134	0.2
Procedures causing abnormal reactions/complications	145,760	3.3	77,381	2.7	223,141	3.1
Other external causes of adverse events	5,472	0.1	900	0.0	6,372	0.1
Place of occurrence code						
Health service area	224,777	5.0	99,925	3.5	324,702	4.4
Diagnosis codes						
Selected post-procedural disorders	40,256	0.9	23,060	0.8	63,316	0.9
Haemorrhage and haematoma complicating a procedure nec	21,177	0.5	12,673	0.4	33,850	0.5
Infection following a procedure nec	21,653	0.5	9,986	0.4	31,639	0.4
Complications of internal prosthetic devices, implants and grafts	46,127	1.0	24,915	0.9	71,042	1.0
Other diagnoses of complications of medical and surgical care	35,470	0.8	14,375	0.5	49,845	0.7
Total[(c)]	**246,524**	**5.5**	**106,439**	**3.7**	**352,963**	**4.8**

nec Not elsewhere classified.

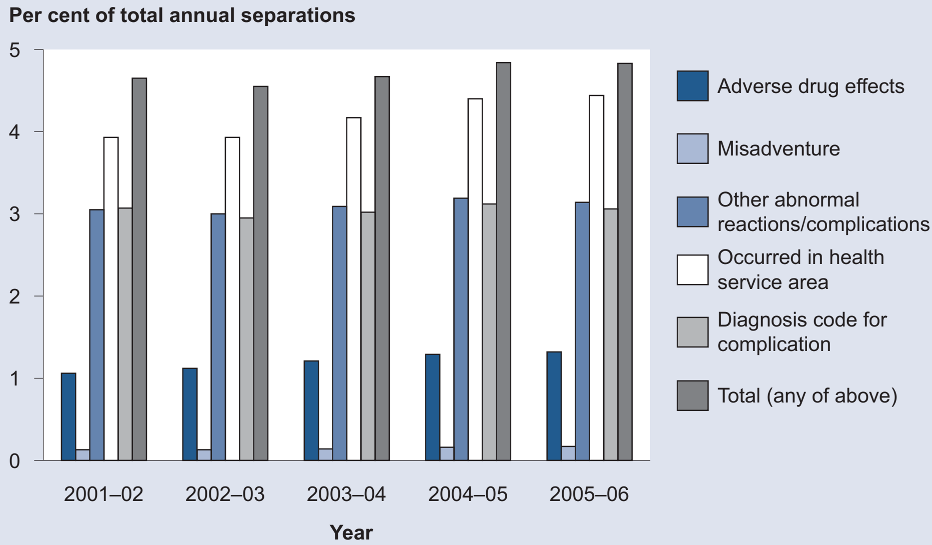
(a) Separations for which the care type was reported as *Newborn* with no qualified days, and records for *Hospital boarders* and *Posthumous organ procurement* have been excluded.

(b) The data for public hospitals are not comparable with the data for private hospitals because their casemixes differ and recording practices may also differ.

(c) Categories do not add to the totals because multiple diagnoses and external causes can be recorded for each separation and external cause codes and diagnosis codes can be used together to describe an adverse event.

Source: AIHW 2007a.

Between 2001–02 and 2005–06, the proportion of separations with an ICD-10-AM code for an adverse event remained relatively stable (Figure 7.29), with the number of separations reporting *Adverse effects of drugs, medicaments and biological substances* increasing from 1.1 to 1.3 per 100 separations. Over the same period the reporting of *Health service area* as the place of occurrence (of injury or poisoning) increased from 3.9 to 4.4 per 100 separations. However, these increases may reflect improvements in the documentation of adverse events rather than an increase in these events.



Notes

1. Separations for which the care type was reported as *Newborn* with no qualified days and records for *Hospital boarders* and *Posthumous organ procurement* have been excluded.
2. ICD-10-AM codes used are:

   Adverse drug effects:Y40–Y59 *Adverse effects of drugs, medicaments and biological substances*.

   Misadventure:Y60–Y82 *Misadventures to patients during medical or surgical care*.

   Other abnormal reaction/complication: Y83–Y84 *Procedures causing abnormal reactions/complications*.

   Occurred in health service area: Y92.22 *Health service area*.

   Diagnosis code for complication: E89, G97, H59, H95, I97, J95, K91, M96, N99, T80–T88, T98.3.
3. Categories do not add to the totals because multiple diagnoses and external causes can be recorded for each separation and external cause codes and diagnosis codes can be used together to describe an adverse event.

Source: National Hospital Morbidity Database unpublished data.

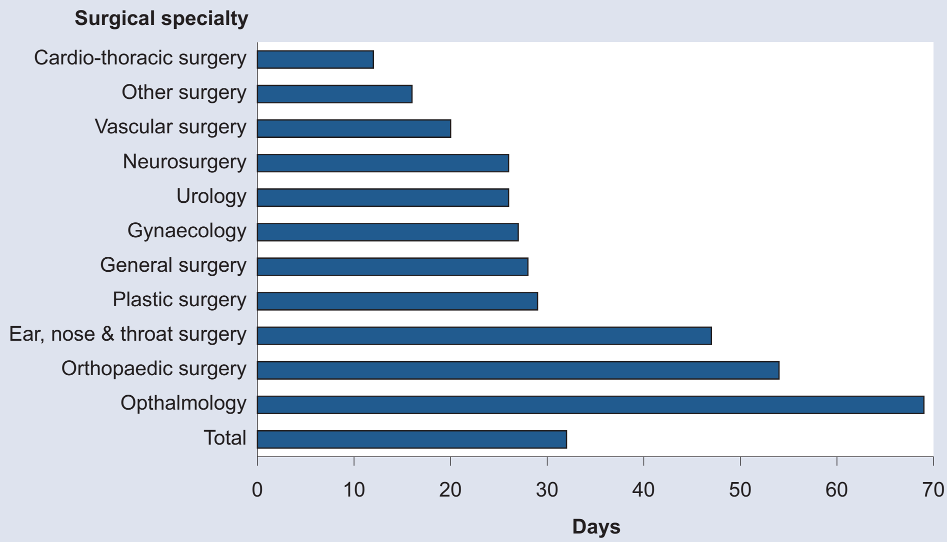
Figure 7.29: Proportion of separations with an adverse event reported, by type of adverse event, all hospitals, 2001–02 to 2005–06

Elective surgery waiting times

Waiting times for elective surgery are indicators of access to public hospital services; that is, they are an indicator of the provision of timely care according to need. The performance measure focuses on the length of time waited, rather than the size of the waiting list. This is because the size of a waiting list is not a reliable indicator of the time that patients wait for surgery unless it is considered in combination with other factors, such as the rate of removals for elective surgery.

In 2005–06, the AIHW National Elective Surgery Waiting Times Data Collection included data for an estimated 87% of public hospital elective surgery admissions (AIHW 2007a). Data were not available for smaller hospitals in several states; these hospitals may not have performed elective surgery, may not have had waiting lists or may have had different waiting list characteristics compared with reporting hospitals. Although the Elective Surgery Waiting Times data in full are reported using clinical urgency categories, the AIHW does not report waiting times using those categories. This is because the data are not comparable between states and territories, due to differing structural arrangements and urgency categorisation practices.

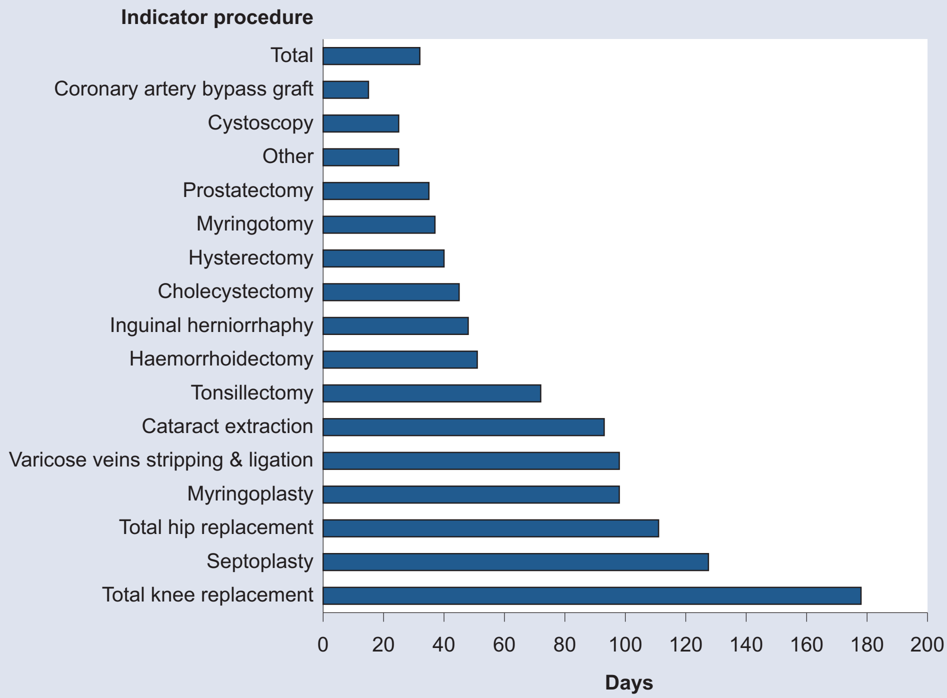
Overall, the median waiting time for elective surgery has shown a steady pattern of increase from 27 days in 2001–02 to 32 days in 2005–06 (AIHW 2007a). *Ophthalmology* and *Orthopaedic surgery* were the surgical specialties with the longest median waiting times in 2005–06 (69 and 54 days respectively). All other surgical specialties except *Ear, nose and throat surgery* had median waiting times of less than 30 days; and *Cardio-thoracic surgery* had the shortest median waiting time (12 days)(Figure 7.30).



Source: AIHW 2007a.

Figure 7.30: Median waiting times, by surgical specialty, 2005–06

Another view of the waiting times is through indicator procedures, which are high-volume procedures sometimes associated with long waits. *Total knee replacement* was the indicator procedure with the longest median waiting time in 2005–06, at 178 days. The indicator procedure with the lowest median waiting time in 2005–06 was *Coronary artery bypass graft,* at 15 days (Figure 7.31).



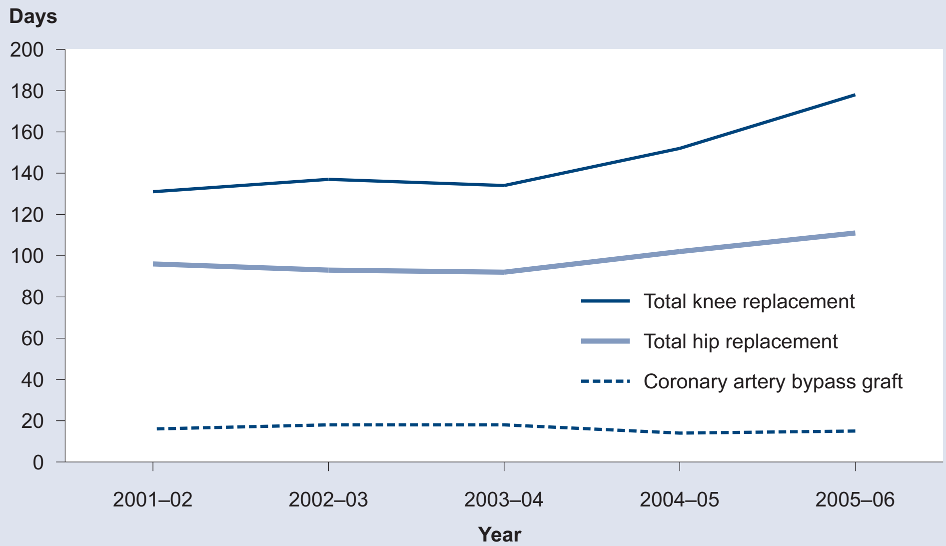
Source: AIHW 2007a.

Figure 7.31: Median waiting times, by indicator procedure, 2005–06

Access to elective surgery (*NHPC indicator 3.19*)

As an indication of potential differences in access to elective surgery, separation rates for surgical procedures and elective surgery waiting times for those procedures can be examined. This indicator tracks median waiting times and separation rates for three surgical procedures in public hospitals: *Coronary artery bypass graft, Total hip replacement* and *Total knee replacement.*

From 2001–02 to 2005–06, elective surgery admissions for *Coronary artery bypass graft* per 100,000 population decreased by almost 20% (from 30.4 to 24.6), and elective surgery median waiting times for the procedure decreased by over 6% (from 16 to 15 days) (AIHW 2007a, Figure 7.32). For *Total hip replacement*, elective surgery separation rates increased by almost 21% (from 30.3 to 36.6 per 100,000 population) and the median waiting time increased by almost 16% (from 96 to 111 days). For *Total knee replacement,* elective surgery admissions increased by almost 43% (from 36.7 to 52.4 per 100,000), while the median elective surgery waiting time increased by almost 36% (from 131 to 178 days).



Source: AIHW 2007a.

Figure 7.32: Median waiting times for selected elective surgery indicator procedures, public hospitals, 2001–02 to 2005–06

The AR-DRGs view of hospital activity

The AR-DRG classification takes into account diagnoses, procedures, length of stay and other patient factors to create groups of similar conditions and/or similar expected resource use. It provides a composite view of hospitalisations and is useful for describing the overall nature of the care received in hospital.

In 2005–06, 73.1% of acute hospital separations in the public sector were for medical (that is, non-surgical) AR-DRGs (3.2 million), compared with 38.4% in the private sector (1.1 million). In contrast there was a larger proportion of separations for surgical AR-DRGs in the private sector (40.9%) than in the public sector (20.3%)(see also tables S34 and S35).

In public hospitals, separations with medical AR-DRGs increased by 16.5% between 2001–02 and 2005–06, those with surgical AR-DRGs increased by 6.3% and other AR-DRGs increased by less than 0.1%. In private hospitals, separations with medical AR-DRGs also increased over that period, by 22.8%, and those with surgical and other AR-DRGs increased by 12.6% and 11.4% respectively. Thus, in 2005–06 the number of surgical separations from private hospitals (1.1 million) exceeded those from public hospitals (0.9 million).

The AR-DRGs with the highest numbers of separations in 2005–06 featured several for which same-day separations dominated (Table 7.17). Among these were the top two groups in public hospitals, *Admit for renal dialysis* (726,000 public sector separations) and *Chemotherapy* (131,000 separations). *Chemotherapy* topped the list in the private sector (160,000 separations), followed by *Admit for renal dialysis* (153,000). *Vaginal delivery without complicating diagnosis* was the most common AR-DRG that was usually not a same-day hospitalisation. This group was the third most common in public hospitals (97,000 separations) and the fifteenth most common in private hospitals (36,000).

Table 7.17: Top 12 AR-DRGs version 5.0 with the highest number of separations from public and private hospitals, 2005–06[(a)]

AR-DRG		Separations	Same-day separations (%)	Patient days	ALOS (days)
L61Z	Admit for renal dialysis	879,382	99.9	879,706	1.0
R63Z	Chemotherapy	291,354	99.9	291,563	1.0
G44C	Other colonoscopy, same-day	194,990	100.0	194,990	1.0
C16B	Lens procedures, same-day	161,497	100.0	161,497	1.0
G45B	Other gastroscopy for non-major digestive disease, same-day	141,094	100.0	141,094	1.0
O60B	Vaginal delivery without catastrophic or severe complications or co-morbidities	132,292	2.0	435,521	3.3
D40Z	Dental extractions and restorations	108,950	96.3	111,081	1.0
U60Z	Mental health treatment, same-day, without electroconvulsive therapy	97,016	100.0	97,016	1.0
Z64B	Other factors influencing health status, same-day	96,500	100.0	96,500	1.0
G46C	Complex gastroscopy, same-day	94,375	100.0	94,375	1.0
J11Z	Other skin, subcutaneous tissue and breast procedures	88,960	91.7	101,787	1.1
F74Z	Chest pain	87,811	38.1	136,008	1.5

(a) Includes separations for which the care type was reported as *Acute*, or as *Newborn* with qualified patient days, or was *Not reported.*

Source: AIHW National Hospital Morbidity Database.

Length of stay in hospital *(NHPC indicator 3.15)*

Although some categories of patients (such as those requiring rehabilitation, some specialised mental health services or palliative care) can have relatively long stays in hospital, most patients are admitted for acute care services and require a relatively short stay. There is an increasing trend towards day surgery and procedures for these acute care patients, with improvements in medical technology (keyhole surgery, for example) enabling a wider range of procedures to be performed on a same-day basis. Improved drug treatments and efforts to increase hospital productivity have also tended to result in shorter lengths of stay. Some treatments that have previously been undertaken during short-stay admissions are not now included in these data as they are being delivered in non-admitted settings.

With public psychiatric hospitals excluded, the average length of stay was 3.2 days overall in 2005–06—3.7 days in public acute hospitals and 2.6 in private hospitals. Excluding same-day separations, however, the average length of stay was 6.3 days in public acute hospitals and 5.4 in private hospitals.

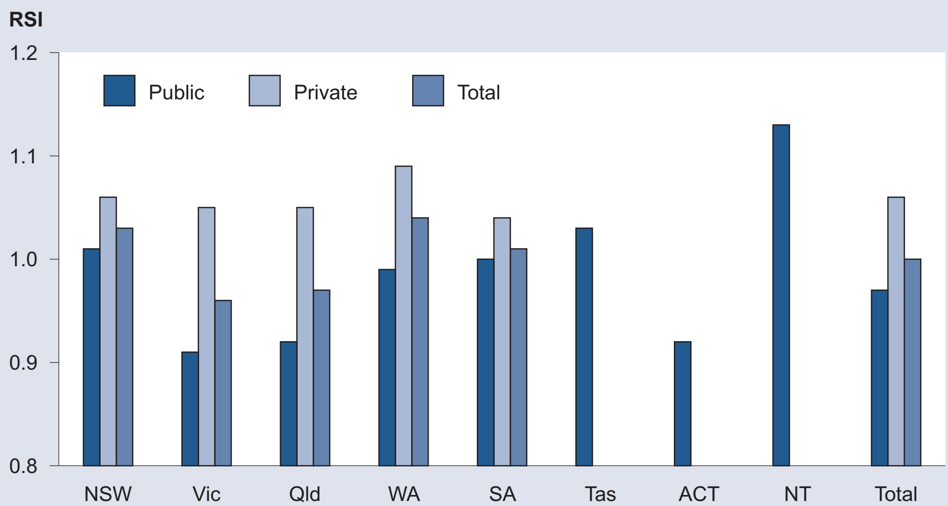
The difference between public and private hospitals at least partly reflects the different range of patients cared for and treatments undertaken (together known as casemix) in the two hospital sectors. For example, public hospitals had more children under the age of 5 years as patients (5.7% of separations), compared with private hospitals (1.8% of separations) (tables S28 and S29). There were also differences in the socioeconomic status of the patients' residential areas, in the proportion of separations for which procedures were reported, and in the average number of procedures reported per separation.

If same-day separations are included, the average length of stay in hospital declined from 3.6 days in 2001–02 to 3.3 in 2005–06. If those same-day separations are excluded, the average length of stay still fell over the period from 6.5 days to 6.2. This partly reflects the steady upward trend in the proportion of separations that were day-only. In 2001–02, 52.3% of separations were same-day, but by 2005–06 this had increased to 55.3% (Table 7.13).

The average length of hospital stay per separation is a measure of the efficiency of acute care hospitals. However, because hospitals and jurisdictions vary in terms of their casemix, it is appropriate to adjust length of stay measures to account for casemix.

The relative stay index (RSI) compares the actual length of stay in a hospital with the expected length of stay. If the RSI of an average stay is more than 1.00 the stay is longer than expected and if it is less than 1.00 it is shorter than expected. The RSIs presented here are calculated using the direct standardisation method. This method uses AR-DRGs (Box 7.10) to adjust the casemix of the jurisdiction or hospital sector to the national casemix (which then has a value of 1.00, by definition), allowing values to be directly comparable. For all hospitals, the directly standardised RSI decreased from 1.02 in 2001–02 to 0.97 in 2005–06 (AIHW 2007a).

There were variations between jurisdictions and between the public and private sectors in the RSIs for 2005–06 (Figure 7.33). For public hospitals the RSI was 0.97 in 2005–06 (shorter stay than expected) and 1.06 for private hospitals (longer stay than expected). In the public sector, the Northern Territory (1.13) had the highest RSI, followed by Tasmania (1.03) and NSW (1.01).



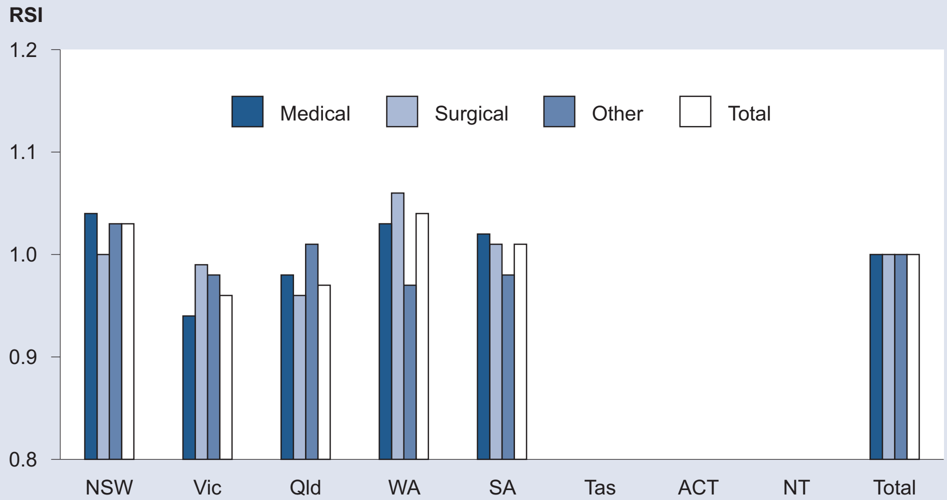
Notes

1. Relative stay index is based on separations for which the care type was reported as Acute, or as Newborn with qualified patient days, or was Not reported, using AR-DRG 5.0.
2. Relative stay indexes for private hospitals in Tasmania, Australian Capital Territory and Northern Territory are not published.

Source: AIHW 2007a.

Figure 7.33: Relative stay index, private and public hospitals, by state and territory, 2005–06

For surgical separations, the RSI was 1.02 for public hospitals and 0.98 for private hospitals. Within the public sector, Queensland had the lowest RSI for surgical separations at 0.97. For medical separations, the RSI was 0.95 for public hospitals and 1.18 for private hospitals. Within the public sector, Victoria had the lowest RSI for medical separations at 0.88 (Figure 7.34).



Notes

1. Relative stay index is based on separations for which the care type was reported as Acute, or as Newborn with qualified patient days, or was Not reported, using AR-DRG 5.0.
2. Relative stay index for hospitals in Tasmania, Australian Capital Territory and Northern Territory are not published.

Source: AIHW National Hospital Morbidity Database.

Figure 7.34: Relative stay index, by type of separation, by state and territory, 2005–06

Accident and emergency services

Non-admitted services are also provided through public and private hospital emergency departments. In 2005–06 there were 6.3 million accident and emergency occasions of service provided in public hospitals (Table 7.18). Private hospitals reported 451,000 accident and emergency occasions of service in 2004–05 (ABS 2005).

Geographic variation in the use of accident and emergency services

The ratio of services provided in an area to the number of residents there is an approximation of population use, although services provided in one area may be used by persons residing in others.

In terms of public hospital accident and emergency services in 2005–06, nationally the ratio varied from 256 occasions of service per 1,000 people in Major Cities to 385 in Regional areas and 854 in Remote areas (Table 7.18). This variation may reflect a number of factors, including the availability of other health-care services, patterns of disease and injury, and the generally poorer health of Aboriginal and Torres Strait Islander peoples, who have higher population concentrations in remote areas.

In contrast with public hospitals, there are fewer accident and emergency non-admitted patient occasions of service per 1,000 population for private hospitals in regional and remote areas than in Major Cities. In 2003–04, the ratio of services provided to the population resident in the area ranged from 27 occasions of service per 1,000 people in Major Cities to 19 per 1,000 people in regional areas and 8 per 1,000 people in remote areas (ABS 2005).

Table 7.18: Accident and emergency occasions of service in public acute hospitals, 2005–06

	NSW	Vic[(a)]	Qld	WA	SA	Tas	ACT	NT	Total
					Services ('000)				
Major Cities	1,251	936	514	300	339	. .	100	. .	3,440
Inner Regional	640	359	361	60	51	71	. .	. .	1,542
Outer Regional	207	114	301	114	69	58	. .	52	915
Total Regional	*848*	*472*	*662*	*174*	*121*	*129*	. .	*52*	*2,457*
Remote	28	n.a.	79	88	25	4	. .	46	270
Very Remote	11	. .	49	66	12	1	. .	22	161
Total Remote	*39*	*n.a.*	*128*	*154*	*36*	*5*	. .	*68*	*431*
Total	**2,137**	**1,409**	**1,304**	**629**	**496**	**134**	**100**	**120**	**6,328**
					Services per 1,000 population resident in area[(b)]				
Major Cities	258	255	245	212	306	. .	306	. .	256
Inner Regional	458	332	345	222	258	228	. .	. .	358
Outer Regional	428	441	436	613	390	353	. .	464	442
Total Regional	*450*	*353*	*381*	*382*	*320*	*271*	. .	*464*	*385*
Remote	737	n.a.	838	983	530	496	. .	1,087	830
Very Remote	1,378	. .	917	1,315	880	471	. .	442	897
Total Remote	*846*	*n.a.*	*866*	*1,103*	*609*	*490*	. .	*739*	*854*
Total	**316**	**280**	**328**	**313**	**322**	**276**	**306**	**588**	**311**

. . Not applicable.

(a) In Victoria, it is not possible to separately identify emergency occasions of service in hospital campuses located in remote areas.

(b) The ratio of services provided in the area to the number of residents in the area only approximates population use because services provided in an area may be provided to persons residing in other remoteness area categories.

Source: AIHW 2007a.

Age and sex distribution

For 2005–06, data on the patient's age group and sex were available for over 4.9 million emergency department occasions of service in public hospitals (about 78% of all emergency department occasions of service), mostly in hospitals classified as *Principal referral and Specialist women's and children's hospitals* and *Large hospitals* (AIHW 2007a). About 52% of all emergency department occasions of service were for male patients, and there were more male patients than female patients for all age groups except for those aged 75 years and over (Figure 7.35). The use of emergency departments was highest in the 15–24 and 25–34 years age groups, and is different from the use of admitted patient care, which rises with age.

Source: AIHW 2007a.

Figure 7.35: Emergency department occasions of service, 2005–06

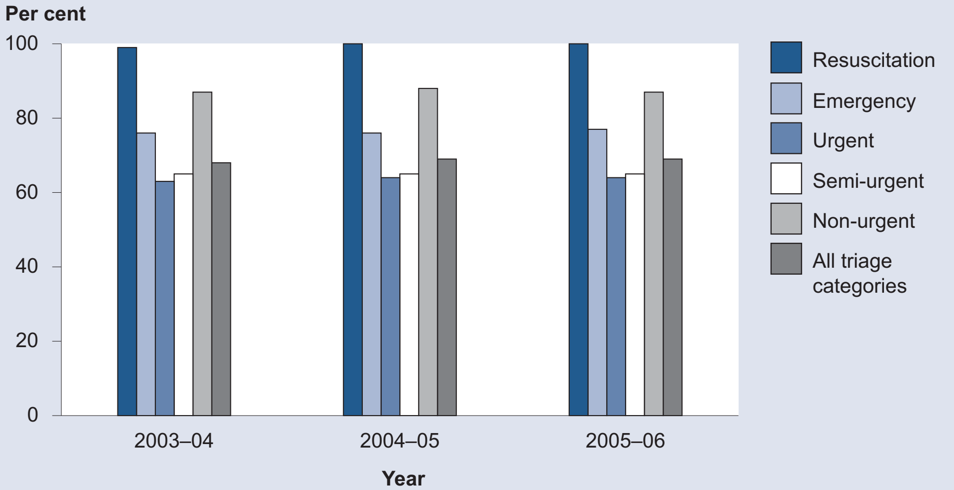
Emergency department waiting times *(NHPC indicator 3.16)*

Emergency department waiting times in public hospitals are regarded as indicators of responsiveness of the acute care sector (NHPC 2004). This information is summarised as the proportions of patients who are treated within a time appropriate for the urgency of their condition, and is presented for selected public hospital emergency departments.

The urgency of the patient's need for medical and nursing care is indicated by a triage category. When patients present to the emergency department a triage nurse promptly assesses their overall condition and assigns them to one of five categories which indicate how soon they should receive care:

- Resuscitation: immediate (within seconds)
- Emergency: within 10 minutes
- Urgent: within 30 minutes
- Semi-urgent: within 60 minutes
- Non-urgent: within 120 minutes.

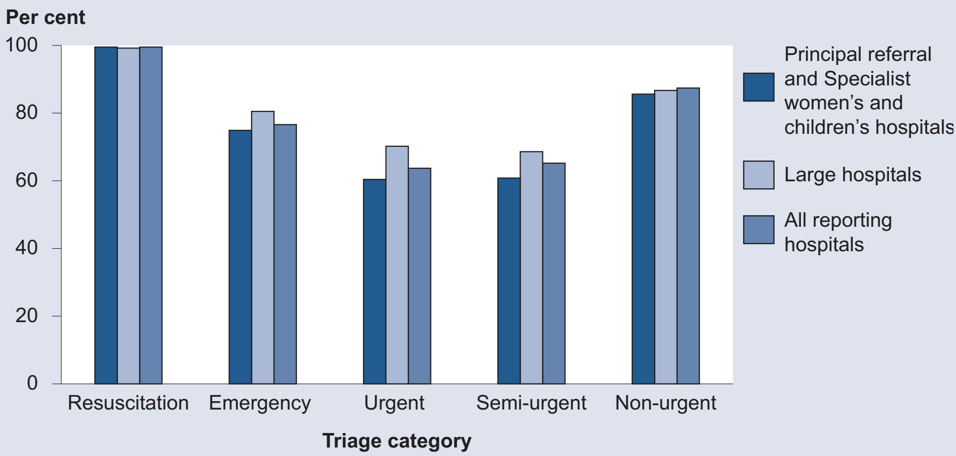
Between 2003–04 and 2005–06, information on emergency department waiting times was available for between 73% and 78% of all public hospital emergency department visits. Over this period, the proportion of patients assigned to each triage category remained fairly stable, with about 1% of patients assigned to the triage category of *Resuscitation*, 8% as *Emergency*, and about 78% as either *Urgent* or *Semi-urgent* (AIHW 2007a). Overall, the proportion of patients seen on time also remained fairly stable at around 69%. Almost all *Resuscitation* cases and over three-quarters of *Emergency* cases received treatment within the recommended time (Figure 7.36).



Source: AIHW 2007a.

Figure 7.36: Emergency department occasions of service seen on time, 2003–04 to 2005–06

In 2005–06, information on emergency department waiting times was available for about 78% of all public hospital emergency department occasions of service, including almost 100% of emergency department occasions of service in public hospitals that were classified as *Principal referral and Specialist women's and children's hospitals* and *Large hospitals* (AIHW 2007a). There was some variation among hospital peer groups in the proportion of patients receiving care on time. Overall, 65% of patients in the *Principal referral and Specialist women's and children's hospitals* and 73% of patients in the *Large hospitals* were treated in an appropriate time for their condition (Figure 7.37).

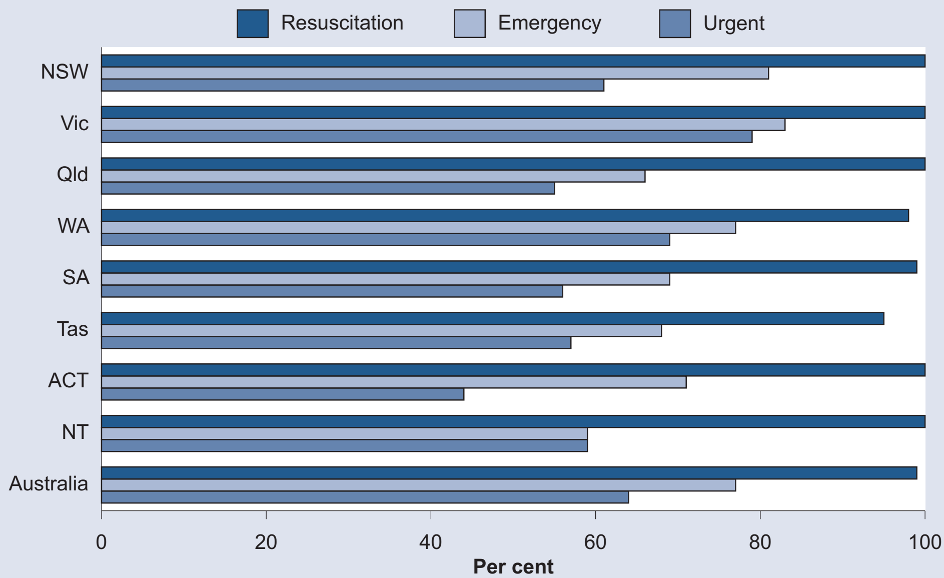


Note: 'All reporting hospitals' also includes data that were provided for hospitals in peer groups other than *Principal referral and Specialist women's and children's hospitals* and *Large hospitals*.

Source: National Non-admitted Patient Emergency Department Care Database.

Figure 7.37: Emergency department occasions of service seen on time, by hospital type, 2005–06

There was also some variation between jurisdictions in the proportion of patients treated within the recommended time, which may reflect variation in coverage, in how waiting times are recorded, in triage categorisation and in the types of patients who present to emergency departments (Figure 7.38).



Source: National Non-admitted Patient Emergency Department Care Database.

Figure 7.38: Emergency department occasions of service seen on time, by state and territory, 2005–06

Outpatient and other non-admitted hospital services

In 2005–06, there were over 14.9 million occasions where individuals received a service through specialised public hospital outpatient clinics, which provide allied health, obstetrics, oncology, dental, orthopaedic and other medical services. Additionally there were 23.5 million other non-admitted, non-emergency department occasions of service in public hospitals, including pathology (6.8 million), pharmacy (4.6 million), radiology and organ imaging (3.0 million) and community health (2.9 million).

In addition to the non-admitted services provided to individuals, around 385,000 services for groups of patients were delivered through public acute hospitals (around 1% of all non-admitted services).

Private hospitals also provide non-admitted patient services, with a different mix of services from public hospitals. In 2004–05, there were almost 1.1 million outpatient services provided in private hospitals and a further 39,000 other non-admitted, non-emergency department occasions of service.

Note that states and territories vary in how they collect data on non-admitted patient occasions of service, in the extent to which these types of services are provided in non-hospital settings (such as community health centres), and in admission practices for some services (such as chemotherapy). This variation may affect the comparability of data on this type of hospital activity (see Box 7.10).

7.4 Specialised health services

This section discusses services whose targets are particular health conditions such as mental illness. It also includes information on services provided by medical specialists in private practice.

Medicare-subsidised specialist services

Medicare data provide an overview of the use of medical specialist services funded through Medicare (see Box 7.6 for information on Medicare and Medicare benefits). These services include those provided by specialists in private practice as well as medical services for private patients in public and private hospitals.

During 2006–07, an average of 6.5 specialist services per Australian were provided under Medicare. These services included 4.2 *Pathology* items per person (including administrative items associated with the collection of specimens), 1.0 *Specialist attendances* and 0.7 *Diagnostic imaging* items (Table 7.19).

Table 7.19: Medicare items processed for specialist services, 2004–05 to 2006–07

	Items per person			Average annual change	Items in 2006–07		
	Number				Number	Proportion of total	Benefits paid
Broad type of service	**2004–05**	**2005–06**	**2006–07**	**(%)**	**('000)**	**(%)**	**($ million)**
Specialist attendances	1.02	1.04	1.03	0.5	21,689	15.8	1,320.4
Obstetrics	0.07	0.07	0.07	0.8	1,500	1.1	185.1
Anaesthetics	0.10	0.10	0.10	2.0	2,164	1.6	258.0
Pathology	3.82	4.03	4.17	4.5	87,542	63.9	1,741.6
Diagnostic imaging	0.69	0.73	0.75	3.6	15,655	11.4	1,714.0
Operations	0.34	0.35	0.34	0.9	7,245	5.3	1,022.4
Assistance at operations	0.02	0.02	0.02	2.5	354	0.3	45.5
Radiotherapy and therapeutic nuclear medicine	0.04	0.04	0.04	5.1	873	0.6	133.8
Total specialist items[(a)]	**6.10**	**6.37**	**6.52**	**3.4**	**137,022**	**100.0**	**6,420.8**

(a) Excludes specialist dental services.

Source: Medicare Australia 2007.

Benefits paid

In 2006–07, a total of $6,421 million was paid in Medicare benefits for specialist services, accounting for 55% of total Medicare benefits paid. The largest share of Medicare benefits for specialist services was paid for 88 million *Pathology* items ($1,742 million or 27%). A further $1,714 million (27%) was paid for 16 million *Diagnostic imaging services*; $1,320 million (21%) for 22 million *Specialist attendances*; and $1,022 million (16%) for 7 million *Operations* (Table 7.19).

To avoid double-counting, the bulk-billing incentive items are not counted in the broad type of service statistics or in bulk-billing statistics. However, the benefits paid for *Diagnostic imaging* and *Pathology* bulk-billing incentive items are included in their respective broad type of service categories (Table 7.19), and the bulk-billing incentives for other services (including attendances) are included in *All other services* (Table S37). This adds to the total for *All other services* that might otherwise be allocated to the service types for which the bulk-billing incentive was paid.

Medicare use increased in the three years from 2004–05 to 2006–07 across most types of specialist services. *Radiotherapy and therapeutic nuclear medicine* and *Pathology* Medicare services had the largest annual percentage increase (5% each), with *Pathology* showing the largest numeric increase per person of 0.35 services.

Geographic variation

There is considerable variation in the use of specialist Medicare services between the states and territories. In 2006–07, the highest number of specialist services per person was recorded in New South Wales with 7.0 services, followed by Victoria (6.6) and Queensland (6.4). The Northern Territory recorded the lowest per person use of specialist medical services with 2.9 (Table S39).

Specialised mental health services

Mental health is a matter of national importance. Previous studies have estimated that one in five Australians will experience mental illness at some stage in their lives and that over one million people have a disabling psychiatric condition.

There are a variety of public and private health service providers for mental health care. They include GPs and specialised mental health services such as private psychiatrists, community-based public mental health services, public and private psychiatric hospitals and specialised residential mental health services. Public specialised mental health services operate in each state and territory, providing services in community settings, residential care facilities, specialised psychiatric hospitals and specialised psychiatric units within public acute hospitals.

Ambulatory mental health care

Ambulatory services are those that do not involve overnight admission to a hospital or residential mental health facility.

The BEACH survey of general practice activity estimates that, in 2006–07, there were 10.7 million GP encounters involving mental health-related problems. This equates to 10.4% of total GP encounters and is equivalent to 514 encounters per 1,000 population. Most (60.2%) were for females, with more than one in four encounters for patients aged 65 years and over. *Depression* (33.4% of encounters) was the mental health problem most commonly managed by GPs, followed by *Sleep disturbance* (14.3%) and *Anxiety* (11.5%) (AIHW 2008).

During 2006–07, 3.2 million Medicare-subsidised mental health services were provided, resulting in an average number of services per patient of 5.1. These services included encounters with psychiatrists, clinical psychologists, GPs and other allied health professionals. Females used the mental health services subsidised through Medicare more than males, making up over half (60.9%) of the patients and averaging 5.2 services per female (compared with 4.8 per male) (DoHA 2007a).

Under the Medicare Benefits Schedule, GP encounters will most often be recorded as surgery consultations (over 90% of all encounters for which an MBS item was recorded).

The MBS mental health items claimable by GPs introduced on 1 November 2006 (item numbers 2710, 2712 and 2713) represented only 2% of MBS items recorded for mental health-related encounters in the 2006–07 BEACH survey (AIHW 2008).

Based on data provided by state and territory health authorities for public hospitals, the AIHW estimated that a minimum of 199,547 occasions of service related to mental health conditions occurred in emergency departments (EDs) during 2005–06; this represents about 13.1% of all ED occasions of service. More than one in four ED mental health-related occasions of service were for *Neurotic, stress-related and somatoform disorders* (28.2%), and 22.1% were for *Mental and behavioural disorders due to psychoactive substance use* (AIHW 2008).

In 2005–06, there were 117,924 'ambulatory-equivalent' mental health-related hospital separations (essentially, day-only hospitalisations that did not involve procedures) in Australia. Of these, 20.7% were in public hospitals and 79.3% in private hospitals. More than three-quarters (79.0%) of these separations involved specialised psychiatric care. *Depressive episode* was the most common principal diagnosis, accounting for 19.5% in 2005–06 (AIHW 2008).

There were 5.7 million mental health service contacts provided in public community mental health services and hospital outpatient services in 2005–06. A greater percentage of services was for males (49.1%) than females (43.1%) (in 7.8% of contacts sex was not reported). The most common principal diagnosis reported was *Schizophrenia, schizotypal and delusional disorders* (36.4%)(Table 7.20).

Table 7.20: Service contacts in government-operated community mental health services[(a)], 2005–06

Principal diagnosis	Number of service contacts	Per cent of specified principal diagnoses
Organic, including symptomatic, mental disorders	115,074	2.0
Mental and behavioural disorders due to psychoactive substance use	136,834	2.4
Schizophrenia, schizotypal and delusional disorders	2,064,194	36.4
Mood (affective) disorders	1,038,802	18.3
Neurotic, stress-related and somatoform disorders	414,224	7.3
Behavioural syndromes associated with physiological disturbances and physical factors	47,119	0.8
Disorders of adult personality and behaviour	182,746	3.2
Mental retardation	19,608	0.3
Disorders of psychological development	34,666	0.6
Behavioural and emotional disorders with onset usually occurring in childhood and adolescence	126,649	2.2
Other[(a)]	872,083	15.4
No principal diagnosis reported, including Mental disorder not otherwise specified	613,409	10.8
Total	**5,665,408**	**100.0**

(a) Includes all reported diagnoses that are not in the 'Mental and behavioural disorders' chapter of ICD-10-AM (codes F00 to F99).

Source: AIHW 2008.

Admitted patient mental health care

During 2005–06, there were 204,186 mental health-related separations for admitted patients from hospitals in Australia, excluding ambulatory equivalent mental health-related separations. Most (80.9%) were from public hospitals, with an overall average length of stay of 13.9 days. The majority of separations (58.1%) involved specialised psychiatric care. There was an average annual increase of 4.0% in specialised psychiatric care separations in private hospitals over the 2001–02 to 2005–06 period and a similar annual decline of 4.8% in private hospital separations without specialised psychiatric care. Overall, the total number of mental health-related separations increased by 2.2% per annum (Table 7.21).

Table 7.21: Admitted patient mental health-related separations with and without specialised psychiatric care, 2001–02 to 2005–06

	2001–02[(a)]	2002–03	2003–04	2004–05	2005–06	Average annual change (%)
Separations with specialised psychiatric care						
Public acute hospitals	71,891	73,972	76,042	76,172	76,019	–1.4
Public psychiatric hospitals[(b)]	13,877	13,371	14,188	12,887	13,255	1.1
Private hospitals	25,201	25,702	26,495	27,793	29,459	4.0
Total	*110,969*	*113,045*	*116,725*	*116,852*	*118,733*	*1.7*
Separations without specialised psychiatric care						
Public acute hospitals	63,755	66,607	68,087	70,975	75,195	4.2
Public psychiatric hospitals[(b)(c)]	787	1,055	1,048	1,136	770	–0.5
Private hospitals	11,532	11,462	11,852	10,390	9,488	–4.8
Total	*76,074*	*79,124*	*80,987*	*82,501*	*85,453*	*2.9*
Total mental health-related separations						
Public acute hospitals	135,646	140,579	144,129	147,147	151,214	2.8
Public psychiatric hospitals[(b)]	14,664	14,426	15,236	14,023	14,025	–1.1
Private hospitals	36,733	37,164	38,347	38,183	38,947	1.5
Total	**187,043**	**192,169**	**197,712**	**199,353**	**204,186**	**2.2**

(a) Excludes separations for which care type was reported as *Newborn* with no qualified days and records for *Hospital boarders* and *Posthumous organ procurement,* and ambulatory equivalent mental health-related separations.

(b) In Tasmania, some long-stay patients in public psychiatric hospitals were integrated into community mental health-care services during 2001–02. Consequently the number of separations and length of stay for public psychiatric hospitals may be inflated for the year.

(c) Mental health-related separations without specialised psychiatric care reported by public psychiatric hospitals relate to the provision of alcohol and drug treatment in New South Wales public psychiatric hospitals.

Source: AIHW 2008.

During 2005–06, mental health-related separations without specialised psychiatric care were mainly provided by public acute hospitals (88% of 85,453) (Table 7.21), with the highest percentage of separations being for those aged 65 years and older. The principal diagnosis of *Mental and behavioural disorders due to use of alcohol* accounted for the largest number of separations (16,361 or 19.1%). It was the most commonly reported diagnosis for public acute and private hospitals (AIHW 2008).

In 2005–06, the principal diagnosis of *Schizophrenia* accounted for the largest number of separations involving specialist psychiatric care (21,842 or 18.4%). It was the most commonly reported diagnosis for public acute and psychiatric hospitals. *Depressive episode* was the second most common diagnosis overall, and the most commonly reported diagnosis for private hospitals (Table 7.22).

Table 7.22: Admitted patient separations[(a)] with specialised psychiatric care, by principal diagnosis in ICD-10-AM groupings and hospital type, 2005–06

Principal diagnosis	Public acute hospitals	Public psychiatric hospitals	Private hospitals	Total	Total (%)
Schizophrenia	17,402	3,231	1,209	21,842	18.4
Depressive episode	10,844	1,068	7,226	19,138	16.1
Bipolar affective disorders	7,331	1,157	3,072	11,560	9.7
Reaction to severe stress and adjustment disorders	7,232	1,402	2,742	11,376	9.6
Recurrent depressive disorders	3,761	251	5,977	9,989	8.4
Schizoaffective disorders	5,078	1,028	1,268	7,374	6.2
Mental and behavioural disorders due to other psychoactive substance use	3,464	878	1,038	5,380	4.5
Specific personality disorders	3,642	542	542	4,726	4.0
Mental and behavioural disorders due to use of alcohol	1,623	542	2,331	4,496	3.8
Other anxiety disorders	994	57	1,032	2,083	1.8
Other specified mental health-related principal diagnosis[(b)]	9,852	2,077	2,660	14,589	12.3
Other[(c)]	4,796	1,022	362	6,180	5.2
Total	**76,019**	**13,255**	**29,459**	**118,733**	**100**

(a) Excludes separations for which care type was reported as *Newborn* with no qualified days and records for *Hospital boarders* and *Posthumous organ procurement*, and ambulatory equivalent mental health-related separations.

(b) Includes separations for which the principal diagnosis was any other mental health-related principal diagnosis.

(c) Includes all other codes not included as a mental health principal diagnosis.

Source: AIHW 2008.

There were marked gender differences in the number of separations for the 10 most commonly reported diagnoses involving specialist psychiatric care. For the most commonly reported diagnosis of *Schizophrenia*, the number of male separations was more than twice that of female separations. *Mental and behavioural disorders due to alcohol and other psychoactive substances* also displayed a similar pattern with more male separations than female separations. Female separations were higher, however, for the principal diagnoses of *Recurrent depressive disorders* and *Specific personality disorders* (AIHW 2008).

Residential mental health care

In 2005–06, there were 2,345 episodes of residential mental health care. This equated to 1.1 episodes per 10,000 population. Male patients accounted for a greater proportion (60.1%) of episodes of residential mental health care than females (37.7%). The most common principal diagnosis was *Schizophrenia*, which was reported for more than half of the episodes (54.1%), followed by *Schizoaffective disorders* (9.4%), *Bipolar affective disorders* (5.7%) and *Depressive episode* (5.2%) (AIHW 2008).

Mental health-related prescriptions

Overall, 182.5 million prescriptions for medications subsidised by the Pharmaceutical Benefits Scheme/Repatriation Pharmaceutical Benefits Scheme (PBS/RPBS) were provided by medical practitioners in 2006–07, of which 20.6 million (11.3%) were for mental health-related medications (Table 7.23). This was equivalent to 990 mental health-related prescriptions per 1,000 population. In interpreting this information, note that a person may have had several subsidised mental health-related prescriptions during the period covered.

Of these mental health-related prescriptions, 86.3% were provided by general practitioners, 9.5% by psychiatrists and 4.2% by non-psychiatrist specialists.

Most of the prescriptions were for antidepressant medication (58.3%, or 12.0 million), followed by anxiolytics (15.8%), hypnotics and sedatives (13.4%) and antipsychotics (9.7%). These proportions varied according to the specialty of the prescriber.

Table 7.23: Mental health-related prescriptions, by type of medication prescribed[a] and prescribing medical practitioner[b], 2006–07

ATC group (code)	General practitioners	Non-psychiatrist specialists	Psychiatrists	Total	Total (%)
Antipsychotics (N05A)[c]	1,453,905	153,690	390,425	1,998,020	9.7
Anxiolytics (N05B)	3,037,662	85,216	141,540	3,264,418	15.8
Hypnotics and sedatives (N05C)	2,632,598	85,360	54,435	2,772,393	13.4
Antidepressants (N06A)	10,642,397	391,199	1,004,580	12,038,176	58.3
Psychostimulants and nootropics (N06B)	48,906	155,341	69,984	274,231	1.3
Other ATC groups[d]	. .	. .	290,251	290,251	1.4
Total	**17,815,468**	**870,806**	**1,951,215**	**20,637,489**	**100.0**
Proportion of total (per cent)	*86.3*	*4.2*	*9.5*	*100.0*	. .

(a) Classified according to the Anatomical Therapeutic Chemical (ATC) Classification System (WHO 2008).

(b) Does not include 28,863 scripts where the prescriber's specialty was unknown and the ATC level 3 code was N05A, N05B, N05C, N06A or N06B.

(c) Includes clozapine dispensed through Section 100 arrangements by private hospitals.

(d) Includes other N codes as well as other ATC medication groups. Note that data for other ATC groups prescribed by general practitioners and non-psychiatrist specialist are not presented because they are not included in the definition of mental health-related medications.

Source: AIHW 2008.

Overall, mental health-related prescriptions increased from 19.8 million in 2002–03 to 20.6 million in 2006–07, at an average annual rate of 1.0%. The number of antipsychotics and antidepressants prescribed increased (on average by 7.3% and 1.7% per year, respectively), whereas prescriptions for hypnotics and sedatives and for anxiolytics decreased on average by 3.1% and 0.5% per year, respectively. During 2006–07, the Australian Government spent about $670 million on PBS/RPBS benefits for mental health-related medications, accounting for 10.8% of total PBS/RPBS expenditure (AIHW 2008).

Mental health labour force, hospitals and beds

The AIHW Medical Labour Force Survey estimated that 3,180 psychiatrists were employed in Australia in 2005, almost a quarter of whom (22.8%) were trainees. Taking into account hours worked, this translates to a full-time equivalent (FTE) workforce of 3,398, or 17 FTE psychiatrists per 100,000 population. Almost two-thirds of the psychiatrists (62.6%) were males and they were concentrated in Major Cities (AIHW 2008).

The AIHW Nursing and Midwifery Labour Force Survey estimated that out of a total of 244,360 nurses employed in Australia during 2005, 13,472 (5.5%) worked mainly in the area of mental health. Of these, 25.5% reported that they had completed a post-registration or post-enrolment course in mental health of more than 6 months duration. The average age of employed mental health nurses in 2005 was 46.4 years, which is slightly older than the 45.1 years for all employed nurses. In general, nursing is a very female-dominated profession, with 7.9% of nurses employed being male. However, male nurses made up almost a third (31.3%) of employed mental health nurses (AIHW 2008).

In 2004–05, 20 public psychiatric hospitals provided 2,487 beds at an estimated combined expenditure of $527 million. In addition, there were 122 public acute hospitals with psychiatric wards or units providing 3,450 beds and 26 private hospitals providing a further 1,512 beds. The estimated expenditure for private hospitals totalled $168 million. Between 2001–02 and 2004–05, annual real growth of expenditure for public and private psychiatric hospitals averaged 2.5% and 2.4% respectively (AIHW 2007a).

There were 234 government community and residential mental health facilities providing a further 1,226 beds, with a total recurrent expenditure of $985 million. Annual real growth in this expenditure averaged 5.3% between 2001–02 and 2004–05 (AIHW 2007a).

Sexual and reproductive health services

A range of clinical, community education and professional training services in sexual and reproductive health is provided by family planning organisations. Clinical services include contraceptive services, counselling and information services, early intervention and health promotion services, and the management of sexual and reproductive health.

Assisted reproduction technology

Since 1979, assisted reproduction technology (ART) has been used in Australia to help couples to achieve pregnancy. Box 7.11 outlines the main ART procedures.

Box 7.11: Assisted reproduction technology (ART) procedures

The main ART procedures include:

- in-vitro fertilisation (IVF), where eggs and sperm are combined in the laboratory for fertilisation outside the body and the fertilised eggs are placed in the uterus
- intra-cytoplasmic sperm injection (ICSI), where a single sperm is injected into an egg for fertilisation outside the body and the fertilised egg is placed in the uterus
- gamete intra-fallopian transfer (GIFT), where eggs and sperm are placed in the uterus for fertilisation inside the body.

The total number of ART treatment cycles has been increasing, indicating escalating demand for fertility services in Australia.

Data from the Australian and New Zealand Assisted Reproduction Database show that 35,810 ART treatment cycles were started in 2005 in Australia in which embryos/oocytes were transferred. Of these cycles, 26.4% achieved a clinical pregnancy and 20.7% resulted in a delivery. Fresh cycles achieved a higher pregnancy rate compared with thawed cycles (30.1% and 21.2% respectively).

The average age of females giving birth after ART treatment in 2005 was 34.6 years. ART mothers tended to have a high incidence of caesarean section (50.1%). Of the 7,405 pregnancies resulting from ART treatment in 2005 in Australia, 85.5% were singleton, 14.1% were twin deliveries and 0.3% were triplet deliveries.

Induced abortions

Induced abortion may be defined as the termination of pregnancy through medical or surgical intervention (FIGO 1999). There is no single comprehensive national data collection on induced abortion in Australia. Legislation relating to induced abortion varies among the states and territories (de Crespigny & Savulescu 2004; Petersen 2005). Notification of abortion is not required in New South Wales, Victoria, Queensland, Tasmania, the Northern Territory and the Australian Capital Territory.

The number of induced abortions in Australia has been estimated using data from the AIHW National Hospital Morbidity Database for admitted patients in all states and territories, and Medicare data for out-of-hospital services for those states and territories in which abortion services are provided in non-hospital facilities as well as in hospitals (AIHW NPSU: Grayson et al. 2005).

For 2004, the estimated number of induced abortions in Australia was 83,210 and the rate was 19.3 per 1,000 females aged 15–44 years. Females aged 20–24 years had the highest rate (31.3 per 1,000 females) and the lowest rate was for those aged 40–44 years (7.0 per 1,000) (Laws et al. 2006).

Alcohol and other drug treatment services

Alcohol and other drug treatment services cover a wide variety of treatment interventions and are provided in both residential and non-residential settings. Services provided can include detoxification and rehabilitation programs, information and education courses, and pharmacotherapy and counselling treatments.

In 2005–06, 664 treatment agencies managed or contracted by state, territory and/or the Australian Government reported data for the Alcohol and Other Drug Treatment Services National Minimum Data Set (AODTS NMDS), with over half (57%) identified as non-government agencies (AIHW 2007c). The AODTS NMDS covers almost all government-funded treatment service agencies. Major exceptions are services that are specific for Aboriginal and Torres Strait Islander peoples and those for which the sole treatment provided is opioid pharmacotherapy maintenance (for example, methadone treatment).

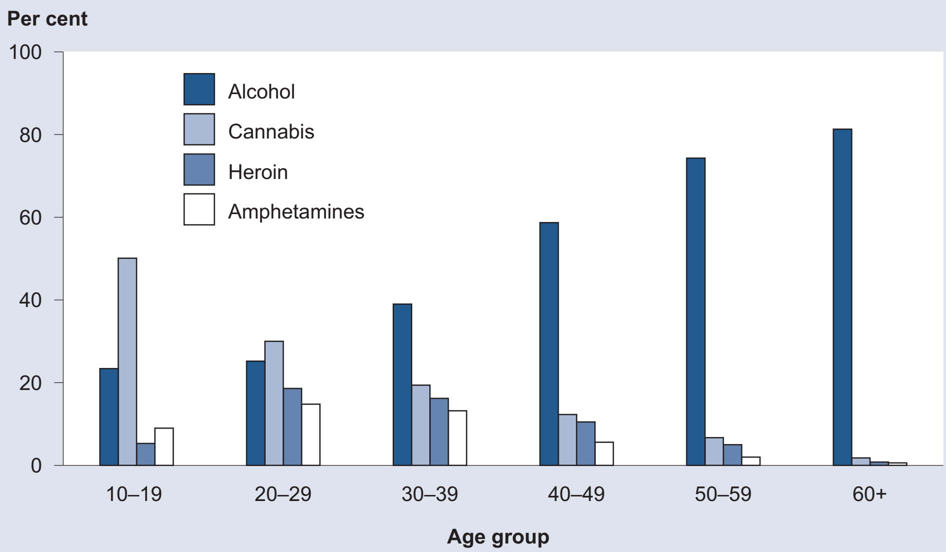
Since 2001–02, data on completed treatment episodes (‘closed’ treatment episodes) have been collected for the AODTS NMDS. A closed treatment episode refers to a period of contact (between a client and a treatment agency) with defined start and finish dates. A closed treatment episode may be for a single treatment (such as education and information only) or for a specific treatment (such as detoxification or counselling) that is part of a larger treatment plan.

During 2005–06, there were about 151,000 treatment episodes provided by the 664 reporting agencies. Male clients accounted for around two-thirds (66%) of these episodes and this proportion was unchanged since reporting began in 2001–02. The median age of persons receiving treatment for their own drug use was 31 years and for people using the service because of someone else's drug use the median age was 43 years.

What drug problems do people seek treatment for?

In 2005–06, there were around 145,000 episodes where clients were seeking treatment for their own substance use and in turn nominated a principal drug of concern. Nationally, alcohol (39%) and cannabis (25%) were the most common principal drugs of concern for clients who completed treatment, followed by heroin (14%) and amphetamines (11%). The proportion of episodes where treatment was sought for these substances remained relatively stable since 2001–02. Benzodiazepines accounted for 2% of closed treatment episodes in 2005–06, and fewer than 1% of episodes were for the principal drugs ecstasy and cocaine (0.6% and 0.3% respectively).

Cannabis was the drug of concern most commonly recorded for clients in the 10–19 years age group (50% of their episodes), whereas for those aged 30–39 years alcohol was the most common (39%) (Figure 7.39). Alcohol was the drug most likely to be the principal drug of concern overall, but it was especially so for older clients, nominated in 81% of episodes for those aged 60 years and over, and in 74% for those aged 50–59 years.



Note: These data exclude treatment episodes for clients seeking treatment for the drug use of others.

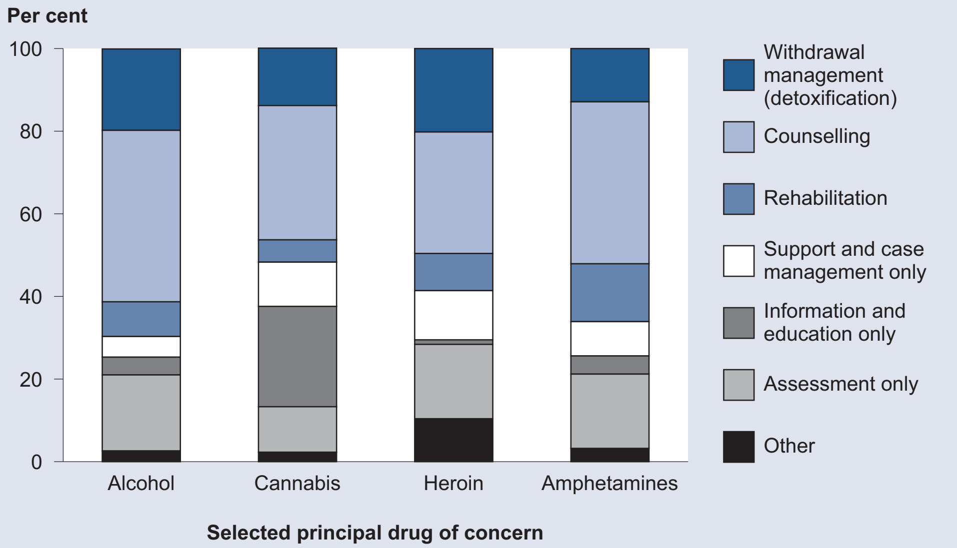
Source: AIHW 2007c.

Figure 7.39: Closed treatment episodes by selected principal drug of concern and age group, 2005–06

What types of treatments are provided?

In 2005–06, counselling was the most common form of main treatment provided (38% of treatment episodes), followed by withdrawal management (detoxification) (17%), assessment only (15%), information and education only (10%), support and case management only (8%) and rehabilitation (8%). The type of main treatment provided varied, depending on the principal drug for which the client sought treatment (Figure 7.40).

Overall, counselling accounted for the highest proportion of closed treatment episodes for all drugs of concern except for benzodiazepines (for example, valium) and for 'other' opioids. Where alcohol was the principal drug, the next most common treatment type was withdrawal management (detoxification) (20% of treatment episodes), followed by assessment only (18%) and rehabilitation (8%). This treatment mix was similar for clients whose principal drug was heroin. Clients receiving treatment for amphetamines (14%) and cocaine (15%) were more likely to receive rehabilitation than those receiving treatment for other substances. For treatment episodes where cannabis was reported as the principal drug, counselling (33%) was the most common treatment, followed by information and education only (24%), detoxification (14%) and assessment only (11%).



Notes

1. These data exclude treatment episodes for clients seeking treatment for the drug use of others.
2. *Other* includes 2,970 closed treatment episodes where the main treatment was reported as pharmacotherapy. This represents a small proportion of pharmacotherapy treatment in Australia because agencies whose sole activity is to prescribe and/or supply doses for methadone or other opioid pharmacotherapies are currently excluded from the AODTS NMDS.

Source: AIHW 2007c.

Figure 7.40: Closed treatment episodes by selected main treatment type and selected principal drug of concern, 2005–06

Other services for alcohol and drug treatment

There were 78,620 hospital separations reported in 2005–06 with a substance use disorder as the principal diagnosis, representing 1.1% of all hospital separations in Australia in that year (AIHW 2007c).

In 2005–06, an estimated 71,000 episodes of care were provided to clients of Australian Government-funded services that were specifically for Aboriginal and Torres Strait Islander substance use. All of these services reported providing treatment or assistance for client alcohol use. Other common substances/drugs for which these services provided treatment or assistance included cannabis (95% of the services), amphetamines and tobacco/nicotine (62% each). In 2005–06, almost three-quarters (73%) of clients reported multiple drug use (that is, using two or more substances).

Nationally, an estimated 38,659 clients were receiving pharmacotherapy treatment for opioid use on a 'snapshot/specified' day in June 2006—71% of these clients were receiving methadone, 23% buprenorphine, and 6% buprenorphine/naloxone.

National Diabetes Services Scheme

The National Diabetes Services Scheme (NDSS) subsidises the supply of insulin syringes, insulin infusion pump consumables and diagnostic reagents (blood and urine testing strips) to registered persons with diabetes (DoHA 2007). It is funded by the Australian Government and administered through Diabetes Australia Ltd, which coordinates the supply of products in all states and territories.

There were 844,062 persons with diabetes registered with the scheme as at 30 June 2007, an increase of about 6% over the previous financial year (Diabetes Australia 2007). At that time there were around 6,314 new registrants to the NDSS each month. Of those persons registered at 30 June 2007, the majority (69.3%) did not use insulin.

In 2006–07, subsidies were provided for over 3 million supplies of diagnostic reagents, 0.7 million needle and syringe supplies and 35,000 new insulin pump consumables, at a total cost of $113.7 million (DoHA 2007c and Diabetes Australia 2007). This represents an increase of 21% from the $94.1 million spent on the scheme in 2004–05.

Hearing services

Most hearing services in Australia are carried out by private practitioners. However, under a scheme administered by the Australian Government's Office of Hearing Services, some Australians are provided with free or subsidised hearing services (Box 7.12).

Box 7.12: The Office of Hearing Services

The Office of Hearing Services issues vouchers to eligible clients—those aged 21 years or over who are Pensioner Concession Card holders or their dependants; Department of Veterans Affairs (DVA) card holders in certain categories or their dependants; sickness allowance recipients or their dependants; clients referred from CRS Australia (formerly the Commonwealth Rehabilitation Service); and members of the Australian Defence Force. Clients obtain services such as hearing assessment; audiological rehabilitation and maintenance; prescription, selection and fitting of hearing devices; and subsidised battery supply and device repair.

In 2006–07, the Office of Hearing Services issued more than 213,000 clients with a voucher and there were about 706,000 voucher hearing services provided (Table 7.24). Most of these were maintenance services (53%), assessment services (26%) and fittings (19%). Between 2001–02 and 2006–07, the overall number of services increased by 34%, mainly due to increases in maintenance and assessment services. Although the numbers of most service types increased, the number of new single ear hearing aid fittings decreased by 34%, from around 17,000 to under 11,000.

Table 7.24: Hearing services provided through the voucher system, 2001–02 to 2006–07

Type of service	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07
Assessments						
New assessments	63,400	69,500	78,700	82,500	74,991	74,761
Return assessments	61,100	68,900	81,600	94,100	107,702	109,797
Total assessments	*124,500*	*138,500*	*160,300*	*176,500*	*182,693*	*184,558*
Hearing devices fitted						
New monaural	16,500	15,900	14,500	13,600	12,531	10,938
New binaural	34,000	39,400	44,900	50,500	47,415	48,399
Subsequent binaural	10,700	11,000	11,000	11,300	11,076	9,815
Return monaural	16,000	17,100	19,000	18,600	18,644	17,618
Return binaural	18,800	22,300	29,800	33,500	36,098	37,887
Total hearing aids fitted	*96,000*	*105,600*	*119,100*	*127,500*	*125,764*	*124,657*
Replacements	16,300	17,600	16,900	18,000	19,000	20,388
Maintenance	288,300	303,400	322,600	336,900	358,095	376,452
Total	**525,100**	**565,100**	**618,900**	**658,900**	**685,552**	**706,055**

Note: Totals may not be the sum of the rows because of rounding.

Source: Office of Hearing Services unpublished data.

The Australian Government also provides free hearing services directly to anyone under 21 years of age through its agency Australian Hearing. In addition, under its Community Services Obligation program, Australian Hearing also provide services to Aboriginal and Torres Strait Islander peoples aged 50 years and over, participants in Community Development Employment Projects and adults with special needs—for example, people with complex hearing rehabilitation needs and those living in remote locations.

In 2006–07, services were provided to more than 26,000 Australians under the age of 21 years and to almost 10,000 adults with special needs (Office of Hearing Services, unpublished data). Of the 38,000 persons provided with services, over 6,000 (12.8%) identified as Aboriginal or Torres Strait Islander and 3,000 (6.4%) as persons living in a remote area.

Palliative care services

Palliative care is the specialised care of people who are terminally ill. The care adopts a holistic approach that emphasises quality of life and the relief of suffering. Care may be provided by specialist and non-specialist providers. Palliative care services may be provided in a number of settings, including to admitted patients in acute hospitals, in non-admitted hospital settings, in designated palliative care units (including hospices), and in the community. Using a multidisciplinary approach, palliative care specialists provide direct care to patients and their carers, and consultative services to non-specialist palliative care providers. Non-specialist palliative care services do not work substantially in the area of palliative care, but have a 'first contact' relationship with people with terminal illnesses and adopt a palliative approach. Providers of non-specialist palliative care may include general practitioners, community nursing agencies and residential aged care facilities.

In 2006, states and territories identified 326 government-funded agencies that provide palliative care in Australia. These included specialist palliative care agencies and non-specialist agencies that received specific funding to provide palliative care. A survey of these agencies found that, of the 242 that provided information on their level of specialisation, 68% (165 agencies) considered themselves specialist palliative care agencies and 32% (77 agencies) considered themselves non-specialist. Sixty-three per cent of agencies mostly delivered care in community settings (most commonly private residences), 23% mostly delivered care in admitted patient settings, and 14% delivered a similar amount of care in both settings (AIHW 2007b).

In 2005–06, there were 25,741 palliative care separations from Australian hospitals for admitted patients who received care in a specific hospice or palliative care unit within a hospital, according to a palliative care program, or where the principal clinical intent was deemed to be palliative. The average length of stay for these separations was 12.4 days and 79% were from public hospitals. Fifty-five per cent of all palliative care separations were for males and 71% were for patients aged 65 years and over. Seventy-three per cent of palliative care separations had a principal diagnosis of cancer.

Currently, no national data are available about the number of palliative care services that are delivered in non-admitted settings, such as through community health services.

Health services in the Australian Defence Force

Australian Defence Force (ADF) personnel are provided with a comprehensive range of health services, including emergency, acute and ongoing clinical care, rehabilitation, health screening, occupational fitness assessment and preventive health activities. Primary health care is provided mainly in-house by uniformed and contracted health-care providers. Uniformed health providers make up 4.7% of the full-time ADF and include medical, dental and nursing officers, allied health personnel and medical assistants. ADF health facilities can provide a range of outpatient services, low-level admitted patient care and limited surgical capability. Many ADF health facilities also have dental, pharmacy and rehabilitation services. However, many of the health services provided to ADF personnel are purchased from the civilian sector, using a mix of contracted, sessional and fee-for-service arrangements.

Health promotion

Within the range of health services provided, the ADF Health Promotion Program aims at identifying and managing health risk factors, lifestyle issues and early disease among ADF members (ADF 2001). Every member undergoes an annual health assessment, which is replaced by a comprehensive preventive health examination every fifth year. These examinations include a health questionnaire and physical examination that focus on height, weight and body mass index, blood pressure, vision and hearing; and lifestyle factors including smoking, alcohol consumption, mental health issues, sun protection, dental health and sexual health. Vaccination status is also checked and members are offered appropriate routine screening such as Pap smears, mammography or faecal occult blood tests. Routine dental assessments also occur annually.

Injury prevention

The Defence Injury Prevention Program (DIPP), established in 2000, helps ADF members prevent injuries by using local knowledge and expertise. The DIPP collects injury information that highlights the number and type of injuries and the circumstances that led to the injury. This information is analysed and interpreted in order to find ways to prevent injury in the future.

Use of Australian hospital services

When the ADF pays for treatment in Australian hospitals, it is more likely that treatment will take place in a private hospital. In 2005–06, private hospital separations made up 87% of total recorded ADF-funded Australian hospital admissions. Private hospital separations had a shorter average length of stay than public hospital separations—1.6 days for private hospitals compared with 2.6 days for public hospitals.

Table 7.25: Use of hospital services in Australia by the Australian Defence Force, 2005–06

	Public hospitals	Private hospitals	Total
Number of separations	906	6,225	7,131
Patient days	2,390	9,982	12,372
Average length of stay	2.64	1.60	1.73

Note: Separations for which the care type was reported as *Newborn* with no qualified days, and records for *Hospital boarders* and *Posthumous organ procurement* have been excluded.

Source: National Hospital Morbidity Database unpublished data.

Rehabilitation

Defence has always provided rehabilitation as an integral part of health care. The ADF has formalised the rehabilitation program (ADF 2006) with the introduction of the Military Rehabilitation and Compensation Act in 2004. The demand for rehabilitation services has increased, because of broader referral and formal identification of rehabilitation assessment plans and case management (ADF 2004). In 2006–07, there were 4,710 rehabilitation assessments (with 2,383 cases open as at 30 June) compared with 1,849 in 2005–06. The two most common conditions for which rehabilitation was undertaken were musculoskeletal injuries and conditions (68.5%) and mental health disorders (7.2%).

Mental health

The mental health of ADF personnel is a high priority. Mental health disorders make up 7% of referrals for rehabilitation and were the fourth most common reason for time off work.

The ADF mental health strategy (ADF 2003) was launched in 2002, and recognises that mental health is not just related to diagnosable mental disorders but encompasses a broad range of lifestyle, mental wellbeing and job performance factors. The strategy continues to be refined and to focus on prevention and evidence-based treatment to maximise retention and enhance the quality of life for ADF personnel. The strategy consists of six key initiatives:

- integration and enhancement of ADF mental health services
- ADF mental health research and surveillance
- enhanced resilience and wellbeing

- critical incident mental health support
- suicide prevention program
- alcohol, tobacco and other drugs service.

Psychological support

Mental health services are provided by uniformed medical officers, psychologists, nursing officers and chaplains, and a range of civilian specialists and social workers. These activities include post-deployment psychological screening and support, administrative referrals for psychological reasons, medical referrals, self-referrals for psychological support, and critical incident stress management interventions. Services are delivered by the Psychology Support Group and by psychology staff, who perform the majority of post-deployment psychological screening and support.

Training of ADF personnel as well as health-care providers is a key element of the mental health strategy. Mental health training covers issues such as mental health during military operations, traumatic stress, suicide prevention, critical incident support and psychological resilience training.

Pharmaceutical use

During 2006–07, 600,978 items were dispensed through ADF pharmacies. The top five most commonly prescribed therapeutic classes are presented in Table 7.26.

Table 7.26: Top five prescribed therapeutic classes, ADF, 2006–07

Therapeutic class	Cost ($)	Number of packs dispensed
Antibiotic	417,670	61,013
Simple analgesia	71,646	21,994
Antihypertensive	827,736	16,705
Hormonal contraceptive	343,748	11,574
Proton pump inhibitor (alone and combination)[(a)]	405,967	11,113

(a) Lowers stomach acid.

Source: ADF unpublished data.

7.5 Use of medicines

According to the 2004–05 National Health Survey, the use of medications is a common health-related action taken by Australians. Whether it be conventional prescription medication (237 million prescriptions filled in 2006) or over-the-counter medications such as analgesics (pain-killers), cough medicines, vitamins and complementary medications, this is an important component of the health system, accounting for over 14% ($3.0 billion) of recurrent health expenditure in 2005–06.

Prescription medications are provided largely through community pharmacies and hospitals, whereas non-prescription medicines and complementary and alternative medicines are available from pharmacies and other retail outlets. At 30 June 2007, there were 4,992 approved community pharmacies and friendly societies in Australia (DoHA 2007b).

Prescribed medicines

Information on the supply of prescription medicines in the community is compiled by Medicare Australia. This information is derived from prescriptions submitted for subsidy payment under the Pharmaceutical Benefits Scheme or the Repatriation Pharmaceutical Benefits Scheme (PBS and RPBS, see Box 7.13). Estimates of the use of non-subsidised prescription medicines are sourced from the Pharmacy Guild of Australia's ongoing survey of community-based pharmacies. Data are not available on the use of prescribed medicines in public hospitals and most private hospitals.

Box 7.13: The Pharmaceutical Benefits Scheme and the Repatriation Pharmaceutical Benefit Scheme

The Pharmaceutical Benefits Scheme (PBS) subsidises the cost of a wide range of prescription medications, providing Australians with access to necessary and cost-effective medicines at an affordable price. As of December 2007, the scheme covered 819 drug substances (generic drugs), available in 2,749 forms and strengths (items) and marketed as 3,481 products (brands).

The Repatriation Pharmaceutical Benefits Scheme (RPBS) provides assistance to eligible war veterans and dependants. It is generally similar to the PBS for concessional beneficiaries (see below), but covers a somewhat broader range of pharmaceuticals.

Before a medicine can be subsidised by the PBS, it is assessed by the Pharmaceutical Benefits Advisory Committee, which includes medical practitioners, other health professionals and a consumer representative. The committee takes into account the medical conditions for which the medicine has been approved for use in Australia by the Therapeutic Goods Administration, its clinical effectiveness, its safety and its cost-effectiveness compared with other treatments. Once the committee has recommended a medicine, it is considered by the Pharmaceutical Benefits Pricing Authority. The price is negotiated between the manufacturer and the Australian Government Department of Health and Ageing, and the Australian Government then considers the listing.

Australian residents and visitors from countries with Reciprocal Health Care Agreements are eligible for PBS benefits.

Patients are grouped into two classes: general and concessional. As at 1 January 2008, general patients paid the first $31.30 for each PBS prescription item. For concessional patients (people with low incomes and sickness beneficiaries who hold a health care card), the payment was $5.00 per prescription item. These co-payments are increased on 1 January each year, generally in line with Consumer Price Index increases.

Individuals and families are protected from large overall expenses for PBS-listed medicines by safety nets. For the calendar year to 2007, once a general patient and/or immediate family had spent $1,141.80, the patient co-payment per item decreased to the concessional rate of $4.90. For concessional patients, the $5.00 co-payment was not required once their expenditure on PBS items exceeded $290.00.

Patients may pay more than the standard co-payment where a PBS item is priced above the benchmark price for different brands of the same drug or the benchmark price for a particular therapeutic group of drugs. These additional payments do not count towards safety nets.

During 2006, there were 168 million community PBS prescriptions—26 million for general patients and 142 million for concessional patients (Medicare Australia 2007). Although this was at similar levels to 2005, in the 10 years since 1997 there was a 31% increase in the number of community PBS prescriptions. Additionally, there were 15 million RPBS prescriptions in 2006 and 0.5 million PBS doctor's bag prescriptions (that is, emergency drugs that the doctor can provide to patients free of charge).

In 2006, there were about 54 million prescriptions which did not attract a subsidy under the PBS or the RPBS (35 million below the co-payment threshold and about 19 million private prescriptions). The impact of co-payments on demand for prescriptions is hard to assess. In the 10 years since 1997 the increase in the number of community PBS prescriptions (31%) was considerably larger than the growth in the Australian population (11%) and the growth in the population of Australians aged 65 years and over (18%).

Trends in prescribed medicines

There has been a steady increase in the total number of community prescriptions, from 166 million in 1994 to 237 million in 2006 (Table 7.27), representing an average annual growth of 3% or a total growth over the period of 43%. The growth in the number of PBS/RPBS prescriptions is less regular than the growth in overall prescriptions because of variations in the co-payment schemes over the years. The PBS/RPBS prescriptions increased from 72% of total community prescriptions in 1994 to 77% in 2006, whereas prescriptions which cost below the co-payment threshold decreased from 20% of the total in 1994 to 15% in 2006. PBS/RPBS prescriptions increased by 52% over the period, compared with an increase of 3% for prescriptions below the co-payment level. There was a 62% increase in private prescriptions between 1994 and 1996.

Table 7.27: Number of community prescriptions, 1994 to 2006

Type	Calendar year 1994	1996	1998	2000	2002	2004	2006	Change 1994 to 2006	Average annual change 1994 to 2006
	(Million)							(%)	(%)
PBS concession	97.0	105.8	107.3	120.5	132.3	141.4	141.9	46	3.2
PBS general	17.2	18.5	18.8	21.8	25.2	29.5	25.8	50	3.4
RPBS	5.4	8.7	10.2	12.5	15.0	15.7	14.7	170	8.6
PBS/RPBS total	*119.6*	*133.0*	*136.4*	*154.8*	*172.5*	*186.6*	*182.3*	*52*	*3.6*
Private	11.9	11.7	15.1	14.3	16.0	18.1	19.3	62	4.1
Under co-payment	33.6	34.1	35.4	30.7	27.6	28.2	34.6	3	0.2
Other[(a)]	0.8	0.8	0.8	0.5	0.5	0.5	0.5	–35	–3.6
Total	**165.9**	**179.6**	**187.6**	**200.3**	**216.6**	**233.4**	**236.8**	**43**	**3.0**

(a) 'Other' refers to doctor's bag.

Source: Drug Utilisation Sub Committee drug utilisation database, DoHA unpublished.

Which drugs are prescribed the most?

Apparent use of prescription medicine can be described using the defined daily dose per 1,000 population per day (DDD/1,000/day) as the unit of measurement. The DDD is based on the assumed average dose per day of the drug used for its main indication (reason for use) by adults. It provides an estimate of how many people per 1,000 population are taking the standard dose of the drug each day, on average, and allows for comparisons independent of differences in quantities of drugs per prescription. These estimates assume, however, that the amount of medicines supplied is the same as the amount used, and that will not always be the case.

In 2005–06, atorvastatin (used for lowering blood cholesterol) was the most commonly used generic drug measured by DDD/1,000/day (Table 7.28), followed by simvastatin (also for lowering blood cholesterol) and ramipril (for treating high blood pressure and heart failure). The top four generic medications by prescription volume in 2005–06 were atorvastatin and simvastatin (9.1 million and 6.4 million prescriptions respectively), followed by amoxycillin (an antibiotic, 5.0 million prescriptions) and paracetamol (a pain-killer, 4.4 million prescriptions). For most of these high-volume prescriptions, the vast majority were provided through the PBS or RPBS; however, amoxycillin was provided as a non-PBS/RPBS prescription half the time (2.5 million prescriptions).

Table 7.28: Top 15 generic medications, 2005–06

		Defined daily dose per 1,000 population			Prescriptions ('000)		
Generic name	Action	PBS/ RPBS(a)	Other(b)	Total	PBS/ RPBS(a)	Other(b)	Total
Atorvastatin	Lowers blood cholesterol	115.6	0.2	115.8	9,048	20	9,068
Simvastatin	Lowers blood cholesterol	58.4	0.1	58.5	6,357	14	6,371
Amoxycillin	Antibiotic	2.7	2.7	5.3	2,424	2,546	4,970
Paracetamol	Pain-killer	14.1	0.5	14.6	4,207	152	4,360
Omeprazole	Lowers stomach acid	19.4	0.1	19.5	4,183	21	4,204
Atenolol	Lowers blood pressure	9.9	2.8	12.7	3,260	918	4,179
Salbutamol	Opens airways	18.0	7.4	25.4	2,944	1,132	4,076
Codeine with paracetamol	Pain-killer	n.a.	n.a.	n.a.	2,607	1,420	4,027
Perindopril	Lowers blood pressure	14.8	2.7	17.5	3,125	755	3,881
Irbesartan	Lowers blood pressure	17.9	4.5	22.3	3,026	840	3,866
Cefalexin	Antibiotic	1.4	1.0	2.4	2,202	1,620	3,822
Esomeprazole	Lowers stomach acid	14.2	0.0	14.2	3,717	7	3,724
Ramipril	Lowers blood pressure	35.7	3.2	38.9	3,025	437	3,462
Metformin hydrochloride	Lowers blood glucose	11.8	3.0	14.8	2,727	673	3,400
Irbesartan with hydrochlorothiazide	Lowers blood pressure	n.a	n.a	n.a	2,963	228	3,190

(a) PBS—Pharmaceutical Benefits Scheme; RPBS—Repatriation Pharmaceutical Benefits Scheme.

(b) Prescriptions not subsidised by the PBS or RPBS, because they were private prescriptions or the cost to the patient was not more than the co-payment.

Source: Drug Utilisation Sub Committee drug utilisation database (DoHA unpublished).

The use of some prescription medicines has changed markedly in recent years. For example, between 2000–01 and 2005–06 there was a 159% increase in the DDD/1,000/day for atorvastatin (for lowering blood cholesterol) and a 79% increase for a similar drug, simvastatin (Table S36).

Atorvastatin, simvastatin and esomeprazole were the highest cost drugs for the PBS in 2005–06, with PBS expenditure on them totalling $581.5 million, $360.9 million and $192.5 million respectively. The next most costly were fluticasone (a drug that reduces airway inflammation, $190.0 million) and omeprazole (which lowers stomach acid, $170.2 million) (DoHA 2007b).

GP prescribing patterns

The BEACH survey of general practice activity collects information on drugs prescribed by GPs (Britt et al. 2007). In 2005–06, medications were prescribed at a rate of 83 per 100 GP encounters. Medications for the nervous system, including analgesics (pain-killers) and antidepressants, were the most commonly prescribed group, accounting for 21.7% of all prescriptions. The next most common were antibiotics (20.4%), cardiovascular medications (19%), alimentary tract and metabolism medications (9.5%) and respiratory medications (6.2%).

Four of the 10 most frequently prescribed medications were from the antibiotic group (Table 7.29). Simple analgesics were also frequently prescribed, reflecting their prescription for health care card holders, for whom they are a cheaper option than over-the-counter purchase.

Table 7.29: Medications most frequently prescribed by GPs, 2005–06

Generic name	Action	Proportion of prescriptions (%)	Prescriptions per 100 encounters
Amoxycillin	Antibiotic	4.2	3.6
Paracetamol	Pain-killer	3.5	3.0
Cephalexin	Antibiotic	2.9	2.5
Paracetamol/codeine	Pain-killer	2.3	2.0
Amoxycillin/potassium clavulanate	Antibiotic	1.9	1.7
Atorvastatin	Lowers blood cholesterol	1.9	1.6
Salbutamol	Opens airways	1.7	1.5
Roxithromycin	Antibiotic	1.7	1.5
Metformin	Lowers blood glucose	1.4	1.2
Simvastatin	Lowers blood cholesterol	1.4	1.2

Note: These data refer to prescriptions written by GPs. Actual prescriptions filled per 100 encounters may be higher than the numbers in this table, because many prescriptions have 'repeats'—drugs for chronic disorders frequently have five repeats.

Source: Britt et al. 2007.

Non-prescribed medicines

The only information available on the use of non-prescribed medicines is from the BEACH survey which collects and reports information on drugs that GPs advise patients to purchase over the counter, and those that the GPs supply directly.

In 2005–06, 9.3% of medications prescribed, advised or provided by GPs in the BEACH survey were advised for over-the-counter purchase, and 8.5% were supplied by the GP. Over a quarter of drugs (25.9%) advised for over-the-counter purchase were for paracetamol and 5.8% for ibuprofen (an anti-inflammatory drug). The most common medications supplied directly by GPs were vaccines.

7.6 Medical indemnity claims

In some cases, the recipient of a health-care service may decide to pursue a medical indemnity claim against a health professional or organisation based on the allegation that the patient has suffered some kind of harm as a result of the care received.

The Medical Indemnity National Collection (MINC) was established in 2002 as a result of concerns about health-care litigation, the associated costs, and the financial viability of both medical indemnity insurers and medical personnel. The MINC collates information on the nature, method of settlement and costs of medical indemnity claims (Box 7.14). Establishment of the MINC data collection was coordinated with the development of several other federal, state and territory government initiatives to better manage medical indemnity issues in Australia.

The MINC covers public and private sector medical indemnity claims arising in health-care facilities and other clinical service contexts. Public sector claims include claims against health-care professionals employed by all public sector health facilities and services. Private sector claims include claims made against doctors holding individual policies with a medical indemnity insurer. Claims against private hospitals are not currently included in the MINC.

Box 7.14: Medical indemnity definitions

Medical indemnity insurance—a form of professional indemnity insurance. In the public sector, this insurance is mostly provided by state and territory health authorities.

Medical indemnity claim—a claim for compensation for harm or other loss as a result of a health-care incident.

New claim—a claim opened during the reporting period.

Current claim—a claim that remains open at the end of the reporting period, including a new claim.

Closed claim—a claim that has been closed during the reporting period, including new claims closed in the reporting period.

All claims—the total set of claims that were open at any time during the reporting period (the sum of current and closed claims).

Procedure—includes failure to perform a procedure, wrong procedure performed, wrong body site, post-operative complications, failure of procedure, and other procedure-related issues.

Diagnosis—includes missed, delayed or incorrect diagnosis.

Treatment—includes delayed treatment, treatment not provided, complications of treatment, failure of treatment, and other treatment-related issues.

General duty of care issues—includes falls, administrative errors and patient monitoring and follow-up issues.

Consent—includes failure to warn.

Medication-related—includes type, dosage and method of administration issues.

Public sector medical indemnity claims in 2005–06

In the period 1 July 2005 to 30 June 2006, almost 2,000 new medical indemnity claims were made in the public sector and 1,628 claims were closed. There were 5,294 current claims in the reporting period (Table 7.30).

The number of all claims appeared to rise over the 3 years of the public sector MINC collection, from 4,956 in 2003–04 to 6,922 in 2005–06 (Table 7.30). This may not reflect an actual rise in the number of claims being made over this period because this number may be affected by an improvement in reporting capability. Reporting improved overall from 80% of claims in scope in 2003–04 to 89% in 2005–06.

Public sector claims information includes the specialty of the clinician or clinicians (as many as four) who were involved in the alleged harm giving rise to the claim. In 2005–06, the most commonly recorded specialties were general surgery (816 claims), obstetrics only (813 claims) and emergency medicine (791 claims), but if the specialities of obstetrics and gynaecology were combined they would account for 1,428 claims (AIHW 2007d).

The service context is the area of clinical practice or hospital department in which the patient was receiving the health service which led to an allegation of harm. The context most frequently recorded for all claims in 2005–06 was obstetrics (17.8%) followed by general surgery (14.1%), and accident and emergency (13.6%). Throughout 2003–04 to 2005–06, obstetrics was the most frequently reported clinical service context, and the proportion of claims citing general surgery increased. Over the same period, the proportion of claims citing other specialties such as gynaecology, orthopaedics and psychiatry remained stable or declined (AIHW 2007d).

The primary incident/allegation type describes what is alleged to have 'gone wrong'; that is, the area of the possible error, negligence or problem that gave rise to a claim. The most common primary incident or allegation types for all claims in the public sector in 2005–06 were procedure-related problems (such as invasive clinical intervention or investigation), which made up 34.1% of all claims, followed by diagnosis (19.8%) and treatment (13.7%). Procedure was cited as the primary incident or allegation type in over half the claims where gynaecology, obstetrics, general surgery or orthopaedics was reported as the clinical context, and diagnosis accounted for over half of the claims in an accident and emergency clinical context.

Data are also collected on the primary body function or structure alleged to have been affected by the incident giving rise to the claim. In 2005–06, the most commonly affected primary body function/structure (as reported) was neuromusculo-skeletal and movement-related functions and structures (21.0% of all claims), followed by mental functions/structures of the nervous system (14.0%), and genitourinary and reproductive functions and structures (11.5%). From 2003–04 there was little change in the proportion of claims relating to the various primary body function/structure categories, apart from a decline in genitourinary and reproductive functions and structures, and a slight increase in functions and structures of the digestive, metabolic and endocrine systems.

In 2005–06, 4.0% of closed claims were settled by a court decision and 51.5% were discontinued. In 3% of closed claims the mode of finalisation was not reported. The balance of closed cases (41.7%) were settled via other methods including state/territory-based complaints processes, court-based alternative dispute resolution processes and statutorily mandated compulsory conference processes.

More than half the claims closed during 2005–06 had a total claim size of less than $10,000 (60.5%) and 3.8% of closed claims were settled for $500,000 or more (AIHW 2007d).

Table 7.30: Public sector medical indemnity claims 2003–04 to 2005–06

	2003–04	2004–05	2005–06
		Number	
New claims[a]	*1,641*	*1,641*	*1,943*
Current claims	4,096	4,773	5,294
Closed claims	860	1,680	1,628
All claims[b]	**4,956**	**6,453**	**6,922**
Percentage of claims in scope[c]	*80.0*	*85.0*	*89.0*
		Per cent[d]	
New claims[a]	*33.1*	*25.4*	*28.1*
Current claims	82.6	74.0	76.5
Closed claims	17.4	26.0	23.5
All claims	**100.0**	**100.0**	**100.0**

(a) New claims, which are those that were opened during the reporting period, are also classified as either current or closed. For this reason, new claims would be double-counted if they were added to current and closed claims in calculating the number of all claims.

(b) All claims is the total set of claims, including those open at the start of the period, in the MINC during the reporting periods.

(c) Percentage of claims in scope reflects the percentage of all relevant claims data held by jurisdictions that was reported to the MINC.

(d) New, current and closed claims as a percentage of all claims.

Source: AIHW 2007d.

Combined public and private sector claims information

Recently the AIHW began to receive claims data from the private medical indemnity insurance sector, allowing private sector claims data to be combined with public sector claims data for the first time, for the year 2004–05 (AIHW 2007e). However, there are limits on the data that can be reported in the combined report owing to differences in how claims information is captured in the public and private sectors.

In the public and private sectors in 2004–05, over half the current claims were related to procedure (29.1%) and diagnosis (23.6%). More than half of claims allegedly involving specialists from general surgery, gynaecology, obstetrics and gynaecology and orthopaedic surgery cited procedure as the primary incident/allegation type. Diagnosis was the primary incident/allegation type most often cited in claims allegedly involving an emergency medicine specialist (Table 7.31).

The most common primary body function or structure allegedly harmed as a result of health care for new claims in 2004–05 was neuromusculoskeletal and movement-related (21.3%). This was followed by mental functions and structures of the nervous system (12.2%) and genitourinary and reproductive structures and functions (11.0%). These proportions are similar to those reported in 2004–05 for the public sector medical indemnity data.

Over half (53.4%) of the claims closed were settled for less than $10,000 and no payment was made in 12.7% of claims. A small proportion of claims (1.7%) were settled for more than $500,000 (AIHW 2007e).

Table 7.31: Public and private sector current claims: specialty of clinician, by primary incident/allegation type, 30 June 2005

	Primary incident/allegation type (%)							
Specialty of clinician(s)	Pro-cedure	Diag-nosis	Treat-ment	General duty of care issues	Consent	Medica-tion-related	Other	Not reported
Emergency medicine	53.8	11.0	9.7	4.8	8.6	0.8	10.5	1.0
General surgery	58.5	9.9	14.6	4.9	4.2	0.7	7.0	0.3
Gynaecology	20.6	24.4	14.0	10.7	4.0	5.3	20.2	0.7
Obstetrics	57.2	15.7	6.3	5.3	5.9	1.0	8.3	0.4
Obstetrics & gynaecology	5.0	56.3	20.6	3.4	1.3	4.4	8.4	0.6
Orthopaedic surgery	65.3	7.7	3.4	3.7	9.4	1.0	8.4	1.0
Other hospital-based medical practitioner	55.6	15.1	15.8	4.3	1.1	1.4	3.9	2.9
Psychiatry	1.4	18.4	7.5	23.1	2.7	9.5	36.7	0.7
Not yet known	12.1	11.2	7.5	4.2	2.8	0.9	18.2	43.0
All other specialties	19.4	25.6	9.4	10.0	6.5	6.0	22.6	0.6
Total	27.7	22.5	10.3	8.9	5.8	4.6	18.6	1.7

Source: AIHW 2007e.

References

ABS (Australian Bureau of Statistics) 2001. Australian Standard Geographical Classification, 2001. ABS cat. no. 1216.0. Canberra: ABS.

ABS 2005. Private hospitals in Australia 2003–04. ABS cat. no. 4390.0. Canberra: ABS.

ABS 2006. National Health Survey: summary of results, 2004–05. ABS cat. no. 4390.0. Canberra: ABS.

ACSQHC (Australian Council for Safety and Quality in Health Care) 2001. First national report on patient safety. Canberra: ACSQHC.

ADF (Australian Defence Force) 2001. Defence Instruction (General) Personnel 16–18—Australian Defence Force policy for the Health Promotion Program, 27 September 2001.

ADF 2003. Health Directive 260 *An introduction to the management of mental health problems in the Australian Defence Force*, 18 August 2003.

ADF 2004. Military Rehabilitation and Compensation Act 2004 (Cth). Viewed 16 July 2006, <www.austlii.edu.au>.

ADF 2006. Defence Instruction (General) Personnel 16–22 *Australian Defence Force rehabilitation program*, 30 June 2006.

AHRQ (Agency for Healthcare Research and Quality) 2002. AHRQ indicators—guide to inpatient quality indicators: quality of care in hospitals—volume, mortality, and utilisation. AHRQ pub. no. 02-RO204. Rockville,MD: AHRQ.

AIHW (Australian Institute of Health and Welfare) 2006. Residential aged care in Australia 2004–05: a statistical overview. Cat. no. AGE 45. Canberra: AIHW.

AIHW 2007a. Australian hospital statistics. Health services series no. 30. Cat. no. HSE 50. Canberra: AIHW.

AIHW 2007b. National palliative care performance indicators: results of the 2006 performance indicator data collection. Bulletin no. 54. Cat. no. Aus 94. Canberra: AIHW.

AIHW 2007c. Alcohol and other drug treatment services in Australia 2005–06: report on the National Minimum Data Set. Drug treatment series no. 7. Cat. no. HSE 53. Canberra: AIHW.

AIHW 2007d. Medical indemnity national collection public sector 2005–06. Cat. no. HSE 52. Canberra: AIHW.

AIHW 2007e. A national picture of medical indemnity claims in Australia 2004–05. Cat. no. HSE 48. Canberra: AIHW.

AIHW 2008 (pending). Mental health services in Australia 2005–06.

AIHW NPSU: Grayson N, Hargreaves J & Sullivan EA 2005. Use of routinely collected national data sets for reporting on induced abortion in Australia. Perinatal Statistics Series no 17. Cat. no. PER 30. Sydney: AIHW National Perinatal Statistics Unit.

Barnard PD, White J 2003. Dental Practice Survey, 2001. *ADA* News Bulletin 311:6–15.

Brennan DS, Spencer AJ 2002. Dentists' practice activity in Australia 1983–84 to 1998–99. Dental Statistics and Research Series no. 26. Cat. no. DEN 101. Canberra: AIHW.

Britt H, Miller GC, Charles J, Pan Y, Valenti L, Henderson J et al. 2007. General practice activity in Australia 2005–06. General practice series no. 19. Cat. no. GEP 19. Canberra: AIHW.

Britt H, Miller GC, Charles J et al. 2008. General practice activity in Australia 2006–07. Canberra: Australian Institute of Health and Welfare.

de Crespigny L & Savulescu J 2004. Abortion: time to clarify Australia's confusing laws. Medical Journal of Australia 181: 201–3.

DHS (Department of Human Services Victoria) 2002. The Victorian Ambulatory Care Sensitive Conditions study: opportunities for targeting public health and health services interventions. Melbourne: Rural and Regional Health and Aged Care Services Division.

Diabetes Australia 2007. Fact sheet: National Diabetes Services Scheme (NDSS) 30 June 2007. Viewed October 2007, <www.diabetesaustralia.com.au>.

DoHA (Department of Health and Ageing) 2002. Australian refined diagnosis related groups, version 5.0. Canberra: DoHA.

DoHA 2007a. Medicare statistics—June quarter 2007. Viewed November 2007, <www.health.gov.au>.

DoHA 2007b. Expenditure and prescriptions twelve months to 30 June 2007. Viewed January 2008, <www.healthconnect.gov.au>.

DoHA 2007c. National Diabetes Services Scheme (NDSS). Viewed September 2007, <www.health.gov.au>.

FIGO (International Federation of Gynecology and Obstetrics) 1999. FIGO Committee on the Ethical Aspects of Human Reproduction and Women's Health. International Journal of Gynecology and Obstetrics 64: 317–22.

Laws PJ, Grayson N & Sullivan EA 2006. Australia's mothers and babies 2004. Perinatal statistics series no. 18. Cat. no. PER 34. Sydney: AIHW National Perinatal Statistics Unit.

Medicare Australia 2005. Annual report 2004–05 and statistical tables. Viewed November 2007, < www.medicareaustralia.gov.au>.

Medicare Australia 2007. Annual report 2006–07 and statistical tables. Viewed November 2007, < www.medicareaustralia.gov.au >.

NCCH (National Centre for Classification in Health) 2004. The international statistical classification of diseases and related health problems, Tenth revision, Australian modification (ICD-10-AM), 4th edition. Sydney: University of Sydney.

NHPC (National Health Performance Committee) 2004. National report on health performance indicators. Canberra: AIHW.

NPHP (National Public Health Partnership) 1998. Public health in Australia: the public health landscape: person, society, environment. Melbourne: NPHP.

Office of Hearing Services 2007. unpublished data.

Petersen K 2005. Abortion in Australia: a legal misconception. Australian Health Review 29: 142–5.

PHIAC 2007. Private Health Insurance Administration Council Industry statistics. Viewed December 2007, <www.phiac.gov.au>.

Quality Improvement Council 1998. Australian health and community service standards: community and primary health care services module. Melbourne: Quality Improvement Council.

RFDS (Royal Flying Doctor Service) 2007. Royal Flying Doctor Service central operations 2006–07 annual report. Sydney: Australian Council of the RFDS.

Runcimann WB, Webb RK, Phelps SC, Thomas EJ, Sexton EJ, Studdert DM & Brennan TA 2000. A comparison of iatrogenic injury studies in Australia and the USA. II: reviewer behaviour and quality of care. International Journal of Quality in Health Care 12: 379–88.

Sanders AE, Slade GD & Carter KD, Stewart JF 2004. Trends in prevalence of complete tooth loss among Australians, 1979–2002. Australian and New Zealand Journal of Public Health 28: 549–54.

SCRGSP (Steering Committee for the Review of Government Service Provision) 2008. Report on government services 2008. Canberra: Productivity Commission.

Spencer AJ, Lewis JM 1986. Workforce participation and productivity of dentists in Australia. Melbourne: University of Melbourne.

WHO (World Health Organization) 2008. The Anatomical Therapeutic Chemical Classification System with Defined Daily Doses, <http://www.whocc.no/atcddd/>.

8 Expenditure and workforce

Key points

- Australia spent one in every 11 dollars on health in 2005–06, equalling $86.9 billion, 9.0% of gross domestic product (GDP).
- As a share of its GDP, Australia spent more in 2005 than the United Kingdom (8.3%), a similar amount to Italy (8.9%) and much less than the United States (15.3%).
- Health spending per person was 45% more in 2005–06 than a decade before, even after adjusting for inflation.
- For Indigenous Australians in 2004–05, health spending per person was 17% higher than for other Australians.
- Spending on medications increased by 1.6% between 2004–05 and 2005–06—much less than the average increase of 8.6% per year in the decade before.
- Health is a growing sector—between 2001 and 2006, the 23% growth in numbers employed in health occupations was almost double that for all occupations.
- The profile of the health workforce continues to age—in 2006, 16% of the workforce was aged 55 years and over compared with 12% in 2001.
- Compared with Major Cities, remote areas have less than half the supply of medical practitioners and dentists (number of 'full-time equivalents' per 100,000 population).
- Comparing 2005 with 1997, the overall supply of primary care doctors (mostly general practitioners) was about 9% lower—but in remote areas the supply was 15% higher.

A nation's health depends on the extent and quality of its health services and a range of other determinants of health, including socioeconomic and environmental conditions and the health behaviours of individual members in its society. Chapter 4 provides information on these other determinants of health and Chapter 9 discusses the health sector's performance. Chapter 7 describes the health services that are available in Australia.

This chapter focuses on two key aspects of those health services. Section 8.1 describes how health services are funded and how the funds are spent. Section 8.2 focuses on the health workforce and how it is distributed to support those services. These resources include:

- the funds available for expenditure on health—along with government funding, this includes non-government funding, such as payments by health insurance funds and by individuals through their out-of-pocket contributions
- the health sector's human resources, its capital resources, (such as hospital buildings and medical and other equipment), and the materials and energy consumed during service provision.

8.1 Health expenditure and health funding

This section describes the main components of health expenditure and who provides the health funding. It answers the following questions about health services in Australia:

- How much is spent on health?
- What are the trends in expenditure and funding during the decade up to 2005–06?
- Who provides funding for what types of services?
- How does Australia's health expenditure compare with that of other Organisation for Economic Co-operation and Development (OECD) countries?
- What is the average amount spent on each person and on specific population groups and diseases?
- What is spent on each type of health service and on health infrastructure and who spends it?
- What is the contribution of private health insurance?
- How much will health care cost in the future?

Two terms—'health expenditure' and 'health funding'—are used to describe financial resources used in health. They express concepts that are distinct but related (Box 8.1). Both concepts are needed to explain the financial resources used by the overall health system and those used by the various segments of the system (such as general practice or hospitals).

The bulk of health expenditure is on health goods and services, such as medications and hospital care. For the sake of reporting, health expenditure also includes spending on a number of health-related activities, such as research and administration. However, spending on such items as the training of health professionals and the cost to individuals of private health insurance premiums are not treated as health expenditure; the former is regarded as expenditure on education and the latter as expenditure on insurance.

Expenditure on health comprises recurrent and capital expenditure and depreciation (capital consumption), and together they are reported as total health expenditure. Recurrent expenditure, which relates largely to operating costs, is split according to the major types of health goods and services and health-related activities. Recurrent expenditure is also presented in this chapter for Aboriginal and Torres Strait Islander peoples and other Australians, and by disease. Capital expenditure relates to large-scale investment in plant and facilities that support health services, and it cannot readily be split further.

Box 8.1: Defining health expenditure and health funding

Health expenditure

Health expenditure is reported in terms of who spends the money rather than who ultimately provides the money for any particular expenditure. In the case of public hospital care, for example, all expenditure (on drugs, salaries of doctors and nurses, and so on) is incurred by the states and territories but the Australian Government and others share the funding with them.

Health funding

Health funding is reported in terms of who provides the funds that are used to pay for health goods and services. For example, in the case of public hospitals, the Australian Government funded 41.4% of expenditure in 2005–06 and the states and territories funded 50.6%, together providing over 90% of the funding. Other funding comes from private health insurers and from individuals who incur an out-of-pocket cost when they choose to be treated as private patients.

It is important to note that total expenditure is equal to total funding, as all expenditure has to be funded.

How much is spent on health and is it increasing?

One measure commonly used to describe the relative sizes of health systems in different countries is their expenditure on health expressed as a percentage of their expenditure on all goods and services (known as GDP). It is used to compare what a country spends on health goods and services with what it spends on all goods and services.

The estimated total expenditure on health in Australia in 2005–06 was $86,879 million, or 9.0% of GDP (Table 8.1). This was similar to the previous year, when health accounted for 9.05% of GDP. A decade earlier, expenditure on health was 7.5% of GDP.

Over the decade, estimated real growth in health expenditure (that is, after removing the effects of inflation) averaged 5.1% per year (Table 8.2). Real growth in expenditure is measured using 'constant prices' (see Box 8.2).

Note, the numbers presented in this report for total health expenditure and the health expenditure to GDP ratio, for 1995–96 to 2003–04, differ from those appearing in previous editions of *Australia's health* because they no longer include expenditure on high-level residential aged care. In accord with practices of other government agencies such as the Department of Finance, the AIHW now classifies all residential aged care as a welfare service. All data in this chapter for prior years, excluding data on future health care costs, have been revised accordingly.

Table 8.1: Total health expenditure and GDP, current prices, 1995–96 to 2005–06

Year	Total health expenditure ($m)	GDP ($m)	Ratio of health expenditure to GDP (%)
1995–96	39,047	518,144	7.5
1996–97	42,116	545,698	7.7
1997–98	44,802	577,373	7.8
1998–99	48,502	607,759	8.0
1999–00	52,442	645,058	8.1
2000–01	58,287	689,262	8.5
2001–02	63,448	735,714	8.6
2002–03	68,932	781,675	8.8
2003–04	73,945	840,285	8.8
2004–05	81,125	896,568	9.05
2005–06	86,879	966,442	9.0

Sources: AIHW 2007a; ABS 2007.

Just as prices can increase generally (general inflation), so can those for health items in particular (health inflation). If there is a difference between health inflation and general inflation, this can have an influence on the ratio of health expenditure to GDP. Australia's health inflation has outpaced general inflation in most years during the last decade. Between 1995–96 and 2005–06, health inflation averaged 3.1% a year, whereas the average rate of general inflation was 2.7% a year (AIHW 2007a).

Table 8.2: Total health expenditure and GDP, constant prices[(a)], and annual growth rates, 1995–96 to 2005–06

	Total health expenditure		GDP	
Year	**Amount ($m)**	**Growth rate (%)**	**Amount ($m)**	**Growth rate (%)**
1995–96	50,948	. .	647,659	. .
1996–97	54,015	6.0	673,099	3.9
1997–98	56,266	4.2	703,258	4.5
1998–99	59,393	5.6	739,629	5.2
1999–00	62,786	5.7	769,045	4.0
2000–01	68,090	8.4	784,017	1.9
2001–02	70,802	4.0	813,542	3.8
2002–03	74,334	5.0	839,187	3.2
2003–04	77,036	3.6	873,197	4.1
2004–05	81,125	5.3	896,568	2.7
2005–06	83,601	3.1	922,772	2.9
Average annual growth rates				
1995–96 to 1997–98		5.1		4.2
1997–98 to 2002–03		5.7		3.6
1995–96 to 2005–06		**5.1**		**3.6**

(a) See Box 8.2 for an explanation of constant price estimation.

Sources: AIHW 2007a; ABS 2007.

Box 8.2: Constant price and current price expenditure

The use of 'constant prices' is a way of comparing expenditure over time without the distorting effects of inflation. In general, the prices of most goods and services rise over time, although some goods become cheaper because of changes in technology or other factors.

'Current prices' refers to expenditure reported for any year, unadjusted for inflation.

To obtain 'constant prices', the 'current prices' for all years are adjusted to reflect the prices in a chosen reference year. This process enables more realistic comparisons of expenditure to be made over a number of years. 'Constant prices' are also referred to as 'real' expenditure and growth in turn is referred to as 'real growth in expenditure'.

Hence, using 'constant prices' the expenditure in different years can be compared on an equal dollar-for-dollar basis, and the comparison will reflect only the changes in the amount of health goods and services purchased, not the changes in prices of these goods and services caused by inflation. The reference year used in this report is 2004–05.

In contrast, changes in current price expenditure reflect changes in prices through inflation, as well as changes in the amount of health goods and services that are purchased.

Health care—who provides the funds?

Funding for health goods and services comes from different sources, including Australian Government and state/territory and local governments, non-government agencies and individuals.

The major two levels of government provide the bulk of the funding. Local governments also finance certain health services from their own revenue sources, but these are often difficult to distinguish from funds provided to them by state governments. Hence, funding for state and local governments is usually combined.

Australian Government

The Australian Government provides most of the funding for recurrent expenditure on:

- services provided by general practitioners and medical specialists (together known as 'medical services'), and services provided by other health practitioners that are covered or partly covered by Medicare. The Australian Government provided 79% of the funding for medical services in 2005–06 and 23% of the funding for 'other health practitioners'
- pharmaceuticals that are covered or partly covered by the Pharmaceutical Benefits Scheme (PBS) and Repatriation Pharmaceuticals Benefits Scheme (RPBS) (83% was contributed by the Australian Government for these in 2005–06)
- Aboriginal Community Controlled Health Organisations (100%)
- health research (67%).

The Australian Government also partly funds:

- public hospital services (42%) and public health activities such as infectious disease control and health promotion campaigns (54%), through direct funding and through

Specific Purpose Payments (SPPs) to the states and territories. The main health SPPs in 2005–06 were:

  - the Australian Health Care Agreements (AHCAs) (see 'Influence of health service funding agreements' for more details)
  - the Public Health Outcomes Funding Agreements
  - for the provision of highly specialised drugs to outpatients in public and private hospitals

- private hospitals, through subsidising private health insurance cover through incentive arrangements (amounting to 34% of the gross funding that is provided through private health insurance funds).

State and territory governments

State and territory governments (including local governments) provide funding for:

- community health services (81% of recurrent funding in 2005–06)
- patient transport (62%)
- public hospital services (51%)
- public health activities (43%).

State and territory governments also fund the regulation of various health activities.

Non-government

Non-government funding comes from:

- out-of-pocket funding by individuals
- benefits paid by private health insurance
- providers of compulsory motor vehicle third-party insurance
- workers compensation insurance.

Non-government sources provide funding for:

- aids and appliances (85% of recurrent funding in 2005–06)
- dental services (81%)
- private hospitals (59%)
- medications (47%).

Health-care funding—how much?

In 2005–06, government funding of health expenditure was $58,875 million (68% of total health expenditure), with the Australian Government contributing $37,229 million (43%) and state, territory and local governments contributing $21,646 million (25%). The non-government sector (households, private health insurance and other non-government sources) funded the remaining $28,004 million (32%) (Table 8.3).

In current prices, from 2004–05 to 2005–06, Australian Government funding of health expenditure increased by 5%, state, territory and local government funding increased by 12% and non-government funding increased by 7% (tables S43 and S44).

From 1995–96 to 2005–06, the relative shares of funding of total health expenditure remained fairly stable for both the government and non-government sectors (Table 8.3). Around two thirds of funding was provided by governments and a third by non-government providers.

Funding by private health insurance decreased from 11% to 7% over this period. This decline is mostly the result of the Australian Government private health insurance rebate scheme taking over some private health insurance funding (see the later section on 'Funding' under the 'Hospitals' section for further details).

Table 8.3: Total health expenditure by broad source of funds, as a proportion of total health expenditure, current prices, 1995–96 to 2005–06 (per cent)

	Government			Non-government				
Year	Australian Govern-ment[(a)]	State/ territory and local	Total	Health insurance funds	Individ-uals[(a)]	Other	Total	Total
1995–96	43.1	23.1	66.3	11.3	15.6	6.8	33.7	100.0
1996–97	41.2	24.6	65.8	11.2	16.4	6.6	34.2	100.0
1997–98	42.1	25.3	67.4	9.5	16.3	6.8	32.6	100.0
1998–99	43.3	23.8	67.1	7.9	17.2	7.8	32.9	100.0
1999–00	44.2	24.7	68.9	6.9	16.7	7.5	31.1	100.0
2000–01	44.3	23.3	67.6	7.1	18.0	7.3	32.4	100.0
2001–02	43.7	23.0	66.6	8.0	18.1	7.3	33.4	100.0
2002–03	43.5	24.0	67.4	7.9	17.3	7.4	32.6	100.0
2003–04	43.3	24.0	67.3	7.8	17.4	7.5	32.7	100.0
2004–05	43.8	23.8	67.7	7.4	17.3	7.6	32.3	100.0
2005–06	42.9	24.9	67.8	7.2	17.4	7.6	32.2	100.0
				Amount ($m)				
2005–06	37,229	21,646	58,875	6,284	15,086	6,634	28,004	86,879

(a) Australian Government and individuals' expenditure have been adjusted for tax expenditure (see Table S42).

Note: Components may not add to totals, because of rounding.

Source: AIHW 2007a.

Australian Government

In 2005–06, the Australian Government provided $37,229 million for health goods and services (43% of total expenditure) (Table 8.3). The three areas in which the Australian Government contributed the most funding were medical services ($12,239 million), public hospital services ($10,105 million) and benefit-paid pharmaceuticals ($6,046 million) (Table S44). Much of this funding was provided through Medicare, the AHCAs and the PBS and RPBS (see Box 8.3).

The Australian Government Medicare levy raised $6,525 million in 2005–06 (Table S41). This was equivalent to 18% of the Australian Government's total recurrent health funding for that year.

Box 8.3: Medicare levy

All Australian Government funding for health services comes from its general revenues, one part of which is notionally health-related—the Medicare levy. In 2005–06, this levy funded the equivalent of 17.8% of total recurrent health funding by the Australian Government.

The levy was introduced in 1984 and was originally set at 1.0% of taxable income. It has increased several times since then and is currently set at 1.5% of taxable income. It has also been subject to one-off surcharges from time-to-time to cover non-health initiatives of the Australian Government.

Since October 1997, a further surcharge of 1.0% has been levied on 'high-income' earners (individuals earning more than $50,000 per year and couples earning more than $100,000 per year) who do not have private insurance cover for hospital care.

State/territory and local governments

The bulk of funding from the remaining two levels of government comes from state/territory governments, with local governments contributing some of the funding for public and community health services. In 2005–06, these two levels of government provided $21,646 million for health goods and services (25% of total expenditure) (Table 8.3). State/territory and local governments were the major source of funding for community health services ($3,167 million) and patient transport services ($899 million). Nationally, more than half of the funding by state/territory and local governments was directed to public hospital services ($12,374 million or 57% of total state/territory and local government health funding for 2005–06) (Table S44).

Non-government sources

In 2005–06, around one-third of funding on health goods and services was provided by the non-government sector ($28,004 million or 32% of total expenditure) (Table 8.3). Just over half of this funding came from out-of-pocket payments by individuals ($15,086 million or 17%). This included circumstances where individuals met the full cost of a service or good, as well as where they shared the funding of goods and services with third-party payers—for example, with private health insurance funds or the Australian Government. In this case, private health insurance funds provided $6,284 million of funding and the remaining $6,634 million came from other non-government sources (mainly compulsory third-party motor vehicle and workers compensation insurers).

Non-government sources provided the bulk of funding for dental services ($4,342 million) and aids and appliances ($2,378 million). Funding for medications was shared mainly between the Australian Government ($6,117 million) and individual out-of-pocket payments ($5,276 million) (Table S44).

Over the decade from 1995–96, funding by private health insurance funds decreased from 11% to 7% of total health expenditure (Table 8.3). This reflected the 30% rebate for private health insurance from the Australian Government. Private health insurance benefits that were previously funded almost entirely by private health insurance premiums were instead funded 30% by the Australian Government. In 2005–06, 4% of total health expenditure was funded by the Australian Government's 30% rebate and 7% was funded through private health insurance funds (AIHW 2007a).

How does Australia's health expenditure compare with other OECD countries?

For this international comparison, health expenditure per person figures are expressed in Australian dollar values and are calculated after adjusting for differences in the purchasing powers of national currencies, based on broad GDP purchasing power parities (see Box 8.4).

The OECD median health to GDP ratio for 1995, 2000 and 2005 was respectively 7.5%, 8.1% and 9.0% (Table 8.4). Australia's ratio was similar for these periods—slightly lower in 1995 (7.4%), higher in 2000 (8.3%) and lower in 2005 (8.8%).

Australia's health to GDP ratio in 2005 was comparable to Italy's (8.9%) and New Zealand's (9.0%), was more than the United Kingdom's (8.3%) and much lower than the United States (15.3%), which had by far the highest ratio (Figure 8.1).

Australia's average per person expenditure on health was higher than the OECD median in each of the 3 years reported (Table 8.4). In 2005 it was $4,121 per person, which was similar to that of Denmark, Greece and Ireland—all far below the United States at $8,833.

Australia's per person out-of-pocket expenditure for health was the same as the median for OECD countries in 1995 ($335 in current prices) and $155 above it in 2005 (Table S51). As a percentage of total health expenditure and total household expenditure, Australia's out-of-pocket expenditure rose between the two periods from 16% to 18% and from 2% to 3%, respectively. For the OECD as a whole, although out-of-pocket expenditure remained about the same as a percentage of total household expenditure (3%), the weighted average fell as a percentage of total health expenditure (17% to 16%) between 1995 and 2005.

Government health expenditure in 2005 as a proportion of GDP was 5.9% in Australia, 1 percentage point below the OECD median, and lower than the 6.9% of GDP that the United States governments spend on health (Table S49).

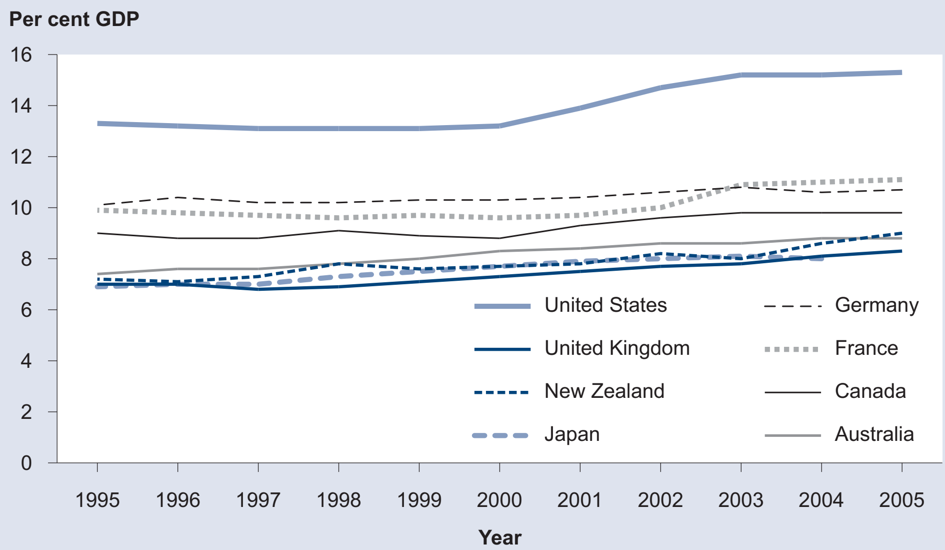
Box 8.4: OECD definition of health expenditure

This section uses a slightly different definition of health expenditure from the rest of the chapter. This is because for national reporting Australia uses the concept of health expenditure that was adopted by the World Health Organization (WHO) in the 1970s. Recently, however, the OECD and WHO have adopted the OECD's System of Health Accounts (International Classification of Health Accounts) as the basis for international reporting of health expenditure. The major difference is the exclusion by the OECD of expenditure on health research and development, food standards and hygiene, and environmental health.

For this international comparison, the estimates of Australia's total health expenditure have been adjusted to fit the OECD's System of Health Accounts framework. Therefore, they differ somewhat from those used elsewhere in this chapter.

Despite recent moves to standardise the international reporting of health expenditure, there continue to be some small differences between countries in terms of what is included as 'health goods and services'. Consequently, although comparative reporting of health expenditure is becoming more and more meaningful, readers are urged to be cautious in drawing conclusions from these comparisons.

Australia's three tiers of government funded 67.0% of total health expenditure in 2005, which was 9.2 percentage points below the OECD median of 76.2%. Over the decade, the Australian governments' contribution to health care increased less than that of the OECD governments overall (1 percentage point and 1.9 percentage points respectively).



Sources: AIHW 2007a; OECD 2007.

Figure 8.1: Health expenditure as a proportion of GDP, selected OECD countries, 1995 to 2005

Table 8.4: Health expenditure[(a)] as a proportion of GDP and per person, OECD countries, 1995, 2000 and 2005

Country	1995		2000		2005[(b)]	
	Health to GDP (%)	Per person (A$)	Health to GDP (%)	Per person (A$)	Health to GDP (%)	Per person (A$)
United States	13.3	4,826	13.2	5,985	15.3	8,833
Switzerland	9.7	3,394	10.4	4,167	11.6	5,764
France	9.9	2,726	9.6	3,258	11.1	4,656
Germany	10.1	2,937	10.3	3,451	10.7	4,536
Belgium	8.2	2,416	8.6	3,014	10.3	4,677
Austria	9.8	2,970	10.0	3,701	10.2	4,856
Portugal	7.8	1,447	8.8	2,129	10.2	2,806
Greece	7.5	1,650	9.3	2,555	10.1	4,114
Canada	9.0	2,715	8.8	3,287	9.8	4,590
Iceland	8.2	2,446	9.3	3,533	9.5	4,751
Denmark	8.1	2,433	8.3	3,119	9.1	4,289
Norway	7.9	2,497	8.4	4,037	9.1	6,022

(continued)

Table 8.4 (continued): Health expenditure[(a)] as a proportion of GDP and per person, OECD countries, 1995, 2000 and 2005

	1995		2000		2005[(b)]	
Country	Health to GDP (%)	Per person (A$)	Health to GDP (%)	Per person (A$)	Health to GDP (%)	Per person (A$)
Sweden	8.1	2,288	8.4	2,976	9.1	4,027
New Zealand	7.2	1,642	7.7	2,103	9.0	3,233
Italy	7.3	2,062	8.1	2,722	8.9	3,494
Australia[(c)]	**7.4**	**2,111**	**8.3**	**2,956**	**8.8**	**4,121**
United Kingdom	7.0	1,827	7.3	2,435	8.3	3,759
Spain	7.4	1,575	7.2	1,991	8.2	3,112
Turkey	3.4	247	6.6	591	7.6	809
Finland	7.5	1,886	6.6	2,249	7.5	3,217
Ireland	6.7	1,599	6.3	2,387	7.5	4,038
Czech Republic	7.0	1,208	6.5	1,272	7.2	2,041
Slovak Republic	. .	. .	5.5	779	7.1	1,569
Mexico	5.6	512	5.6	663	6.4	932
Poland	5.5	550	5.5	773	6.2	1,196
Korea	4.1	701	4.8	1,022	6.0	1,819
Hungary	7.3	904	6.9	1,123	n.a.	n.a.
Japan	6.9	2,041	7.7	2,577	n.a.	n.a.
Luxembourg	5.6	2,682	5.8	3,909	n.a.	n.a.
Netherlands	8.3	2,404	8.0	2,958	n.a.	n.a.
Weighted average (29 countries)[(d)(e)]	**9.6**	**2,485**	**9.9**	**3,136**	**11.1**	**4,485**
Median (29 countries)[(d)]	**7.5**	**2,062**	**8.1**	**2,722**	**9.0**	**4,038**

(a) See OECD definition of health expenditure in Box 8.4.

(b) OECD year 2005. For Australia, this is financial year 2005–06, and similarly for OECD years 1995 and 2000.

(c) Expenditure based on the OECD System of Health Accounts (SHA) framework.

(d) Excludes the Slovak Republic. Averages for 2005 incorporate 2004 data for Hungary, Japan, Luxembourg and the Netherlands.

(e) Average weighted by GDP or population.

Note: Expenditure converted to Australian dollar values using GDP purchasing power parities.

Sources: AIHW 2007a; OECD 2007.

How much is health expenditure per person?

In 2005–06, Australia spent around $4,226 per person on average on health (Table 8.5). This includes expenditure funded by government, by non-government organisations such as private health insurance funds, and by individuals through out-of-pocket expenses. After adjustment for inflation, per person health expenditure grew at an average of 3.8% per year between 1995–96 and 2005–06.

From 2003–04 to 2005–06, estimated per person expenditure on health grew at an average of 2.8% per year. Four jurisdictions—Tasmania (5.6%), Northern Territory (5.3%), Western Australia (3.6%) and Victoria (2.9%)—all had annual growth rates that were higher than the national average (Table 8.6).

Table 8.5: Average health expenditure per person[(a)], current and constant prices[(b)], and annual growth rates, 1995–96 to 2005–06

	Amount ($)		Growth (%)	
Year	Current	Constant	Current	Constant
1995–96	2,146	2,800	. .	. .
1996–97	2,286	2,932	6.5	4.7
1997–98	2,407	3,022	5.3	3.1
1998–99	2,577	3,156	7.1	4.4
1999–00	2,754	3,297	6.9	4.5
2000–01	3,023	3,531	9.8	7.1
2001–02	3,247	3,624	7.4	2.6
2002–03	3,485	3,758	7.3	3.7
2003–04	3,692	3,847	6.0	2.4
2004–05	4,001	4,001	8.4	4.0
2005–06	4,226	4,066	5.6	1.6
Average annual growth rate				
1995–96 to 1997–98			*5.9*	*3.9*
1997–98 to 2002–03			*7.7*	*4.5*
1995–96 to 2005–06			**7.0**	**3.8**

(a) Based on annual average resident population.

(b) Constant price health expenditure for 1995–96 to 2005–06 is expressed in terms of 2004–05 prices.

Source: AIHW 2007a.

Table 8.6: Average health expenditure per person[(a)] by state/territory[(b)], constant prices[(c)], 2003–04 to 2005–06 ($)

State/territory[(d)]	2003–04	2004–05	2005–06	Average annual growth rate 2003–04 to 2005–06 (%)
NSW	3,859	4,008	4,070	2.7
Vic	3,865	4,023	4,093	2.9
Qld	3,710	3,762	3,867	2.1
WA	3,865	4,114	4,149	3.6
SA	3,950	4,216	4,111	2.0
Tas	3,561	3,750	3,974	5.6
NT	4,616	4,850	5,122	5.3
Australia	**3,847**	**4,001**	**4,066**	**2.8**

(a) Based on annual average resident population.

(b) Per person expenditure includes all monies spent on health within a state/territory regardless of funding source. That is, it includes expenditure funded by the Australian Government, by state/territory and local governments and by non-government.

(c) See Box 8.2 for explanation of constant price estimation.

(d) ACT per person figures are not included, as the expenditure estimates for the ACT include substantial expenditure for NSW residents. Thus, the ACT population is not an appropriate denominator.

Source: AIHW Health Expenditure Database.

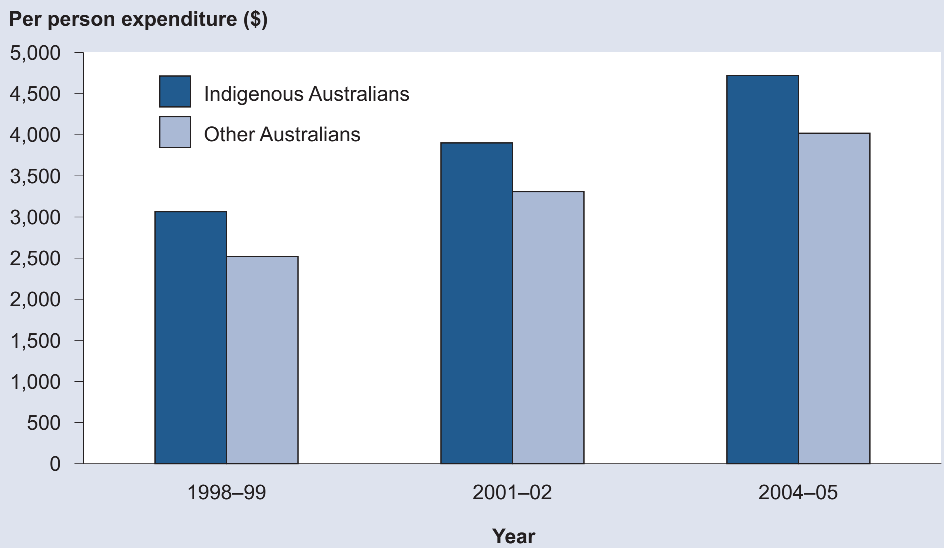
How much is spent on health services for Aboriginal and Torres Strait Islander peoples?

Information on aspects of health status and risk factors for Indigenous people is available in Chapters 3 and 4; and Chapter 5 examines some aspects of diseases and injury for this group. This section presents how much is spent on health services for Aboriginal and Torres Strait Islander peoples. The expenditure can be viewed in the context of the lower health status of Indigenous people—life expectancy for Indigenous people for the period 1999–2001 was some 17 years lower than life expectancy estimates for the total Australian population (AIHW 2007b).

Estimates of recurrent expenditure on health for Aboriginal and Torres Strait Islander peoples have been undertaken at 3-year intervals. The latest in the series relates to the year 2004–05 (AIHW 2008).

In 2004–05, recurrent expenditure on health for Indigenous peoples was estimated at $2,304 million or nearly 3% of recurrent health expenditure for the entire population (tables S47 and S43). That represents an average of $4,718 per Indigenous person, 17% higher than the average of $4,019 for other Australians (AIHW 2008). This was about the same ratio as in 2001–02 and 1998–99 (18% and 22% higher respectively) (Figure 8.2).

There were substantial differences between the patterns of expenditure on Aboriginal and Torres Strait Islander peoples' health and that on the health of other Australians. Indigenous people were more likely than other Australians to use the kinds of health services for which states and territories are mainly responsible (such as admitted patient services in public hospitals and community health services). On a per person basis, expenditure on Indigenous people for state and territory services was 2.3 times that spent on other people.

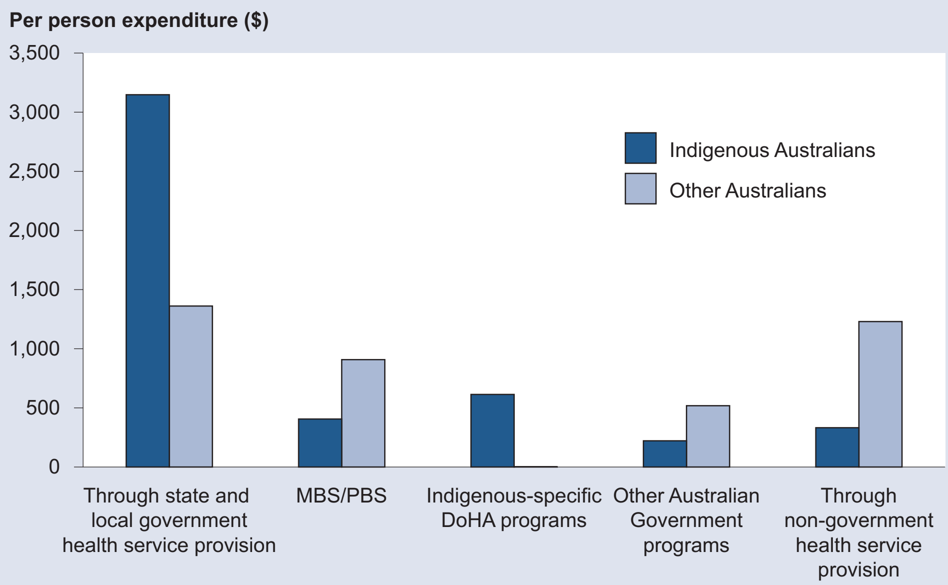


Source: AIHW Health Expenditure Database.

Figure 8.2: Health expenditure per person for Indigenous and other Australians, 1998–99 to 2004–05

For the two major Australian Government funding programs, namely Medicare and the PBS, average expenditure per person on Aboriginal and Torres Strait Islander peoples was less than half (44%) that on other Australians (Figure 8.3). If spending on Indigenous-specific Australian Government programs such as Aboriginal Community Controlled Health Services is included, the overall Indigenous/other Australians expenditure ratio for Australian Government programs in 2004–05 was 0.87:1 (AIHW 2008).

Average per person expenditure on private services (that is, services neither provided nor managed by the Australian Government or state or territory governments), such as private hospital services, private dental services and services provided by other health practitioners, was also much lower for Indigenous people than for other Australians. The Indigenous/other Australians expenditure ratio for all non-government health goods and services combined was estimated at 0.27:1 (AIHW 2008).



Note: MBS/PBS also includes co-payments for these services from individuals.

Source: AIHW Health Expenditure Database.

Figure 8.3: Health expenditure per person for Indigenous and other Australians by program, 2004–05

What is spent on health services for veterans?

In 2005–06, funding by the Department of Veterans' Affairs (DVA) on health totalled $3,126 million (Table 8.7), which was 3.9% of recurrent health expenditure for the entire population. This funding related largely to services for veterans, war widows and widowers. The largest amount of DVA funding was for hospitals ($684 million for public hospital services and $834 million for private hospitals), medical services (comprising payments to GPs and specialists who are registered with DVA) ($767 million), and medications ($468 million). As a proportion of total recurrent health expenditure, DVA funding of private hospitals and patient transport were the largest components (13% and 7% respectively).

Note that elsewhere in this chapter, DVA funding is included in total funding by the Australian Government and not separately identified.

Table 8.7: DVA health funding[(a)] by area of expenditure, 2005–06

Area of expenditure	Amount ($m)	Proportion of DVA health funding (%)	Proportion of total recurrent health expenditure[(b)] (%)
Public hospital services[(c)]	684	21.9	2.8
Private hospitals	834	26.7	12.5
Patient transport	96	3.1	6.7
Medical services	767	24.5	4.9
Dental services	86	2.7	1.6
Other health practitioners	132	4.2	4.4
Community health	2	. .	. .
Medications	468	15.0	4.1
Aids and appliances	1	. .	. .
Administration	55	1.8	2.2
Research	2	0.1	0.1
Total	**3,126**	**100.0**	**3.9**

(a) Actual expense for 2005–06. Note these figures exclude some funding for non-health expenditure that is included in Table 8.8.

(b) Proportion of total recurrent health expenditure for each area of expenditure.

(c) Public hospital services excludes dental services, community health services, patient transport, public health and health research undertaken by public hospitals. Can include services provided off the hospital site such as hospital-in-the-home dialysis or other services.

Source: DVA, unpublished data.

DVA-administered health funding increased, in real terms, by 63% from 1996–97—from $2,069 million to $3,366 million in 2005–06 (Table 8.8). During the same period, the veteran population eligible to receive this funding decreased by 10% and the number of gold card holders decreased by 3% (Gold card holders are people entitled to the full range of health-care services at DVA expense, including medical, dental and optical care).

Table 8.8: DVA health funding[a], current and constant prices[b], the eligible veteran population and number of gold card holders, 1996–97 to 2005–06

Year	DVA-administered health funding: Current prices ($ million)	DVA-administered health funding: Constant prices ($ million)	Eligible veteran population[c] at 30 June (number)	Gold card holders at 30 June (number)
1996–97	1,600	2,069	340,327	258,562
1997–98	1,800	2,279	339,310	257,567
1998–99	2,000	2,469	353,840	291,622
1999–00	2,300	2,773	348,996	287,066
2000–01	2,500	2,957	345,131	283,925
2001–02	2,700	3,019	340,716	281,448
2002–03	3,000	3,232	335,160	277,747
2003–04	3,200	3,331	325,798	269,544
2004–05	3,400	3,400	316,333	260,864
2005–06	3,500	3,366	305,229	250,957

(a) Excludes residential aged care subsidy, salaries and administration and certain minor items not directly related to veteran health care (for example, health research).

(b) See Box 8.2 for explanation of constant price estimation.

(c) Includes gold and white card holders. White card holders are entitled to the full range of health-care services at DVA expense, but generally only for those disabilities or illnesses accepted as service-related.

Sources: DVA Annual Reports and DVA unpublished data.

How much is spent on each type of disease and injury?

This section provides an overview of how health expenditure in Australia is distributed among disease and injury groups. The estimates were derived using a method that ensures that they add across disease, age and sex groups to the total Australian health system expenditure for 2004–05 that was able to be allocated by disease (AIHW in press). The estimates provide a useful description of the use and costs of health services in Australia, as well as a reference source for planners and researchers interested in costs and use patterns for particular disease groups.

There are a number of points to note when using disease expenditure data. The estimates:

- are only one measure of the size of the disease burden on the community (that is, the 'size of the problem')
- are not the same as loss of health because of disease
- do not mean that the disease with the highest expenditure should necessarily be the top priority for intervention
- should not be regarded as how much would be saved if a specific or all diseases were prevented
- are not an estimate of the total economic impact of diseases in the Australian community. This is because the estimates do not include costs that are not accrued by the health system, such as travel costs of patients, costs associated with the social and economic burden on carers and family, and costs owing to lost quality and quantity of life.

In 2004–05, total health expenditure in Australia was $81.1 billion. Of this, estimates for disease expenditure were able to be allocated for $52.7 billion (65%). The remaining $28.4 billion of health expenditure which could not be allocated by disease included recurrent expenditure of $23.7 billion for:

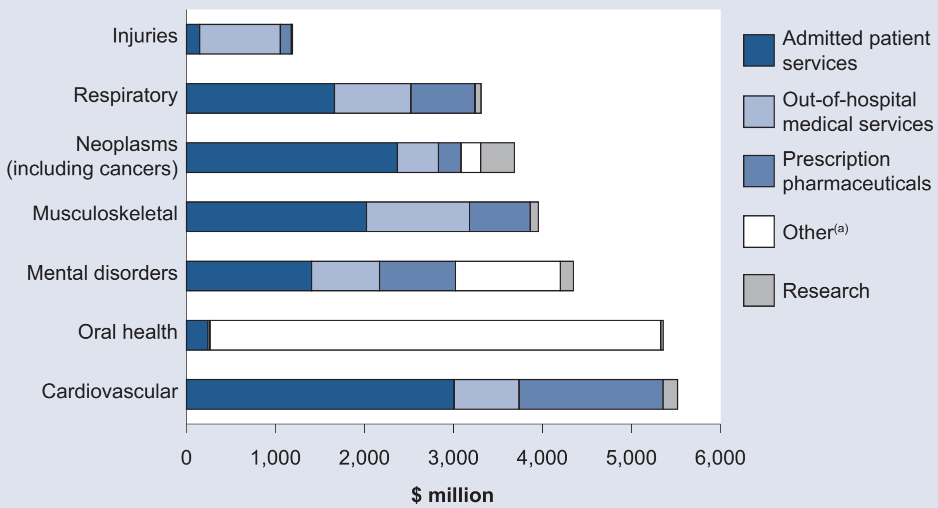
- hospital non-admitted patient services
- community health, excluding community mental health
- public health, excluding cancer screening programs
- health administration
- other health practitioner services, excluding optometry
- non-prescription medications
- patient transport services
- health aids and appliances.

It also included capital expenditure of $4.7 billion.

Which diseases have the most spent on them?

Seven broad disease groups accounted for an estimated $29,827 million, or 57% of the allocatable health expenditure in Australia in 2004–05 (Table 8.9). Cardiovascular disease was the most expensive disease group ($5,923 million or 11% of expenditure) and oral health was the second most expensive ($5,305 million or 10%).

Different illnesses have different patterns of expenditure by type of health service (Figure 8.4). For cardiovascular diseases, musculoskeletal diseases, cancers and other neoplasms and injuries, expenditure on hospital admitted patient services accounted for a relatively high proportion of total expenditure.



(a) Includes dental services.

Source: AIHW in press.

Figure 8.4: Expenditure on disease by area of expenditure for selected broad disease groups, 2004–05 ($ million)

Table 8.9: Diseases and injury by broad groups: health system costs by area of health expenditure, 2004–05 ($ million)

Broad groups	Admitted patient services[(a)]	Out-of-hospital medical services	Dental services	Prescription pharma-ceuticals[(b)]	Other[(c)]	Research	Total health expenditure allocated by disease	Proportion of total allocated expenditure (%)
Cardiovascular	3,009	1,114	. .	1,636	. .	164	5,923	11.2
Oral health	186	22	5,064	6	. .	27	5,305	10.1
Mental disorders	1,411	543	. .	854	1,177	148	4,133	7.8
Musculoskeletal	2,003	1,178	. .	680	. .	92	3,954	7.5
Neoplasms (including cancers)	2,381	569	. .	236	222	378	3,786	7.2
Respiratory	1,477	1,049	. .	725	. .	69	3,321	6.3
Genitourinary	1,431	780	. .	111	. .	24	2,346	4.5
Digestive system	1,849	447	. .	764	. .	48	3,107	5.9
Nervous system	985	775	. .	464	218	291	2,732	5.2
Endocrine, nutritional & metabolic	448	501	. .	1,042	. .	110	2,101	4.0
Maternal conditions	1,539	117	. .	4	. .	12	1,672	3.2
Skin diseases	398	452	. .	102	. .	13	964	1.8
Infectious & parasitic	482	458	. .	199	. .	184	1,323	2.5
Injuries	2,422	845	. .	124	. .	14	3,405	6.5
Diabetes	371	288	. .	275	. .	55	989	1.9
Neonatal causes	422	21	. .	1	. .	12	456	0.9
Congenital anomalies	209	25	. .	2	. .	54	290	0.6
Signs, symptoms, ill-defined conditions and other contact with health system[(d)]	3,195	2,717	. .	919	. .	22	6,853	13.0
Total	**24,221**	**11,900**	**5,064**	**8,144**	**1,616**	**1715**	**52,660**	**100.0**
Proportion of total allocated expenditure (%)	**46.0**	**22.6**	**9.6**	**15.5**	**3.1**	**3.3**	**100.0**	

(a) Public and private acute hospitals, and psychiatric hospitals. Includes medical services provided to private admitted patients in hospital.

(b) Includes all pharmaceuticals for which a prescription is needed, including benefit-paid prescriptions, private prescriptions and under co-payment prescriptions.

(c) Includes optometry services, community mental health, and breast and cervical screening programs.

(d) Includes services for signs, symptoms and ill-defined conditions where cause of problem is unknown. 'Other contact with the health system' includes fertility control, reproduction and development; elective plastic surgery; general prevention, screening and health examination; and treatment and aftercare for unspecified disease.

Source: AIHW in press.

Spending differences according to age and sex

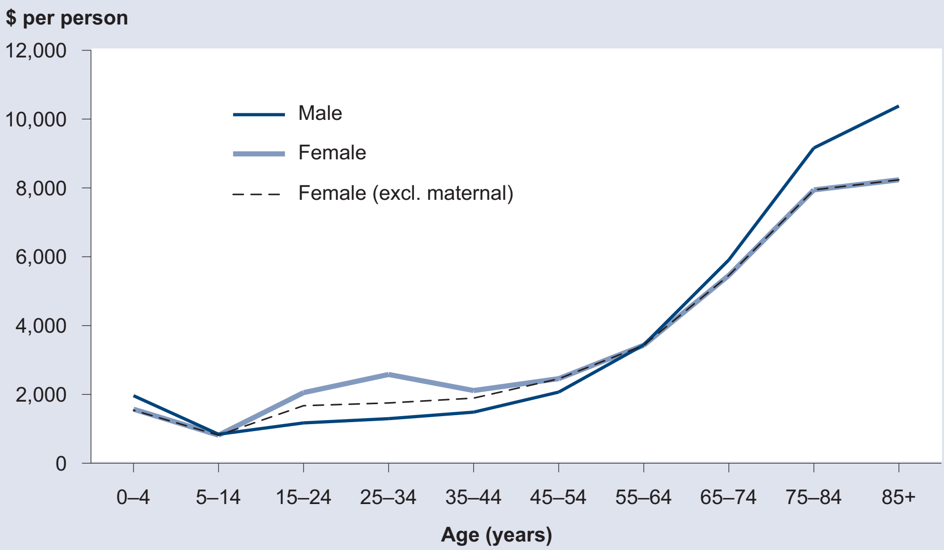
Health system expenditure allocated by disease was 18% higher for females than for males—$28.5 billion compared with $24.1 billion. Expenditure per person was $2,781 for females, which was 17% higher than the $2,377 for males. When maternal conditions are excluded, expenditure per person for females was 10% higher than for males (Table 8.10).

This remaining difference for females largely reflects the fact that there are more women than men in the older age groups, where expenditure is highest.

In 2004–05, total allocated health expenditure for males was higher than for females for the young age groups (up to 14 years) and for the older age groups (from 55 years onwards). In contrast, total allocated health expenditure for females was higher than males for the age groups between 15 and 54 years, reflecting costs for child bearing and health expenditure related to the genitourinary system (Figure 8.5). If the effect of the larger number of females at older age groups is eliminated by comparing males and females in the same age groups, the per person pattern of health expenditure was similar for both sexes with the exception of the peak for females at ages 25–34.

Expenditure per person for mental disorders was generally higher for females than males. It was generally higher for males for cardiovascular disease (Table 8.10).

Total allocated health expenditure per person in 2004–05 ranged from $790 for females aged 5–14 years to $10,588 for males aged 85 years and over. The male–female difference in per person cost was the greatest, in dollar terms, for the 85 and over age group ($10,588 for males and $8,553 for females) (Table 8.10).



Source: AIHW in press.

Figure 8.5: Allocated health expenditure per person by age and sex, 2004–05 ($)

Table 8.10: Allocated health expenditure per person by age, sex and broad disease groups, 2004–05 ($)

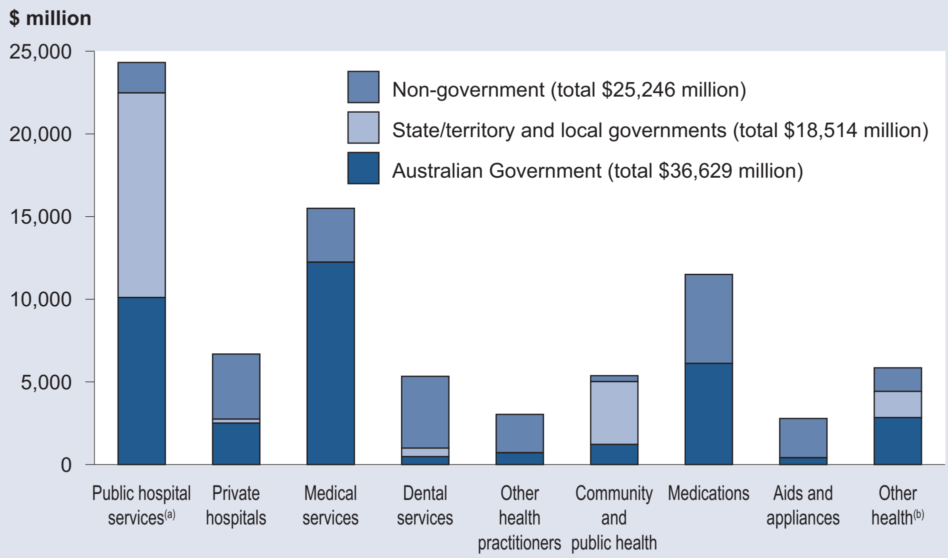
Selected broad disease groups and sex	Age group										
	0–4	5–14	15–24	25–34	35–44	45–54	55–64	65–74	75–84	85+	Total
Cardiovascular											
Male	11	7	14	37	94	276	653	1,336	1,998	2,096	321
Female	8	7	14	34	77	184	416	865	1,517	1,604	260
Oral health											
Male	335	264	409	261	184	157	172	174	180	125	242
Female	301	281	650	314	195	166	156	178	160	122	278
Mental disorders											
Male	75	30	205	306	268	220	197	170	227	243	196
Female	23	47	216	278	273	248	221	237	271	204	209
Musculoskeletal											
Male	16	28	53	76	125	190	327	515	655	514	169
Female	15	26	40	67	114	225	421	708	876	585	218
Neoplasms (including cancers)											
Male	32	19	22	30	60	133	350	733	1,120	1,121	182
Female	32	18	34	59	117	242	357	586	615	544	189
Respiratory											
Male	350	116	74	72	79	94	178	364	679	894	164
Female	260	100	96	86	97	120	194	316	463	509	162
Injuries											
Male	83	102	204	164	140	142	178	265	505	885	178
Female	65	66	90	84	90	110	152	271	625	1,154	156
Maternal conditions											
Female	23	1	307	662	177	3	—	—	—	—	163
Total											
Male	**1,968**	**818**	**1,285**	**1,367**	**1,530**	**2,080**	**3,477**	**5,972**	**9,155**	**10,588**	**2,377**
Female	**1,618**	**790**	**2,014**	**2,390**	**2,028**	**2,420**	**3,436**	**5,510**	**8,060**	**8,553**	**2,781**
Female (excl. maternal)	**1,595**	**789**	**1,707**	**1,729**	**1,851**	**2,417**	**3,436**	**5,510**	**8,060**	**8,553**	**2,618**

Source: AIHW in press.

How much was spent on each kind of health service and who provided the funding?

This section is derived from *Health expenditure Australia 2005–06* (AIHW 2007a) which contains more detailed information on health expenditure and funding. Recurrent expenditure on health in 2005–06 was estimated at $80,389 million (92.5% of total health expenditure). The largest component was expenditure on hospital services, totalling $31,003 million (39% of recurrent expenditure) (Table S44; Figure 8.6).

The next largest component was medical services, comprising mainly services provided by registered general practitioners and specialists, excluding those provided to public admitted patients or public outpatients in public hospitals ($15,499 million or 19% of recurrent health expenditure). Medications (excluding those dispensed in hospitals) came next at $11,501 million or 14%. Expenditure on dental services ($5,337 million) and community health ($3,899 million) accounted for 7% and 5%, respectively.



(a) Public hospital services excludes dental services, community health services, patient transport services, public health and health research undertaken by the hospital. Can include services provided off the hospital site such as hospital-in-the-home dialysis or other services.

(b) Other health comprises patient transport services, administration and research.

Source: AIHW Health Expenditure Database.

Figure 8.6: Recurrent health expenditure by area of expenditure and source of funds, 2005–06

Hospitals

Expenditure

In 2005–06, hospital expenditure was $31,003 million. Expenditure on public hospital services represented $24,319 million or 78% of all expenditure on hospitals during 2005–06, with the balance, $6,683 million or 22%, spent on private hospitals (Table S45).

In real terms, expenditure on hospitals (both public and private) grew by 4.8% per year between 1995–96 and 2002–03, and by 4.2% between 2003–04 and 2005–06 (Table S45).

For public hospitals, real growth in expenditure was 4.6% per year from 1995–96 to 2002–03. For public hospital services, expenditure increased on average by 4.9% per year from 2003–04 to 2005–06 (see explanation of expenditure relating to public hospitals in the 'Breaks in series' section below).

Real growth in expenditure on private hospitals was slightly lower at 4.5% each year between 1995–96 and 2005–06.

Public hospitals in this report include public psychiatric hospitals, which are public hospitals that cater almost exclusively for the needs of people with mental illness.

Table 8.11: Recurrent expenditure on hospitals[a] by source of funds, current prices, 1995–96 to 2005–06 (per cent)

	Government				
Year	Australian Government[b]	State/territory and local	Total	Non-government[b]	Total
1995–96	37.4	35.9	73.3	26.7	100.0
1996–97	35.6	38.1	73.7	26.3	100.0
1997–98	38.2	38.2	76.4	23.6	100.0
1998–99	41.9	36.0	77.9	22.1	100.0
1999–00	43.8	35.8	79.6	20.4	100.0
2000–01	45.0	34.9	79.8	20.2	100.0
2001–02	44.0	35.0	79.0	21.0	100.0
2002–03	43.5	37.5	81.1	18.9	100.0
2003–04	42.6	38.0	80.6	19.4	100.0
2004–05	42.3	38.4	80.7	19.3	100.0
2005–06	40.6	40.5	81.1	18.9	100.0

(a) Includes public and private hospitals. For public hospitals, this includes dental services, community health services, patient transport services, public health and health research undertaken by public hospitals.

(b) Funding by the Australian Government and private health insurance funds has been adjusted for the private health insurance rebate.

Note: Components may not add to totals, because of rounding.

Source: AIHW Health Expenditure Database.

Breaks in series

There have been changes in methods which have led to a break in time series information for both public and private hospitals. As a result, public hospital expenditure from 2003–04 onwards cannot be compared with that from previous years. Similarly, caution should be used when comparing private hospital expenditure from 2002–03 onwards with that from previous years.

Public hospitals and public hospital services

Information on public hospitals expenditure (and its funding) before 2003–04 is referred to as public hospitals expenditure and from 2003–04 onwards is referred to as public hospital services expenditure, because they do not contain all the same elements as each other (for more information, see AIHW 2007a).

However, note that the public hospitals expenditure data for years 2003–04 to 2005–06 presented in tables 8.11 and 8.12 and figures 8.7 and 8.8 used the same calculations as those used for the pre-2003–04 method, to enable comparisons of public hospitals expenditure across the decade. Therefore, expenditure data in these tables for the years 2003–04 to 2005–06 refer to public hospitals expenditure, not public hospital services expenditure.

Private hospitals

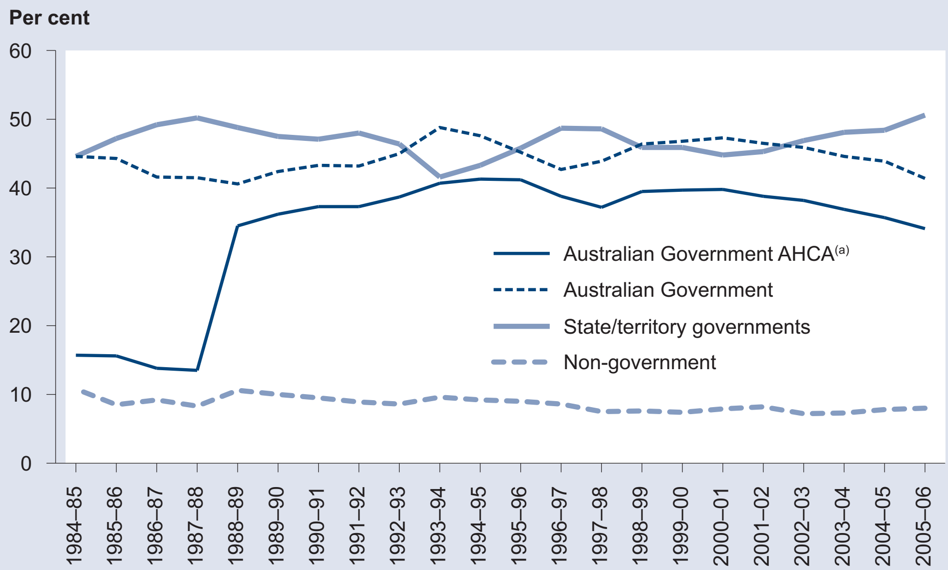
From 2002–03, state and territory governments began identifying their purchases of services from private hospitals as part of their funding of private hospitals expenditure. This change in practice resulted in a change in the estimated state/territory share of funding of hospital expenditure from 35% in 2001–02 to over 37% in 2002–03 and a corresponding drop in the non-government share of funding of this expenditure (Table 8.11).

Funding

In 2005–06, governments accounted for most of hospital funding (81%) (Table 8.11). Over the decade to 2005–06, governments increased their share of hospital funding by 7.8 percentage points—the Australian Government by 3.2 percentage points and the states and territories by 4.6 percentage points. At the same time the non-government funding of public and private hospitals decreased from 26.7% to 18.9%.

Of this 7.8 percentage point increase in the share of government funding over the decade, 5.6 percentage points were the effect of the Australian Government private health insurance subsidy/rebate taking over some of the funding of private health insurance.

The Private Health Insurance Incentives Scheme Subsidy was introduced in 1997, and replaced by a 30% rebate on premiums in January 1999 (Box 8.5). These Australian Government policy measures were aimed at arresting a long-term decline in membership of private health insurance funds. As a result, the Australian Government's share of funding for hospitals increased to 45% by 2000–01, from 36% in 1996–97 (Table 8.11).



(a) Includes Medicare Agreements from 1984–85 to 1997–98.

Note: Public hospitals includes dental services, community health services, patient transport services, public health and health research undertaken by public hospitals.

Source: AIHW Health Expenditure Database.

Figure 8.7: Recurrent expenditure on public hospitals by source of funds, current prices, 1984–85 to 2005–06 (per cent)

In the estimates presented here, the subsidy and the 30% rebate have both been treated as funding by the Australian Government. This reduces the estimated share of funding by private health insurance funds, which is reflected in the drop in the overall non-government share of funding from 26% in 1996–97 to 19% in 2005–06.

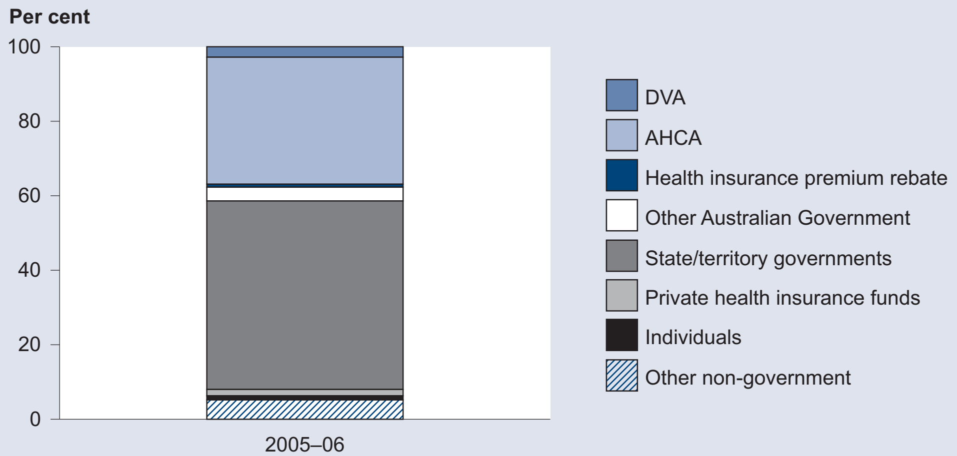
The Australian Government maintained a higher share of overall hospital funding than the state and territory governments throughout all of the 1998–99 to 2002–03 AHCA period. This was largely due to increases in private health insurance membership and therefore increases in Australian Government expenditure due to the 30% premium rebates scheme. This mostly affected the funding provided to private hospitals.

Public hospitals

Funding for public psychiatric and non-psychiatric hospitals includes funding for dental services, community health services, patient transport services, public health and health research where those activities are undertaken in public hospitals, in addition to funding for general hospital treatment provided by public hospitals.

More than 90% of funding for public hospitals comes from governments. The Australian Government's contribution—estimated at 41% in 2005–06—was largely in the form of Specific Purpose Payments (SPPs) under the AHCAs (Table 8.12). The states and territories, which have the major responsibility for operating and regulating public hospitals that operate within their jurisdictions, provided 51% of the funding for public hospitals in 2005–06.

Over the two decades since 1984–85, the relative contributions to public hospital funding by governments and non-government have varied. In 1984–85, the Australian Government and the state and territory governments funded just under 45% each and non-government sources funded the balance (11%) (Figure 8.7). This was the highest proportion of funding by the non-government sector over these two decades. Funding by the Australian Government peaked at 49% in 1993–94 and by the state and territory governments at 51% in 2005–06.



Note: Public hospitals includes dental services, community health services, patient transport services, public health and health research undertaken by public hospitals.

Source: AIHW Health Expenditure Database.

Figure 8.8: Recurrent expenditure of public hospitals by source of funds, 2005–06 (per cent)

In 1995–96, the Australian Government share of public hospital funding was 45% and the state and territory governments share was 46%. In 2005–06, the difference in the relative shares had increased, with the Australian Government providing 41% of public hospital funding and state and territory governments providing 51% (Table 8.12).

The non-government contribution was 9% in 1995–96 and 8% in 2005–06 (Figure 8.7). In 2005–06, this non-government funding consisted of funding from private health insurance (2%), individual out-of-pocket payments (1%) and other non-government funding (5%) such as workers compensation insurers and motor vehicle third-party insurers (1%), and other revenue (4%) (Figure 8.8; AIHW 2007a).

Table 8.12: Recurrent expenditure on public hospitals[(a)] by source of government funds, current prices, 1995–96 to 2005–06 (per cent)

	Australian Government						
Year	DVA	AHCA	Rebates of health insurance premiums	Other Australian Government[(b)]	Total	State/territory governments	Total government
1995–96	4.0	41.2	. .	—	45.2	45.8	91.0
1996–97	3.6	38.8	. .	0.4	42.7	48.7	91.4
1997–98	3.0	37.2	0.2	3.4	43.9	48.6	92.5
1998–99	3.5	39.5	0.4	3.0	46.4	45.9	92.4
1999–00	3.4	39.7	0.6	3.1	46.8	45.9	92.6
2000–01	3.3	39.8	0.7	3.5	47.3	44.8	92.1
2001–02	3.5	38.8	0.7	3.6	46.5	45.3	91.8
2002–03	3.7	38.2	0.7	3.4	45.9	46.9	92.8
2003–04	3.7	36.9	0.7	3.3	44.6	48.1	92.7
2004–05	3.7	35.7	0.8	3.7	43.9	48.4	92.2
2005–06	2.8	34.1	0.8	3.7	41.4	50.6	92.0

(a) Includes dental services, community health services, patient transport services, public health and health research undertaken by public hospitals.

(b) Includes DoHA direct expenditure on public hospitals, such as for blood sector payments and SPPs, excluding AHCAs, for public hospitals. These include SPPs for highly specialised drugs, hepatitis C funding, Health Program and Positron emission tomography (PET) Scanner grants.

Note: Lines separate the table according to Australian Health Care Agreement periods.

Source: AIHW Health Expenditure Database.

Public hospital services

The funding amount for the category of 'public hospital services' differs from that for 'public hospitals'. Funding for 'public hospital services' is funding for general hospital treatment provided by public hospitals; however, unlike the broader 'public hospitals' funding, it excludes funding for additional activities run by public hospitals, namely dental services, community health services, patient transport services, public health and health research. Data are available for this category for 2003–04 to 2005–06.

In 2005–06, the Australian Government provided 42% ($10,105 million) of the funding for public hospital services, a 2.7 percentage point decrease in funding from 2003–04—the majority through AHCA funding (Table 8.13). In comparison, state and territory governments contributed 51% ($12,374 million) of funding in 2005–06, an increase over 2003–04 and 2004–05.

Non-government funding of public hospital services represented 8% of total funding for public hospital services in 2005–06 ($1,840 million), also higher than in 2003–04 and 2004–05.

Table 8.13: Recurrent expenditure on public hospital services[a][b] by source of funds, current prices, 2003–04 to 2005–06

	Australian Government							
Year	DVA	AHCA	Rebates of health insurance premiums	Other Australian Govern-ment[c]	Total	State/ territory govern-ments	Non-govern-ment	Total
				Amount ($ million)				
2003–04	743	7,500	147	673	9,063	10,099	1,275	20,437
2004–05	814	7,919	180	823	9,735	10,896	1,460	22,091
2005–06	685	8,321	207	893	10,105	12,374	1,840	24,319
				Proportion (%)				
2003–04	3.6	36.7	0.7	3.3	44.3	49.4	6.2	100.0
2004–05	3.7	35.8	0.8	3.7	44.1	49.3	6.6	100.0
2005–06	2.8	34.2	0.8	3.7	41.6	50.9	7.6	100.0

(a) Public hospital services excludes dental services, community health services, patient transport services, public health and health research undertaken by the hospital. Can include services provided off the hospital site such as hospital-in-the-home dialysis or other services.

(b) Public hospital services expenditure does not include expenditure on public patients who are contracted with private hospitals as this is part of private hospital expenditure. In 2005–06, this expenditure was $244 million (Table S44).

(c) Includes DoHA direct expenditure on public hospital services, such as for blood sector payments and SPPs for public hospital services which are not AHCAs. These include SPPs for highly specialised drugs, hepatitis C funding, Health Program and PET Scanner grants.

Source: AIHW Health Expenditure Database.

Private hospitals

In 2005–06, more than two-thirds (69%) of total expenditure on private hospitals was funded by private health insurance funds ($4,598 million) (tables S44 and S53). Of this, 46% was from premiums paid by contributors and other revenues, and the remaining 23% was indirectly funded out of the 30% premium rebates paid by the Australian Government. In 2005–06, those rebates totalled $3,177 million, and $1,544 million of that was estimated to have been used in the funding of private hospitals (Table S53).

Private hospital funding also includes funding from public hospitals where they contract a private hospital to provide a service for a public patient.

Medical services

The medical services category refers to services provided by private medical practitioners operating on a fee-for-service basis. Most of these services attract benefits under Medicare and these Medicare payments are included here. Included are medical services provided to private patients in public and private hospitals. Expenditure under some Australian Government programs, such as those encouraging the supply of medical practitioners in regions where there is a shortage, is also included. Excluded are medical services provided to public patients in public and private hospitals.

Expenditure

Expenditure on medical services increased from $7,872 million in 1995–96 to $15,499 million in 2005–06, an increase in real terms of 2.6% per year (Table S45).

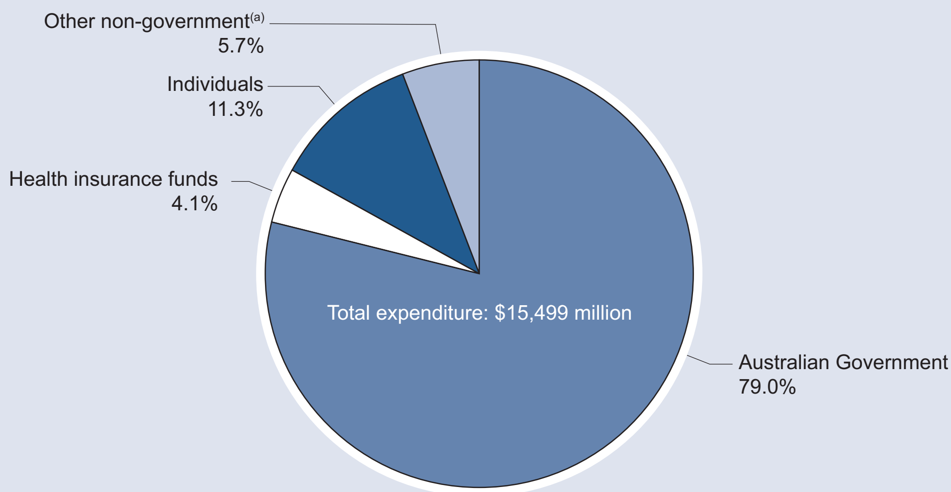
Funding

Most Australian Government funding for medical services was through Medicare benefits (Figure 8.9). The Australian Government also funded medical services for veterans and their dependants through the Department of Veterans' Affairs.

Direct funding of medical services (apart from services delivered within hospitals, as described above) by state, territory and local governments is negligible.

Most of the non-government funding for medical services (estimated at $3,261 million in 2005–06) was in the form of co-payments by individuals for services provided under Medicare (Table S44). It also includes contributions paid by health insurance funds for services to individuals provided in hospitals and payments by other non-government sources (mostly workers compensation and compulsory motor vehicle third-party insurers).

Of the $15,499 million spent on medical services in 2005–06, 79% ($12,239 million) was funded by the Australian Government. This was made up almost exclusively of medical benefits paid under Medicare, with some funding from the DVA for medical services to eligible veterans and their dependants, as well as payments to general practitioners under alternative funding arrangements. Of the remaining expenditure, 11% was funded out-of-pocket by individuals, 4% was from health insurance funds and 6% was other non-government funding.



(a) Includes funding by injury compensation insurers.

Source: AIHW Health Expenditure Database.

Figure 8.9: Recurrent expenditure on medical services by source of funds, 2005–06

In 2005–06, individuals' funding of medical services through out-of-pocket payments increased by $123 million (8%) over the previous year to reach $1,745 million (tables S43 and S44).

Between 1995–96 and 2005–06, the Australian Government's share of funding for medical services decreased from 83% to 79%, reflecting a rise in the share being met by all parts of the non-government sector (Table 8.14).

Bulk-billing influences the relative shares of funding by the Australian Government and individuals, because services that are bulk-billed do not attract any co-payment by individuals. The trends in the bulk-billing rate parallel trends in the proportion of medical services expenditure funded by individuals. So the peak for individuals' payments in 2003–04 of 12% of medical services expenditure also represented the lowest bulk-billing rate in this period (68%) (Table 8.14). Bulk-billing rates have fluctuated over the last 10 years and in 2005–06 the rate was 72%—similar to that in 1995–96 (71%).

The increase in the Australian Government proportion and the corresponding decrease in the individual proportion in 2004–05 reflect the introduction of the Strengthening Medicare program. From 1 January 2005, the program increased the Medicare benefit paid for general practitioner services from 85% to 100% of the schedule fee.

Table 8.14: Recurrent expenditure on medical services by source of funds, current prices, and proportion of medical services bulk-billed, 1995–96 to 2005–06 (per cent)

		Non-government					
Year	Australian Government	Health insurance funds	Individuals	Other	Total	Total	Bulk-billing rate
1995–96	82.5	2.8	9.6	5.0	17.5	100.0	71.1
1996–97	81.9	2.8	10.0	5.3	18.1	100.0	71.8
1997–98	81.7	2.5	10.6	5.2	18.3	100.0	71.8
1998–99	81.7	2.2	10.7	5.3	18.3	100.0	72.0
1999–00	82.1	2.2	10.3	5.3	17.9	100.0	72.3
2000–01	81.5	2.8	10.6	5.1	18.5	100.0	71.4
2001–02	80.0	3.7	10.7	5.6	20.0	100.0	70.4
2002–03	78.2	4.1	11.9	5.8	21.8	100.0	67.8
2003–04	77.2	4.3	12.4	6.1	22.8	100.0	67.5
2004–05	79.1	4.0	11.1	5.8	20.9	100.0	70.2
2005–06	79.0	4.1	11.3	5.7	21.0	100.0	71.7

Source: AIHW Health Expenditure Database.

Medications

Medications comprise:

- PBS or RPBS benefit-paid pharmaceuticals, including Section 100 payments for human growth hormones, IVF and other subsidised medications
- other medications for which no benefit was paid by PBS or RPBS:
  - private prescriptions that do not fulfil the criteria for a benefit
  - under co-payment prescriptions, which are items listed on the PBS/RPBS that are equal to or less than the cost of the statutory patient contribution (co-payment)

- over-the-counter medicines such as pharmacy-only medicines, pain-killers, cough and cold medicines, vitamins and minerals
- a range of medical non-durables such as bandages, bandaids and condoms.

Expenditure on drugs also includes drugs used in hospitals, including highly specialised drugs, for the care of admitted patients, but this is included in hospital expenditure.

Expenditure

In 2005–06, total expenditure on medications was $11,501 million, comprising $7,286 million spent on benefit-paid pharmaceuticals and $4,216 million spent on other medications; this represented 14% of recurrent health expenditure (Table S44). For the period 1995–96 to 2005–06, real growth in medications expenditure averaged 8.6% per year (Table S45). However, in 2005–06, growth in medication expenditure had slowed substantially and was only 1.6% (AIHW 2007a).

In 2005–06, expenditure on pharmaceuticals for which a prescription is required was $10,551 million, excluding the cost of vaccines purchased and administered under public health programs (Table 8.15). The majority of pharmaceutical expenditure was for benefit-paid pharmaceuticals (69% or $7,286 million)—including $232 million for Section 100 payments—and most of this was funded by the Australian Government (83%). Individuals' out-of-pocket expenses accounted for the remaining 17% of benefit-paid pharmaceuticals expenditure.

Table 8.15: Expenditure on pharmaceuticals for which a prescription is required, dispensed in the community and by hospitals[(a)], 2005–06 ($ million)

Provider and funder	Benefit-paid pharma-ceuticals	All other pharmaceuticals		Total pharma-ceuticals
		Non-hospital[(b)]	Hospital[(c)]	
Community pharmacies				
Funded by				
Australian Government DVA	468	. .	. .	468
Australian Government DoHA[(d)(e)]	5,578	71	. .	5,649
Health insurance funds	. .	47	. .	47
Individuals	1,240	1,072	. .	2,312
Injury compensation insurers and other	. .	62	. .	62
Total pharmacies	*7,286*	*1,252*	. .	*8,537*
Public hospitals[(f)]	. .	. .	1,658	1,658
Private hospitals[(g)]	. .	. .	356	356
Total	**7,286**	**1,252**	**2,014**	**10,551**

(a) Excludes complementary and alternative medicines and over-the-counter medicines for which a prescription is not required.

(b) Includes private prescriptions and under co-payment prescriptions.

(c) Does not include the costs of paying hospital staff to dispense these medications. Dispensary costs are, however, included in the first two columns of this table.

(d) Does not include $529 million in payments for highly specialised drugs, which are included in the public hospitals and private hospitals rows.

(e) Includes $232 million in Section 100 payments for human growth hormones, IVF and other subsidised medications.

(f) Includes $422 million in Australian Government payments to states for highly specialised drugs.

(g) Includes $107 million in Australian Government payments for highly specialised drugs.

Source: AIHW Health Expenditure Database.

In-hospital drugs expenditure amounted to $1,658 million spent by public hospitals and $356 million by private hospitals (Table 8.15). This expenditure included $529 million for highly specialised drugs.

Funding

The Australian Government contributed $6,046 million for pharmaceuticals under the PBS and the RPBS in 2005–06. Individuals paid $1,240 million in co-payments under these schemes and an estimated $1,072 million by way of payments for non-benefit medications (tables S44 and 8.15).

For 2005–06, government funding under the PBS (not including expenditure under the RPBS) for benefit-paid pharmaceuticals was estimated at $5,384 million, an increase of $88 million from 2004–05 (Table 8.16). The shares of funding for the PBS provided by the Australian Government through benefits and by individuals through their co-payments changed little until 1 January 2005, when the co-payment increased from $23.70 per prescription to $28.60 for general patients and from $3.80 to $4.60 for concessional patients. From 1 January 2008, the general patient co-payment is $31.30 and the concessional patient co-payment is $5.00 (DoHA 2007).

Table 8.16: Funding of Pharmaceutical Benefits Scheme[(a)] subsidised medications, 2001–02 to 2005–06 ($ million)

Benefit category	2001–02	2002–03	2003–04	2004–05	2005–06
Patient contributions					
General patients	444	489	545	597	634
Concessional patients	362	370	393	444	489
Total patient contributions	*806*	*860*	*938*	*1,041*	*1,123*
Government benefits					
General patients—no safety net	691	751	824	851	850
General patients—safety net	148	170	191	223	216
Total general patients	*840*	*920*	*1,015*	*1,073*	*1,066*
Concessional patients—no safety net	2,570	2,747	2,972	3,077	3,145
Concessional patients—safety net	778	908	1,005	1,145	1,173
Total concessional patients	*3,348*	*3,655*	*3,977*	*4,223*	*4,318*
Total funding by government	*4,188*	*4,575*	*4,992*	*5,296*	*5,384*
Total cost of PBS benefit-paid items[(b)]	**4,994**	**5,435**	**5,929**	**6,337**	**6,508**

(a) Does not include Repatriation Pharmaceutical Benefits Scheme or 'doctor's bag' pharmaceuticals.

(b) Excludes Section 100 payments for human growth hormones, IVF and other non-PBS subsidised medications.

Note: Components may not add to totals, because of rounding.

Source: DoHA unpublished data.

Dental services

Expenditure

In 2005–06, expenditure on dental services was $5,337 million, representing 6.6% of total recurrent expenditure on health (Table S44). For the period 2003–04 to 2005–06, real growth in dental services expenditure averaged 1.9% per year—comprising 2.4% for state and territory dental services and 1.8% for private providers. This was half the annual real growth in total recurrent health expenditure of 3.8% (Table S45).

Funding

Just over two-thirds ($3,573 million) of dental services expenditure was funded by individual out-of-pocket payments, 18.6% by governments and 14.2% by health insurance funds (Table S44).

Public health activities

Expenditure

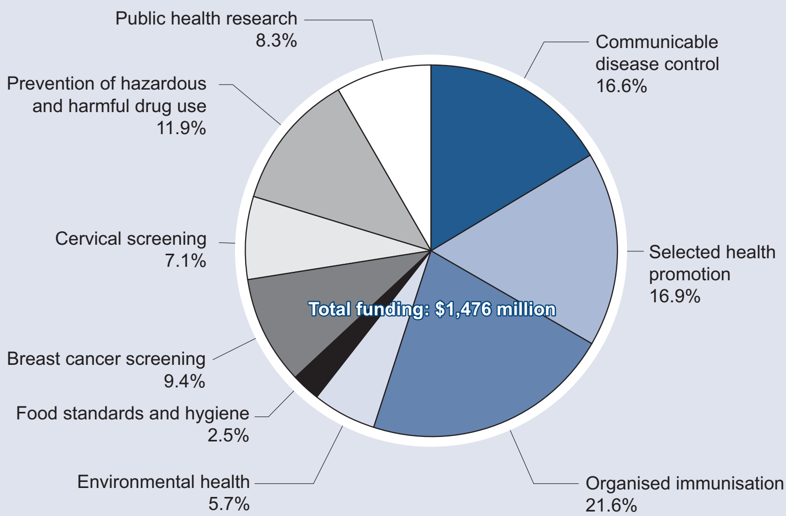
Public health activities are those that focus on the whole population or on population subgroups, such as those who are targets of cancer screening or immunisation programs. This distinguishes them from treatment services for disease or injury, such as those provided to patients in hospitals. Some information on these public health interventions is available in Chapter 7.

Estimates of expenditure on public health activities are presented in a series of publications from the National Public Health Expenditure Project, an initiative of the National Public Health Partnership. The latest is for 2005–06.

For the latest three years of data, public health expenditure was $1,263 million in 2003–04, $1,440 million in 2004–05, and $1,476 million in 2005–06.

In 2005–06, governments in Australia, through programs administered by their health departments, spent a total of $1,476 million on public health activities (Table S48; Figure 8.10); this represented 1.8% of total recurrent expenditure on health (Table S44). Real growth in expenditure on public health averaged 4.0% per year from 2003–04 to 2005–06 (Table S45).

Expenditure on organised immunisation accounted for $318 million (22% of all government expenditure on public health activities) during 2005–06 and was the largest single area of such expenditure (Table S48; Figure 8.10). Selected health promotion activities accounted for a further $250 million (17%) and communicable disease control activities cost $245 million (17%). Activities directed at preventing hazardous and harmful drug use accounted for $176 million (12%).



Source: AIHW Health Expenditure Database.

Figure 8.10: Government expenditure on public health activities, 2005–06

Funding

Funding of public health activities is split between the Australian Government ($798 million or 54% of public health expenditure in 2005–06) and state and territory governments ($632 million or 43%), plus a small contribution from individuals ($47 million or 3%) through out-of-pocket payments (Table S44). A substantial proportion of the Australian Government public health funding is through public health grants to the states and territories ($357 million or 24% of public health expenditure) (AIHW 2007a).

Capital expenditure

There are multiple sources of funding for health infrastructure. For example, the Australian Government funds capital expenditure through grants and subsidies to other levels of government and to non-government organisations. State and territory governments control large capital assets such as hospitals and community health centres.

Total capital expenditure in 2005–06 was estimated to be $5,167 million—6% of total health expenditure (Table S44). Over half of this (60%) was funded by non-government sources. State/territory and local governments funded 37% of total capital expenditure and the Australian Government funded 4% (Table 8.17). Estimates of capital expenditure are sourced from the Australian Bureau of Statistics and they have been revised for most of the earlier years. Therefore, comparisons should not be made with data provided in previous *Australia's health* reports.

The long-term nature and 'lumpiness' of capital investments means that trend analysis, even over a period as long as a decade, needs to be done with care.

Table 8.17: Capital health expenditure by source of funds, 1995–96 to 2005–06 (per cent)

	Government				
Year	Australian Government	State/territory and local	Total	Non-government	Total
1995–96	4.4	49.6	54.0	46.0	100
1996–97	2.7	52.1	54.8	45.2	100
1997–98	2.6	57.0	59.7	40.3	100
1998–99	5.7	38.6	44.4	55.6	100
1999–00	1.2	45.4	46.6	53.4	100
2000–01	3.7	41.4	45.1	54.9	100
2001–02	4.3	38.9	43.2	56.8	100
2002–03	3.5	36.5	40.1	59.9	100
2003–04	3.6	33.0	36.7	63.3	100
2004–05	4.1	33.7	37.8	62.2	100
2005–06	3.5	36.7	40.3	59.7	100

Note: Components may not add to totals, because of rounding.

Source: AIHW Health Expenditure Database.

What is the role of private insurance in health funding?

All Australians are entitled to receive treatment as public patients in public hospitals at no direct personal cost. As an alternative, private health insurance funds provide cover for their members who choose to be treated as private patients in either public or private hospitals. They may also provide a range of non-hospital benefits to insured people (Box 8.5). The health benefits paid out by private insurers finance part of the health expenditure incurred by their members.

Since the introduction of private health insurance subsidies in 1997 (Box 8.5), the funding for members' health benefits now comes from a combination of:

- the net premiums paid by members of the funds
- the rebates on premiums paid by the Australian Government under the incentive arrangements.

Private health insurance funds pay benefits for a wide range of health services and, in the information that follows, it has been assumed that the funding that comes from net premiums and government rebates are used in the same proportions.

Box 8.5: Private health insurance arrangements

Since 1984, private health insurance funds in Australia have offered insurance cover for various services provided in public and private hospitals. They also offer cover for a range of non-hospital health and health-related services such as dentistry, physiotherapy, podiatry, pharmaceuticals and spectacles.

The Private Health Insurance Incentives Act 1997 introduced a means-tested subsidy, the Private Health Insurance Incentives Scheme, aimed at assisting low- to middle-income earners to obtain private health insurance cover. This was replaced in January 1999 by a 30% premium rebate payable to anyone with private health insurance cover. From April 2005, the rebate for people aged 65–69 years increased to 35% of the premium, and for people aged 70 years and over it increased to 40% of the premium. Changes to the private health insurance legislation, which took effect on 1 April 2007, allowed health insurers to expand hospital policies to cover medical treatments outside hospital, which substitute for or prevent hospitalisation. They are also able to cover programs to manage chronic diseases.

For private health insurance fund members, health insurance arrangements changed substantially on 1 July 2000, with the introduction of 'Lifetime Health Cover' incentives. These encourage people to continue private health insurance cover throughout their lives. From that date, people who join a health insurance fund before the July following their thirtieth birthday and maintain their hospital cover pay lower premiums throughout their lives than those who join later in life. People aged over 30 years who take out hospital cover pay a loading of 2% for each year their entry age is over 30. Fund members who had hospital cover at 1 July 2000 and maintain it are exempt from the loading. People who were aged 65 years or over at 1 July 1999 are also exempt from premium loading. Changes to 'Lifetime Health Cover' were announced in 2006 and were being implemented progressively from 2007. Under the new legislation, people who keep their health insurance for 10 continuous years, and remain members, will stop paying a loading.

Who funds private health insurance?

In 2005–06, the amount of funding for health services through private health insurance funds (that is, total benefits paid from members' net premiums plus the Australian Government rebate) was $9,461 million (Table S53). This was 12% of recurrent expenditure on health in that year. Of that, $3,177 million (34%) was funded from the rebates on private health insurance premiums provided by the Australian Government (tables S44 and S53). The net funding of health services (including health insurance fund administration costs) by the funds themselves (that is, excluding the premium rebate) increased from $6,038 million in 2004–05 to $6,284 million in 2005–06 (Table S53).

Box 8.6: Treatment of rebates on private health insurance premiums in the expenditure estimates

Before 1997, all health benefits paid by the funds, plus their administration costs, were regarded as health funding by the funds. The introduction of the Private Health Insurance Incentives Scheme (see Box 8.5) and its replacement non-means-tested 30% rebate meant that some of the money the funds use to pay for health benefits and administration now comes from the Australian Government.

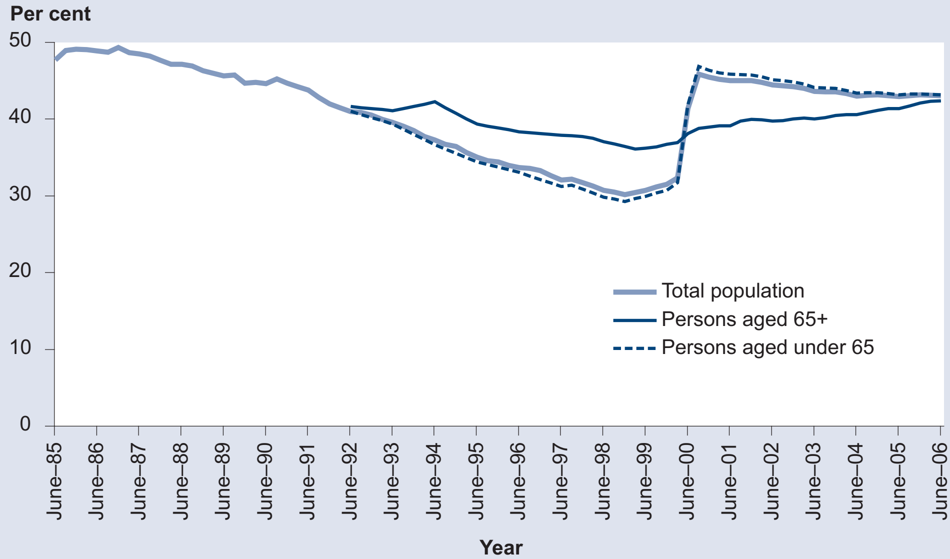
In compiling its estimates, the AIHW allocates the premium rebates paid by the Australian Government across all the expenses incurred by the funds each year—these include benefit payments related to health goods and services; benefit payments for non-health goods and services (such as funeral benefits, domestic assistance and so on); management expenses; and adjustment to provisions for outstanding and future potential claims. But only that part of the rebate that can be attributed to benefits for health goods and services and to management expenses is reported as part of total health expenditure (see further information in Table S53). This amount is deducted from the gross benefits and management expenses paid by the health insurance funds in the calculation of health funding by private health insurance.

What health areas are funded?

Funding by private health insurance funds is chiefly directed towards private hospital services. During 2005–06, private hospitals received $3,054 million (49%) of the $6,284 million in funding provided by health insurance funds (Table S53). Other major health areas that received funding were dental services ($760 million or 12%), administration ($639 million or 10%) and medical services ($636 million or 10%). The funding for medical services includes some of the cost of in-hospital medical services which are provided to private admitted patients in hospitals.

Trends in coverage, membership and premiums

At the end of June 2006, 43.5% of the Australian population was covered by private hospital insurance (PHIAC 2006). This was similar to the coverage in the June 2005 quarter (42.8%) but was a fall from a peak of 45.7% at the end of the September 2000 quarter after the introduction of the lifetime cover arrangements in July 2000 (Figure 8.11; Box 8.5).



Sources: OECD 2007; PHIAC 2001 to 2006; PHIAC unpublished data.

Figure 8.11: Proportion of Australia's population covered by basic private health insurance, 1985–2006

How much is health care likely to cost in the future?

In this section, health expenditure includes residential aged care (high-care) expenditure. A recent study based on 2002–03 data (Vos et al. 2008) estimated that total health expenditure will increase by 127% over the three decades between 2002–03 and 2032–33, from $71 billion to $162 billion (in constant prices)—an increase of $91 billion (Table 8.19). Over the same period GDP is predicted to increase by 97% (Treasury 2002), so total health expenditure is projected to increase from 9.4% of GDP to 10.8%.

In this study, health-care costs were projected taking into consideration past trends in population growth, ageing, disease rates and shifts in health expenditure combined with judgements on how these trends are likely to apply over the projection period. Estimates were made for each disease, in each age and sex grouping, for each health service type and for treatment versus prevention. These estimates should be interpreted with caution as developments in health technologies and health service use and advances in prevention and treatment may drastically alter the projected outlook for some diseases.

Residential aged care expenditure was expected to show the greatest growth (242% increase) over the three decades, mainly because of the ageing of the population in this period. Pharmaceutical expenditure has the next highest projected growth (145%). Medical services expenditure growth is expected to be somewhat lower (97%) (Table 8.18).

Table 8.18: Change in health and residential aged care expenditure for each area of expenditure, 2002–03 to 2032–33 (per cent)

	2002–03 to 2012–13	2012–13 to 2022–23	2022–23 to 2032–33	2002–03 to 2032–33
Admitted patient services	26	34	31	121
Medical services	26	27	23	97
Pharmaceutical prescriptions	37	37	31	145
Residential aged care (high-care)	43	49	60	242
Other health	22	27	27	97
Total	**28**	**33**	**33**	**127**

Source: Vos et al. 2008.

Diabetes has by far the greatest projected expenditure increase of the diseases (401%) followed by neurological disorders (280%), musculoskeletal conditions (164%) and dental services (144%) (Table 8.19).

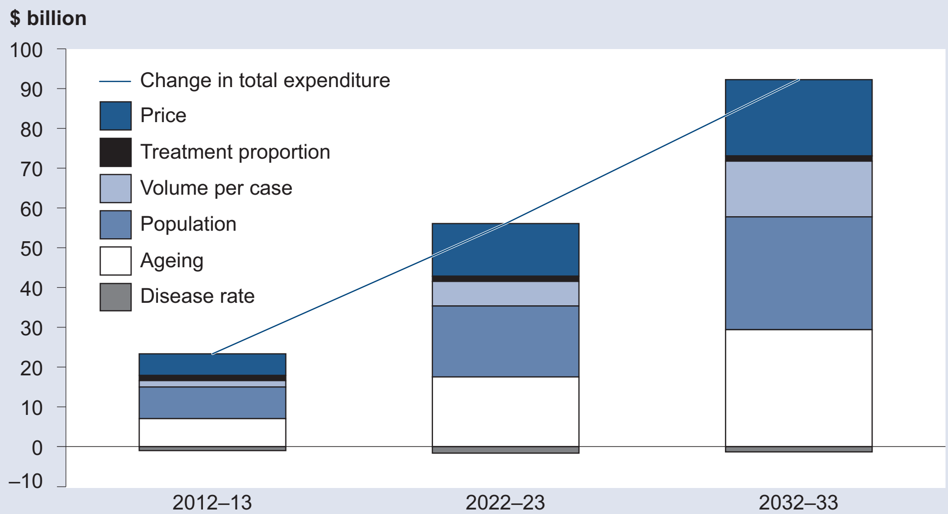
Expenditure on cardiovascular disease can be divided into treatment costs and prevention costs. Expenditure on the treatment of cardiovascular disease is projected to increase by 111%. There is also an expected 96% increase in expenditure on preventing cardiovascular disease through blood pressure lowering drugs and cholesterol lowering drugs. This contributes to an overall increase in cardiovascular expenditure of 105% ($7.9 billion to $16.2 billion).

By comparison, the projected increases in expenditure for injuries (67%) and maternal and neonatal conditions (41% and 42%) are low.

The largest absolute increases in projected expenditure between 2002–03 and 2032–33 were for neurological disorders ($11.2 billion) followed by cardiovascular disease ($8.3 billion) (Table 8.19).

From the study, the projected change in health expenditure in Australia between 2002–03 and 2032–33 of $91 billion would have been higher by $1.3 billion if disease trends were ignored (Vos et al. 2008). Predicted favourable trends in the disease rates of cardiovascular disease, chronic obstructive pulmonary disease (COPD), cancers, injuries and other diseases over the period led to a predicted decrease in expenditure of $5.0 billion. However, this was countered by the steep increase in projected cases of diabetes and an increase for other diseases, giving a net treatment expenditure increase of $3.7 billion.

Ageing ($29 billion) and normal (overall) population growth ($28 billion) were the main causes for the overall increase projected for the period. Excess health price inflation (the amount by which increases in the cost of health exceed the increases in cost of the economy as a whole) ($19 billion), changes in volume of health services provided per case ($14 billion) and, to a lesser extent, treatment proportion ($1.3 billion) also contributed to the projected increase in expenditure (Figure 8.12).



Source: Vos et al. in press.

Figure 8.12: Components of projected change in health expenditure

Table 8.19: Projected health expenditure[(a)] (2002–03 dollars), 2002–03 to 2032–33

	Expenditure (billions of 2002–03 dollars)				Per cent change 2002–03 to 2032–33
Disease category	**2002–03**	**2012–13**	**2022–23**	**2032–33**	
Cardiovascular	7.91	10.28	13.00	16.18	105
Respiratory	5.92	7.35	9.66	12.62	113
COPD	*0.60*	*0.65*	*0.73*	*0.81*	*35*
Other respiratory	*5.32*	*6.70*	*8.93*	*11.81*	*122*
Injuries	5.59	6.48	7.68	9.36	67
Dental	5.10	6.61	9.11	12.43	144
Mental	4.30	5.30	6.69	8.48	97
Digestive	4.04	5.32	7.22	9.66	139
Neurological	3.98	5.91	9.08	15.13	280
Dementia & Parkinson's	*3.53*	*5.30*	*8.22*	*13.91*	*294*
Other neurological	*0.45*	*0.61*	*0.86*	*1.21*	*168*
Musculoskeletal	3.74	5.13	7.28	9.86	164
Genitourinary	3.06	3.86	5.10	6.80	122
Cancer	2.81	3.54	4.50	5.17	84
Sense disorders	2.29	3.06	4.30	5.13	124
Endocrine, nutritional & metabolic	2.17	2.63	3.33	4.14	91
Skin	1.96	2.52	3.35	4.45	127
Maternal	1.78	1.88	2.23	2.51	41
Infectious	1.55	1.82	2.22	2.70	75
Diabetes	1.39	2.43	4.21	6.97	401
Neonatal	0.52	0.56	0.66	0.74	42
Congenital	0.26	0.28	0.34	0.40	55

(continued)

Table 8.19 (continued): Projected health expenditure[(a)] (2002–03 dollars), 2002–03 to 2032–33

Disease category	Expenditure (billions of 2002–03 dollars)				Per cent change 2002–03 to 2032–33
	2002–03	2012–13	2022–23	2032–33	
Other	13.01	16.70	22.27	29.58	127
Total ($)[(b)]	**71.38**	**91.66**	**122.23**	**162.32**	**127**
GDP[(c)] ($)[(b)]	**762**	**995**	**1,230**	**1,500**	
Total as per cent of GDP	**9.37%**	**9.22%**	**9.93%**	**10.82%**	

(a) Projected health expenditure includes expenditure on services provided in high-level residential aged care facilities.

(b) All numbers including 2002–03 are projected from the 2000–01 base level. Actual total health expenditure in 2002–03 was $73.1 billion based on figures reported in *Health expenditure Australia 2003–04* and actual GDP was $783 billion.

(c) Calculated from first Intergenerational Report (Treasury 2002: iii).

Source: Vos et al. in press.

8.2 Health workforce

Access to health care and advice is regarded as essential to quality of life, so the size, distribution and effectiveness of the health workforce is the subject of much scrutiny by governments, the media and the community. There is great interest—not only among those currently providing health care, but also in the populations they serve—in real and potential changes in the size and composition of the health workforce. For example, there have been numerous reports in the news media about shortages of doctors and nurses, particularly for rural areas. These pressures have led to a number of recent government initiatives in relation to the health workforce (see Box 8.7 for examples).

Box 8.7: Council of Australian Governments agreements to changes in the health workforce

A recent Productivity Commission review of the Australian health workforce found workforce shortages across a number of health professions, with these shortages being more acute in rural and remote areas and in certain special needs sectors. It also found that the demand for health workforce services will increase with population ageing, growing community expectations and developing technology, while at the same time the health labour market will become more constricted. The Commission made a number of recommendations aimed at training more health workers, increasing the retention and re-entry to the workforce of qualified health workers, and improving the efficiency, effectiveness and distribution of the available workforce (Productivity Commission 2005).

In response to this report, the Council of Australian Governments agreed to a package of reforms to help the health workforce respond to the evolving care needs of the Australian community, while maintaining the quality and safety of health services. Key components of this package are intended to:

- reduce health workforce shortages through significant investments, including additional medical school and higher education nursing places and capital funding for medical schools and nurses' clinical training. The increase in medical school places would result in an expansion in the number of medical school places bonded to areas of workforce shortage
- promote workforce mobility and consistency between jurisdictions by creating national registration and accreditation schemes for health professions

(continued)

- provide greater health service access for rural, remote and Indigenous communities by introducing a new Medicare item for practice nurses and registered Aboriginal health workers to provide ongoing support for patients with chronic disease
- help medical specialist trainees build appropriate skills and experience by providing a new system of training rotations through an expanded range of settings beyond traditional public teaching hospitals, including regional, rural and ambulatory settings, private sector hospitals and practices and community settings
- create a national health workforce taskforce to undertake workforce projects and advise governments on workforce innovations and reforms.

Source: COAG 2006.

This section provides the most recent data on the numbers, demographic characteristics, activity and distribution of health workers. This information is necessary for developing and evaluating policies and programs for the health workforce. Information on the proportion of females in the workforce is provided because females, on average, are more likely to work fewer hours per week than their male counterparts. In addition, the proportion of the workforce aged 55 years and over provides an indication of those likely to retire in the short to medium term.

Data on the health workforce are collected by the Australian Bureau of Statistics through the 5-yearly national population Censuses and monthly labour force surveys, and by the AIHW through surveys of those registering as health professionals. These sources are described in Box 8.8.

The health workforce, as presented in this section, refers to people employed to provide health care. It does not include volunteers, individuals taking action to improve their own health, or people who work in other areas relating to the wellbeing of the population.

Box 8.8: Sources of data on the health workforce

There are three main sources of ongoing data on the health workforce:

- The Australian Bureau of Statistics (ABS) Census of Population and Housing, conducted every 5 years, collects information from all persons aged 15 years and over about their employment status, occupation and industry. Because of the timing of this publication, and the level of detail required, it was not possible to use the latest Census of Population and Housing data as the primary source of information on health workers.
- The ABS Labour Force Survey is a monthly sample survey that includes about 30,000 private dwellings. Households selected for the survey are interviewed each month for 8 months, with one-eighth of the sample being replaced each month. Some data from this survey are reported monthly (such as the unemployment rate), and more detailed information is reported quarterly (industry and occupation). Data from this source are referenced in this issue of *Australia's health* as they provide information on the number of people employed by industry and occupation, as well as the total hours worked (from which workload measures, such as full-time equivalents, can be calculated).

(continued)

- The AIHW compiles the surveys of medical, nursing, dental and allied health workers conducted by the states and territories, usually in conjunction with the registration of health professionals. These are completed yearly for nursing, medicine and dentistry, and less regularly for other professions.

Each of these data sources has its strengths and weaknesses. The Census of Population and Housing, because it includes the whole population, allows the analysis of labour force information for small population groups (for example, the smaller states and territories and the Indigenous population), but only every 5 years. The ABS Labour Force Survey allows annual reporting of the size and distribution of the health workforce but, because it is based on a sample population, has limited capacity to provide detailed information about smaller population groups, particularly smaller groups of allied health professions, or those from small areas. One advantage of the Labour Force Survey is that it collects more detailed information on hours of work than the Census of Population and Housing. It is also available more regularly than the Census data. Occupation in both the Census and the Labour Force Survey is self-identified.

The AIHW health labour force surveys provide more detailed data on a more limited number of health occupations than the ABS collections. The surveys are usually of all people registered with the relevant registration boards for that profession, regardless of employment status. Information is collected on demographic characteristics, labour force status, type of work and location, specialty fields and qualifications of health professionals. However, the AIHW surveys are not compulsory and response rates vary between occupations, states/territories and over time. The most recent information on the medical, nursing and dental workforces, as reported in this edition of *Australia's health*, is from the 2005 AIHW surveys. For the allied health professions, the latest data available are from surveys conducted in 2002 and 2003. Unlike the ABS Census and Labour Force Surveys, the AIHW survey data are not reported using the Australian Standard Classification of Occupation categories.

Health occupations and industries

The number of people employed in health occupations and whether they work in the 'health services' industry is shown in Figure 8.13. Health occupations, as specified in the Australian Standard Classification of Occupations, include medical, dental and nursing workers, medical imaging workers, pharmacists, allied health workers, complementary therapists and other health workers (ABS 1997). For the purposes of this publication, social workers have been added to this group of health occupations.

The health services industry includes those organisations that are mainly engaged in providing health services, such as hospitals, nursing homes, ambulance services, community health services, medical and dental services, and other health services such as pathology, optometry, physiotherapy and chiropractic services (ABS 2006).

The health services industry contained 7% of the civilian labour force in 2006 (Table 8.20). The number of people employed in the health industry has grown considerably since 1986, from 483,900 in August 1986 to 743,800 in August 2006. In the 5 years from 2001 to 2006, growth in health industry employment was 14%, compared with a 10% growth in the civilian labour force over the same period.

Most workers in the health services industry (63%) in 2006 were employed in health occupations; that is, occupations including doctors, nurses, dentists, pharmacists and so forth (Figure 8.13). The remaining workers held other occupations ranging from clerical workers to cooks, gardeners, cleaners and transport drivers.

	Health services industry[a]	Other industries	Total
Health occupations	477,800 employed persons e.g. doctors, nurses, dentists, allied health workers, ambulance officers, social workers.	115,500 persons employed in health services occupations in other industries e.g. retail pharmacists.	**593,300**
Other occupations	276,000 persons employed in other occupations in health services industries e.g. clerical workers, service workers, welfare professionals.		
Total	**753,800**		

(a) Excludes veterinary services.

Note: Numbers are derived for 2006 by averaging the number employed in the four quarters of that year.

Source: Unpublished data from ABS Labour Force Surveys, 2006.

Figure 8.13: The relationship of health occupations to the health and other industries, 2006

Table 8.20: Persons employed[a] in the health services industry[b], August quarter 1986 to August quarter 2006

Year	Employed in health services industry[a,b]	All employed persons ('000)	Proportion of all employed persons (%)	Civilian labour force ('000)[c]	Proportion of civilian labour force[c] (%)
1986	483,900	6,928,900	7.0	7,512,100	6.4
1991	569,100	7,650,300	7.4	8,424,100	6.8
1996	579,100	8,332,800	6.9	9,070,300	6.4
2001	655,000	9,040,000	7.2	9,683,000	6.8
2006[d]	743,800	10,168,000	7.3	10,647,600	7.0
2001 to 2006 increase (%)	**13.6**	**12.5**	. .	**10.0**	. .

(a) Because of a definitional change in 'employed' and 'unemployed' persons, there is a break in the series for data at the detailed industry level after 1996. Some care should therefore be taken in comparing numbers of employed people within the health industry over time.

(b) Excludes persons employed in veterinary services.

(c) Includes unemployed persons looking for work. Civilian labour force excludes members of the permanent defence forces, certain diplomatic personnel of overseas governments customarily excluded from census and estimated population counts, overseas residents in Australia, and members of non-Australian defence forces (and their dependants) stationed in Australia.

(d) Numbers in this table are for August quarter 2006, whereas estimates in Figure 8.13 are based on an average of all quarters in 2006.

Source: Unpublished data from ABS Labour Force Survey, 1986, 1991, 1996, 2001 and 2006.

In 2006, there were 593,300 people working in health occupations, of whom four in five (477,800) were working in a health industry (Figure 8.13). Those working outside health industries were employed in a variety of other industries, typically community services, government administration, education and defence.

Between 2001 and 2006, the number of workers in these occupations increased by 23%, from 482,700 to 593,300. This was almost double the increase of 12% across all occupations over the same period (Table 8.21). Growth over this period was highest for medical administrators and nursing directors (69% growth), nursing and personal care assistants (55%) and dental practitioners (41%). The two groups with the lowest growth rates were generalist medical practitioners (8%) and professional nursing workers (12%).

People working in health occupations are mainly female. In 2006, 73% of the health workforce was female compared with 45% across all occupations (Table 8.21). The health occupations with the highest proportion of females in 2006 were professional nursing workers and enrolled nurses (both 90%), dental associate professionals and assistants (86%), social workers (81%), other allied health workers and nursing and personal care assistants (both 80%).

Table 8.21: Persons employed in health occupations: number, per cent female and per cent aged 55 years and over, 2001 and 2006

	2001			2006			
Occupation	Number	Per cent female	Per cent aged 55 years and over	Number	Per cent female	Per cent aged 55 years and over	Per cent increase in numbers, 2001–2006
Medical administrators, nursing directors	5,800	63	*12	9,800	73	27	69
Generalist medical practitioners	36,200	34	21	39,000	38	21	8
Specialist medical practitioners	17,200	24	22	20,500	31	26	19
Medical imaging workers	8,200	66	*9	11,000	68	*15	34
Dental practitioners	9,000	20	*12	12,700	25	22	41
Dental associate professionals and assistants	19,200	90	**	23,900	86	*9	24
Nursing worker: professionals	182,000	90	11	203,500	90	17	12
Enrolled nurses	23,200	95	*8	30,000	90	15	29
Nursing and personal care assistants	41,600	71	11	64,600	80	18	55
Pharmacists	12,600	57	*20	16,300	52	17	29
Physiotherapists	11,500	78	*18	13,100	64	*12	14
Psychologists	11,100	72	*13	13,900	72	23	25
Other allied health workers[(a)]	23,300	76	*11	26,600	80	*10	14

(continued)

Table 8.21 (continued): Persons employed in health occupations: number, per cent female and per cent aged 55 years and over, 2001 and 2006

Occupation	2001 Number	2001 Per cent female	2001 Per cent aged 55 years and over	2006 Number	2006 Per cent female	2006 Per cent aged 55 years and over	Per cent increase in numbers, 2001–2006
Complementary therapists	7,400	50	*14	8,900	53	*11	20
Social workers	10,200	86	*9	13,600	81	*18	33
Other health workers(b)	64,500	50	8	86,200	56	12	34
All health workers	482,700	72	12	593,300	73	16	23
All other occupations	8,576,500	43	11	9,557,000	43	**14**	11
Total all occupations	**9,059,200**	**44**	**11**	**10,150,300**	**45**	**14**	**12**

* Estimates have a relative standard error between 25% and 50% and should be interpreted with caution.

** Estimates have a relative standard error greater than 50% and are considered too unreliable for general use.

(a) Includes occupational therapists, optometrists, speech pathologists, podiatrists, dietitians and other health professionals.

(b) Includes medical scientists, occupational and environmental health professionals, medical technical officers, ambulance officers and paramedics, Aboriginal and Torres Strait Islander health workers, massage therapists, primary products inspectors and safety inspectors.

Source: Unpublished data from ABS Labour Force Surveys, 2001 and 2006.

Workforce supply—the stocks and flows

A key issue is the adequacy of supply of health workers. Monitoring and adjusting the supply of health workers to meet the projected needs of the population requires that:

- the current size, composition and working hours of the existing health workforce is measured
- the entries to and exits from the workforce are measurable, and with lead and lag times understood.

New entrants to the workforce are mainly from the education system and skilled immigration. Departures from the workforce include migration, resignations, retirements and deaths.

Not all these elements of workforce supply can be accurately measured. For example, current health workforce migration data are not considered to be of sufficient quality to provide a reasonable measure of this component.

Three aspects of supply are presented here in further detail: the number of students completing higher education health courses, the number of health workers assumed to be soon to retire from the workforce, and the hours worked by health workers.

How many people are completing health courses?

For the health professions (such as registered nurses, medical practitioners, dentists, pharmacists, radiographers, occupational therapists and so on), graduation from a relevant university course is a requirement. Accordingly, an important source of entrants into these occupations is Australian residents completing health-related higher education courses each year.

Between 2001 and 2005, there was an overall increase of 16% in those completing such courses (Table 8.22). Increases were recorded for each health field except podiatry and optical science. The largest growth occurred in the fields of nutrition and dietetics (81%) and pharmacy (48%). The smallest increases were for medical studies (4%) and nursing (7%). Note that enrolled nurses, unlike registered nurses, undertake their initial education through the Vocational Education and Training (VET) system and are not included in these figures.

The National Health Performance Committee has developed an indicator of sustainability for three professions—pharmacy, medicine and registered nursing: 'Graduates as a percentage of the total pharmacy, medical and nursing workforce' (NHPC 2004). The 'sustainability ratio' can be calculated using course completions as a percentage of people employed in those professions in the following year, based on AIHW labour force survey data.

Table 8.22: Completions of selected health-related higher education courses[a] by Australian citizens and permanent residents (excluding New Zealand citizens), per cent female and field of study, 2001 and 2005

	2001			2005			Per cent change in number, 2001 to 2005
Field	Number	Per cent female	Per cent under-graduate[b]	Number	Per cent female	Per cent under-graduate[b]	
Medical studies	2,085	52.3	66.8	2,158	56.8	62.8	3.5
Nursing	8,217	89.6	69.8	8,794	89.4	67.4	7.0
Pharmacy	683	63.3	88.1	1,009	66.1	85.0	47.7
Dental studies[c]	339	54.9	81.1	383	58.5	80.2	13.0
Optical science[d]	172	59.9	58.1	156	59.6	55.1	–9.3
Public health[e]	1,686	68.7	34.8	2,038	68.9	32.5	20.9
Radiography	571	69.7	67.1	814	66.5	77.0	42.6
Physiotherapy	784	60.1	80.9	896	67.2	72.4	14.3
Occupational therapy	665	90.2	88.4	833	91.4	83.2	25.3
Speech pathology/ audiology	401	94.0	80.5	529	93.8	73.3	31.9
Podiatry	145	57.9	93.8	138	64.5	94.2	–4.8
Other rehabilitation therapies[f]	646	61.5	50.0	839	68.8	52.4	29.9
Complementary therapies[g]	353	65.7	76.8	383	74.2	77.3	8.5
Nutrition and dietetics	248	89.5	51.2	448	90.6	68.1	80.6
Other health[h]	2,009	53.0	83.0	2,617	58.2	78.7	30.3
Total	**19,004**	**74.6**	**69.2**	**22,035**	**76.0**	**67.1**	**15.9**

(a) Health-related courses are defined as those in the broad field of Health excluding veterinary studies, in the Field of Education Classification.

(b) Bachelors (graduate entry, honours, pass), associate degree, advanced diploma, diploma, other undergraduate award.

(c) Includes dental studies, dentistry, dental assisting and dental technology.

(d) Includes optical science, optometry and optical technology.

(e) Includes public health, occupational health and safety, environmental health, Indigenous health, health promotion, community health, epidemiology.

(f) Includes chiropractic and osteopathy, massage therapy, rehabilitation therapies.

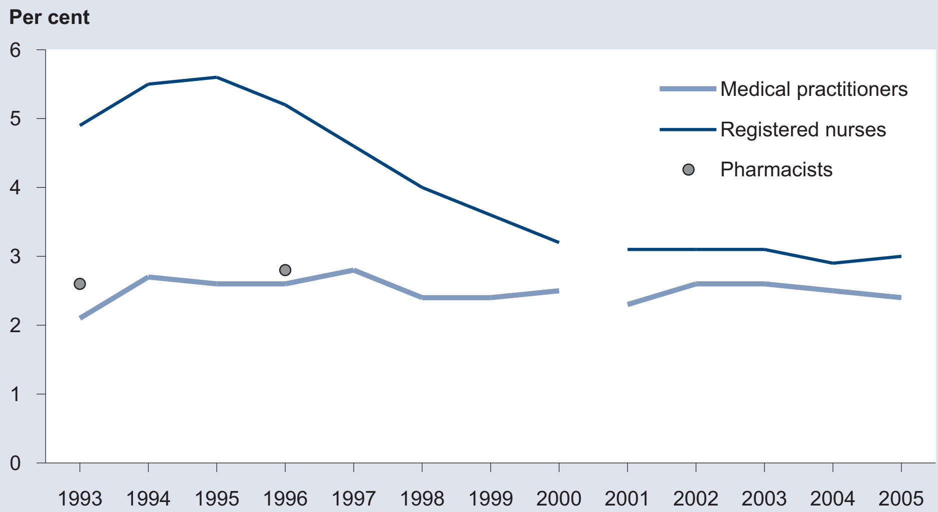
(g) Includes complementary therapies, naturopathy, acupuncture, traditional Chinese medicine.

(h) Includes human movement, paramedical studies, first aid, other health.

Source: Unpublished data from Higher Education Student Statistics collection, DEST.

Between 2001 and 2005 the 'sustainability ratio' was 3% for employed registered nurses (*NHPC indicator 3.25*, Figure 8.14). During 1994 and 1995, it was above 5%, a high point as many registered nurses took the opportunity to upgrade their hospital-based training to academic qualifications (National Review of Nursing Education 2002). The subsequent decline can be accounted for by fewer nurses upgrading their qualifications. The sustainability ratio for medical practitioners has remained consistently between 2% and 3%.

The ratio for pharmacists was available only for 2 years, 1993 and 1996. For these years it was between 2% and 3%. Course completion information from the Department of Education, Science and Training shows that the number of completions of undergraduate pharmacy courses by domestic students increased from 602 in 2001 to 858 in 2005.



Notes

1. The points in the figure are calculated as the number of Australian citizens and permanent residents (excluding New Zealand citizens) who completed undergraduate degrees at an Australian university in medicine, nursing or pharmacy by the estimated number of employed medical practitioners, registered nurses and pharmacists (respectively) in the following year (multiplied by 100).
2. Care should be taken when interpreting the relationship between completions and employed workforce numbers because the relationship is not always a direct one. That is, not all those who complete an undergraduate course in a particular field will go on to become employed in that field. Some nurses will have already been employed as registered nurses before completing a university course, as training moved from hospitals to universities.
3. Completions refer to undergraduate courses in the relevant field of study (before 2001) and field of education (from 2001 onwards). There is a break in the series due to this change in education classification.
4. Registered nurses only are included, as enrolled nurse training is undertaken in the VET sector, not at university.
5. Data on the number of employed registered nurses were not available for 1996, 1998, 2000 and 2001. Trend estimates have been used to fill in gap years.
6. Only two points are given for pharmacists, 1993 and 1996. While estimates of the number of employed pharmacists are also available for 1999, completion data for 1998 (and 1997) cannot be used because of a shift from 3- to 4-year training courses at that time.

Sources: DEST Higher Education Student Data Collection; AIHW Medical, Nursing and Midwifery and Pharmacy Surveys.

Figure 8.14: Australian citizens and permanent residents who completed selected undergraduate health degrees, as a percentage of employed people in the relevant workforce, 1993 to 2005 (*NHPC indicator 3.25 part 1*)

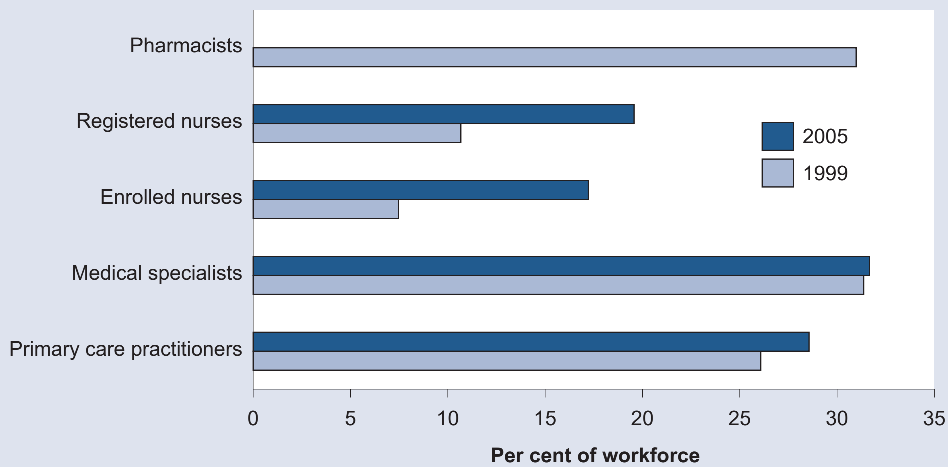
How many health professionals will be retiring from the workforce?

The main reason for permanent loss from the health workforce is the retirement of older workers (although turnover among younger age groups is also likely to occur). Older people do not leave the workforce in a steady stream—the pattern of exits depends on the age profile of the workforce and other factors such as affordability of, and desire for, early retirement.

As with the Australian population and the overall labour force, the health workforce has been ageing. That is, larger proportions of the workforce are in older age groups than previously, because of the progression of the large post-war 'baby boom' cohort through the age groups. For example, in 2006, 16% of the health workforce was aged 55 years and over, compared with 12% in 2001. The health workforce is ageing more quickly than the non-health workforce (for which the proportion aged 55 years and over rose from 11% in 2001 to 14% in 2005) (Table 8.21).

Of course, many health workers will be replaced by new entrants, but concerns remain that the health needs of the population will grow as the proportion of older people increases, and that workforce replacements will be insufficient to serve the growing needs.

The National Health Performance Committee indicator of workforce sustainability mentioned above includes the proportion of the workforce aged 55 years and over in five health professions: primary care practitioners, medical specialists, registered nurses, enrolled nurses and pharmacists (NHPC 2004). This indicator is based on information from the AIHW health labour force surveys, and the data for 1999 and 2005 (the most recent years available) are provided in Figure 8.15 (*NHPC indicator 3.25*). These data show that nearly a third of medical specialists (32%) and primary care practitioners (29%) were aged 55 years and over in 2005. For nurses, the proportion aged 55 years and over doubled over the period, from 11% to 20% for registered nurses and from 7% to 17% for enrolled nurses. Data for pharmacists were available only for 1999, when the proportion was 31%.



Notes

1. Excludes hospital non-specialists and specialists-in-training because of the low proportions aged 55 years and over (less than 4% in 2005).
2. Latest data available for pharmacists are for 1999.

Sources: AIHW Medical, Nursing and Midwifery and Pharmacy Surveys.

Figure 8.15: Proportion of employed medical, nursing and pharmacist workforce aged 55 years and over, 1999 and 2005 (*NHPC indicator 3.25 part 2*)

How many hours do health workers work?

Measuring supply is not just a matter of head counts. Equally important are the number of hours spent working. For example, in some professions, particularly those with a high proportion of females such as nursing, many work part time. In others, such as the medical profession, it is usual to work more than the 'standard' 35 hours per week.

In 2006, health workers worked an average 32.0 hours per week, compared with 34.7 for workers across all other occupations (Table 8.23). The health professions with the longest average working weeks were specialist medical practitioners (45.1 hours), general practitioners (41.1) and dentists (37.4). Those with the shortest working weeks were personal care and nursing assistants (27.4 hours), enrolled nurses (29.5), nursing professionals (29.3), dental assistants (31.0) and other allied health workers (30.5), including occupational therapists, optometrists, speech pathologists and podiatrists.

These differences in the average working week reflect the proportion of female practitioners within each profession. Among the health professions, medical specialists, general practitioners and dentists had the lowest proportion of females (31%, 38% and 25%, respectively). At the other end of the spectrum were the nursing groups (personal care and nursing assistants, enrolled nurses, nursing professionals) and dental assistants, with over 80% of the workforce being female.

Between 2001 and 2006 there was little change in average hours worked in health occupations—down half an hour per week. In terms of full-time equivalents (FTE, see Box 8.9), the combination of changes in numbers and hours worked resulted in a 21% increase in supply overall (from 448,100 FTE in 2001 to 542,200 in 2006).

The FTE rate of the health workforce overall increased by 13% between 2001 and 2006 (from 2,308 to 2,619 per 100,000 population). The FTE rate for medical administrators and nursing directors, in particular, increased by 64% (from 33 to 54 per 100,000 population). Other occupations with high rates of growth in the FTE rate over this period were nursing and personal care assistants (41%), dental practitioners (33%) and social workers (33%).

Box 8.9: Measuring supply: full-time equivalent (FTE) numbers and rates per 100,000 population

The FTE number is the number of full-time workloads provided by health workers. This provides a useful measure of supply as it takes into account both the number of health workers who are working and the hours that they work.

FTE is calculated by: *the number of health workers in a particular category* multiplied by *the average hours worked by health workers in the category* divided by *the hours considered to be full time*. The ABS designates 35 hours per week to be full-time work, and this has been used as the basis for calculating FTE for all occupations where ABS data have been sourced. The AIHW also uses 35 hours per week for estimating FTE, except for medical practitioners, where 45 hours per week is used.

The FTE rate (the number of FTE health workers per 100,000 population) is a measure of supply. By defining supply in terms of the FTE rate, meaningful comparisons of supply can be made across geographical areas and over time. In Table 8.23 the FTE rate is calculated as: *the number of FTE health workers* divided by *the estimated resident population of Australia at 30 June 2001 and 30 June 2006* multiplied by *100,000*.

Table 8.23: Persons employed in health occupations: average hours worked per week and full-time equivalent (FTE) number[(a)] and rate, 2001 and 2006

	2001			2006		
Occupation	**Average hours worked per week**	**FTE number[(a)]**	**FTE rate (per 100,000)**	**Average hours worked per week**	**FTE number[(a)]**	**FTE rate (per 100,000)**
Medical administrators, nursing directors	38.7	6,400	33	39.8	11,100	54
Generalist medical practitioners	42.1	43,500	224	41.1	45,800	221
Specialist medical practitioners	43.9	21,600	111	45.1	26,400	127
Medical imaging workers	34.2	8,000	41	34.0	10,600	51
Dental practitioners	36.9	9,500	49	37.4	13,500	65
Dental associate professionals and assistants	31.1	17,000	88	31.0	21,100	102
Nursing workers: professionals	29.7	154,200	794	29.3	170,100	822
Enrolled nurses	28.2	18,700	96	29.5	25,300	122
Nursing and personal care assistants	28.3	33,600	173	27.4	50,500	244
Pharmacists	38.3	13,700	71	35.6	16,600	80
Physiotherapists	30.4	10,000	51	34.3	12,800	62
Psychologists	32.5	10,300	53	31.5	12,500	61
Other allied health workers[(b)]	31.5	20,900	108	30.5	23,200	112
Complementary therapists	35.5	7,500	39	30.3	7,700	37
Social workers	30.2	8,800	45	32.0	12,400	60
Other health workers[(c)]	35.0	64,500	332	33.5	82,500	399
All health workers	32.5	448,100	2,308	32.0	542,200	2,619
All other occupations	35.3	8,643,800	44,525	34.7	9,484,300	45,815
Total all occupations	**35.1**	**9,091,900**	**46,834**	**34.6**	**10,026,500**	**48,434**

(a) Based on a standard full-time working week of 35 hours.

(b) Includes occupational therapists, optometrists, speech pathologists, podiatrists, dietitians and other health professionals.

(c) Includes medical scientists, occupational and environmental health professionals, medical technical officers, ambulance officers and paramedics, Aboriginal and Torres Strait Islander health workers, massage therapists, primary products inspectors and safety inspectors.

Source: Unpublished data from ABS Labour Force Surveys, 2001 and 2006.

Health workforce shortages

A health workforce shortage exists when the available health workforce supply is insufficient to meet the demand for health workers. Assessing the level of demand and the appropriate level of workforce that is therefore needed is not straightforward and requires sophisticated modelling. Recent work in this area has provided evidence that many health occupations are, in fact, experiencing shortages. For example it has been estimated that there was a shortage of between 10,000 and 12,000 nurses for 2006, rising to an expected shortage of between 10,000 and 13,000 nurses for 2010 (AHWAC 2004). Similarly there is an estimated shortage of between 800 and 1,300 general practitioners (AMWAC 2005).

Another approach used for identifying shortages in the health workforce has been to assess unmet demand for health workers reported by heath service organisations. In 2007, the Department of Education, Employment and Workplace Relations (DEEWR) consulted with these organisations and identified shortages in a broad range of health occupations across all states and territories (Table 8.24).

Table 8.24: Skills in demand, health occupations, states and territories, 2006

Occupation	NSW	Vic	Qld	WA	SA	Tas	NT	ACT
Medical imaging worker	S	S	S	M-D	D	S	S	S
Dental worker: professional	S	M-D,R	S	S	S	S	S	S
Dental worker: associate professional and dental assistants(a)	*	*	*	*	*	*	*	*
Nursing worker: professional								
Registered nurse	S	S	S	S	S	S	S	S
Registered midwife	S	S	S	S	S	S	S	S
Mental health nurse	S	S	S	S	S	S	S	S
Enrolled nurse	M, R-D	*	D	S	S	D	*	*
Pharmacist	S	R	S	R	S	S	D	D
Physiotherapist	S	S	S	S	R	S	S	S
Other allied health occupations								
Occupational therapist	S	S	S	S	S	S	D	D
Speech pathologist	S	S	S	*	D	S	S	S
Podiatrist	S	S	S	S	*	S	S	S
Social worker	*	R-D	*	*	*	*	R-D	R-D

(a) DEEWR note that dental workers (associate professionals and dental assistants) are also in demand in Australia. However, there is insufficient information to establish whether shortages exist at the state level.

Note: S = statewide shortage, M = shortage in metropolitan (capital city) areas, R = shortage in regional areas, D = recruitment difficulty, R-D = recruitment difficulty in regional areas, * = no shortage was identified.

Source: DEEWR 2007.

Selected health labour forces

The AIHW health labour force surveys provide more detailed data than the ABS Labour Force Survey on the demographic characteristics, working patterns and distribution of some of the major health professions. The AIHW surveys cover all persons registered (or 'enrolled' in the case of enrolled nurses) with the relevant professional registration board. The surveys exclude those who are qualified but not registered. Therefore they include some people who are registered in the profession but not employed. For example, in 2005, 67,890 persons were registered as medical practitioners in Australia, of whom 60,252 (89%) reported that they were working in medicine at the time of the survey. In the same year there were 285,619 registered and enrolled nurses, of whom 244,360 (86%) were employed in nursing.

Medical labour force

In 2005 there were an estimated 60,252 employed medical practitioners, an increase of 25% since 1997 (Table 8.25). However, the FTE supply of practitioners increased by just over 4% in the same period, from 275 FTE per 100,000 population in 1997 to 287 in 2005. A comparison of the two measures is shown in Figure 8.16.

Table 8.25: Employed medical practitioners: selected characteristics, 1997[(a)] and 2005

Type of practitioner	Number	Per cent female	Average age	Per cent aged 55 years and over	Average hours per week	FTE number[(b)]	FTE rate[(c)]
				1997			
Clinicians	44,194	28	45	21	*48*	47,140	255
Primary care practitioners	*20,134*	*33*	*46*	*23*	*45*	*19,999*	*108*
Hospital non-specialists	*4,321*	*42*	*31*	*4*	*51*	*4,878*	*26*
Specialists	*15,155*	*16*	*50*	*30*	*50*	*16,839*	*91*
Specialists-in-training	*4,584*	*33*	*32*	*2*	*54*	*5,481*	*30*
Non clinicians	4,004	29	48	29	42	3,773	20
Total	**48,198**	**28**	**45**	**22**	**48**	**50,983**	**275**
				2005			
Clinicians	56,084	33	45	23	44	54,713	268
Primary care practitioners	*22,589*	*37*	*49*	*29*	*40*	*20,029*	*98*
Hospital non-specialists	*6,632*	*48*	*32*	*4*	*46*	*6,808*	*33*
Specialists	*19,943*	*21*	*49*	*31*	*46*	*20,253*	*99*
Specialists-in-training	*6,920*	*41*	*32*	*0*	*49*	*7,551*	*37*
Non clinicians	4,168	33	48	29	42	3,853	19
Total	**60,252**	**33**	**45**	**24**	**44**	**58,511**	**287**

(a) 1997 is the earliest year for which estimates comparable to 2005 are available, because of changes in estimation processes.

(b) Based on a standard full-time working week of 45 hours.

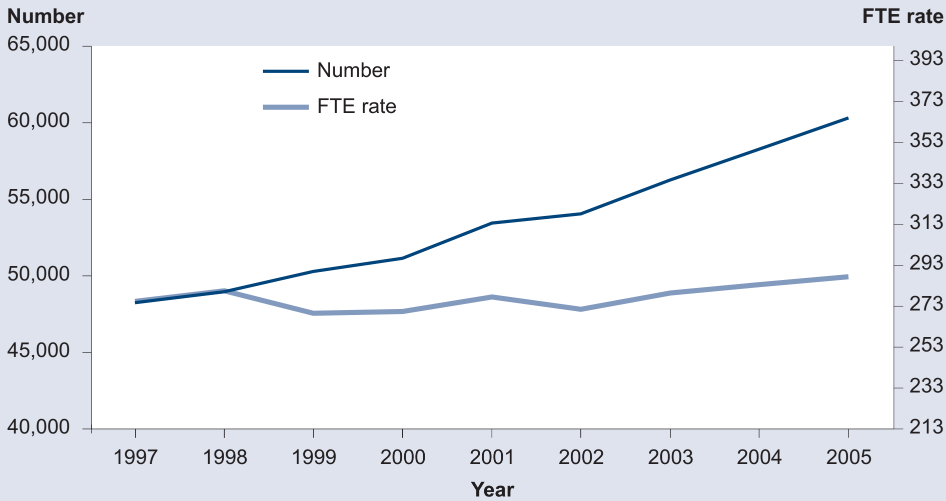
(c) FTE per 100,000 population.

Sources: AIHW Medical Labour Force Surveys 1997 and 2005.

The smaller increase in the FTE rate for medical practitioners over this period, despite the large increase in their numbers, is due to the growth in the population and declining average hours worked. Between 1997 and 2005, the estimated resident population of Australia increased by nearly 10%. During the same period, medical practitioners reduced their average working week by 4 hours (from 48 to 44) (Table 8.25). Both male and female medical practitioners reduced their average working week, by 4 and 2 hours respectively.

In 2005, about a third of all employed medical practitioners were classified as primary care practitioners (37%), a third were specialists (33%), and the remainder were specialists-in-training (11%), non-specialists working in hospitals (11%), and non-clinician doctors (7%) comprising administrators, teachers, researchers, public and occupational health physicians and others (Table 8.25).

Between 1997 and 2005, the number of primary care clinicians rose by an estimated 12% (from 20,134 to 22,589), and their working hours (as with other clinicians) declined. As a result of these factors, and the increase in the Australian population, supply of this group declined from 108 to 98 FTE per 100,000 population over the period. The supply of specialists, specialists-in-training and hospital non-specialists increased over the period.



Sources: AIHW Medical Labour Force Surveys, 1997 to 2005.

Figure 8.16: Employed medical practitioners: number and FTE rate by year, 1997 to 2005

Medical practitioners are not evenly distributed across Australia, contributing to different levels of health-care access for people living in different geographical areas (see also chapters 3 and 7). The supply of medical practitioners in Australia in 2005 heavily favoured Major Cities, with 335 FTE per 100,000 population. This was much higher than the rates of 181, 153 and 148 in Inner Regional, Outer Regional and Remote/Very Remote areas respectively (Table S56). The supply of primary care practitioners was more even across the geographic regions, ranging from 84 FTE per 100,000 population in Outer Regional areas to 100 in Major Cities.

Over the period from 1997 to 2005, the supply of primary care practitioners in Remote and Very Remote areas increased (from 80 to 92 FTE per 100,000 population), whereas supply declined in the other areas, and nationally. A number of incentives were provided during this period for medical practitioners to practice in remote areas, and these may be having some effect on supply.

The supply of specialists, specialists-in-training and hospital non-specialists either increased or remained stable from 1997 to 2005, in all regions.

Nursing labour force

As shown earlier, nurses are by far the main occupational group in the health workforce. There are two main types of nurses, registered and enrolled nurses. Enrolled nurses typically work alongside registered nurses to provide basic nursing care, undertaking less complex tasks than registered nurses.

In 2005 there were an estimated 244,360 employed nurses, an increase of 10% since 1997 (Table 8.26). Between 1997 and 2005 there was a 13% increase in the number of registered nurses, whereas the number of enrolled nurses declined slightly. In 2005 registered nurses made up 81% of the nursing labour force.

Nationally, the supply of nurses increased 7%, rising from 1,054 FTE nurses per 100,000 population in 1997 to 1,133 in 2005. The majority of this increase occurred after 2001 (Table S60). Although the increase in the number of employed nurses matched population growth (both being 10% over the period), their average working hours increased from 31 to 33 hours per week, leading to the overall increase in supply (Table 8.26).

Table 8.26: Employed registered and enrolled nurses: selected characteristics, 1997[(a)] and 2005

Type of nurse	Number	Per cent male	Average age	Per cent aged 55 years and over	Average hours per week	FTE number[(b)]	FTE rate[(c)]
				1997			
Registered	176,217	8	41	9	31	156,078	843
Enrolled	46,311	6	40	6	29	38,637	209
Total	**222,528**	**8**	**40**	**9**	**31**	**195,189**	**1,054**
				2005			
Registered	198,315	8	45	20	33	188,683	928
Enrolled	46,044	7	46	17	32	41,572	204
Total	**244,360**	**8**	**45**	**19**	**33**	**230,396**	**1,133**

(a) 1997 is the earliest year for which comparable estimates to 2005 are available, because of changes in estimation processes.

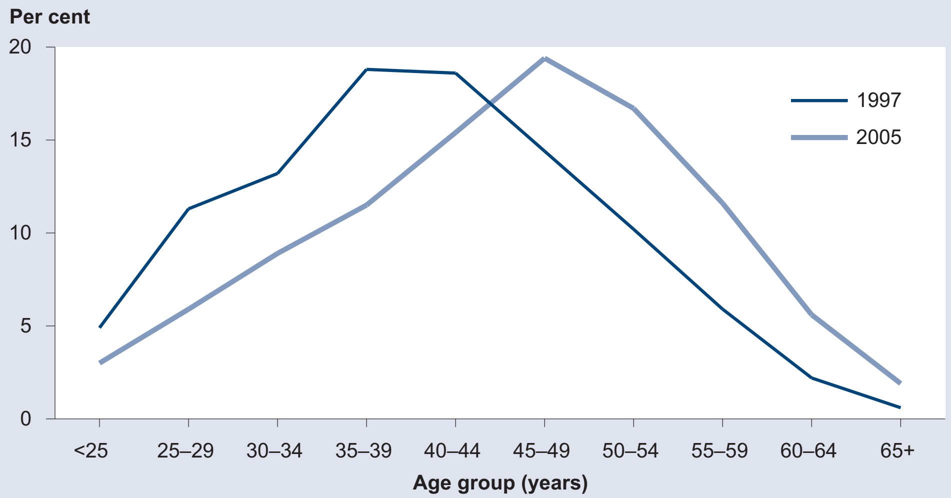
(b) Based on a standard full-time working week of 35 hours.

(c) FTE per 100,000 population.

Sources: AIHW Nursing Labour Force Surveys 1997 and 2005.

The ageing of the Australian nursing workforce is illustrated in Figure 8.17. The peak age group for employed nurses shifted from the 35–39 year group in 1997 to the 45–49 year group in 2005. In addition, the proportion of employed nurses who were aged 55 years and over increased markedly from 9% in 1997 to 19% in 2005 (Table 8.26). Nursing has remained overwhelmingly a female occupation, with just 8% of employed nurses being males.

Unlike with some health professions, the supply of nurses is evenly spread across urban and remote regions. In 2005, the supply was highest in Very Remote areas (1,177 FTE nurses per 100,000 population) and lowest in Major Cities (1,074) (Table S59).



Sources: AIHW Nursing Labour Force Surveys, 1997 and 2005.

Figure 8.17: Age distribution of employed nurses, 1997 and 2005

Dental labour force

The dental labour force comprises dentists, dental therapists, dental hygienists and dental prosthetists. Information about dentists is collected annually from registration boards in each state and territory. For allied dental practitioners, no uniform registration currently exists across jurisdictions. Therefore, information about dental occupations other than dentists is derived from a range of sources including professional associations, dental boards and state health departments. At the time of publication, information on allied dental practitioners was not available for 2005 and hence 2003 data are reported. For dentists, however, 2005 estimates were available.

In 2005, an estimated 10,074 dentists were employed in Australia, a 12% increase in number since 2000 (tables 8.27 and S62). The numbers in the allied dental professions were much lower, and, for two of these—dental therapists and dental prosthetists—the numbers declined between 2000 and 2003.

Table 8.27: Employed dental labour force: selected characteristics, 2003 or 2005[(a)]

Dental occupation and year	Number	Per cent female	Average age	Average hours per week	Dentists per 100,000 population	FTE number[(b)]	FTE rate[(c)]
Dentists (2005)	10,074	28	44	38	50	11,053	54
Dental therapists (2003)	1,242	99	40	29	6	1,040	5
Dental hygienists (2003)	577	97	36	29	3	485	2
Dental prosthetists (2003)	795	9	49	43	4	975	5

(a) Data for allied dental practitioners were not available for 2005 and therefore 2003 data have been reported.

(b) Based on a standard full-time working week of 35 hours.

(c) FTE per 100,000 population.

Sources: AIHW DSRU Dental Labour Force data collections, 2003, 2005.

The distribution of the dental labour force in terms of the number of dentists per 100,000 population varied across geographic regions (Table S63). In 2005, dentists were concentrated in Major Cities, where there were nearly three times the rate (59 per 100,000) in Remote and Very Remote regions (20). This pattern was similar in 2003 for dental hygienists. In contrast, dental therapists and dental prosthetists were more evenly spread across geographic regions.

In 2005, 28% of employed dentists were female (Table 8.27), compared with 23% in 2000. Female dentists were on average 38 years of age and worked 34 hours per week. In contrast, male dentists were on average 47 years of age and worked 41 hours per week. For the allied dental professions, dental therapists and dental hygienists were overwhelming female (99% and 97%, respectively in 2003), worked on average 29 hours per week, and were younger than dentists and dental prosthetists (40 and 36 years of age, respectively). Dental prosthetists however, tended to be mainly male (91%), work longer hours (43 hours per week) and be on average older (49 years) than the other dental professions.

Allied health labour force

As Australia moves to more flexible and integrated models of health care and service delivery, information on the size and characteristics of the allied heath workforce is increasingly important. The allied health workforce has been described as 'allies in health' who work alongside medical practitioners and nurses to provide the best health care to Australians (AHPA 2006). It includes workers from a broad range of professions (Box 8.10).

This section presents information on four of the allied health professions for which data are available from recent AIHW labour force surveys publications—occupational therapists, physiotherapists, psychologists and podiatrists.

Box 8.10: Scope of the allied health workforce

Recognising the limited understanding of the allied health workforce, the Australian Health Ministers' Advisory Council (AHMAC) commissioned the Australian Health Workforce Advisory Committee (AHWAC) to review this workforce. After considering a wide range of definitions currently in use, the AHWAC report provided a list of health professions that could be considered to make up the Australian allied health workforce:

> Audiology, dietetics and nutrition, occupational therapy, orthoptics, orthotics and prosthetics, hospital pharmacy, physiotherapy, podiatry, psychology, radiography, speech pathology and social work.

This list has been used as the basis for reporting on the allied health workforce in this publication.

The AHWAC report concluded that further work was required to clearly define the allied health workforce and the professions that constitute it. In particular, they noted that there are other health professions that seem to fit most definitions of allied health but are not necessarily included in stakeholders' listings of allied health professions. These include chiropractors and optometrists (AHWAC 2006).

The peak body representing the allied health professions in Australia, Allied Health Professions Australia Ltd, has a membership that is very close to the AHWAC list, with the addition of exercise physiologists, radiation therapists, and sonographers (AHPA 2006).

Not all the allied health professions require practitioners to be registered in any or all states and territories, which limits the usefulness of registration-based data for these professions.

Occupational therapists

Occupational therapists are allied health professionals who teach people how to return to normal activities after injury or illness, using therapy and rehabilitation.

The latest AIHW labour force survey data on occupational therapists are for 2002–03 (AIHW 2006a). Because this is a profession where most jurisdictions in Australia do not require registering, registration data were not available to produce national estimates. As a result, the following information refers only to the 3,107 respondents to the survey who stated that they were employed in occupational therapy. The survey was of all occupational therapists in Queensland, South Australia and the Northern Territory (that is, those jurisdictions where they are registered) and members of Occupational Therapy Australia in the other jurisdictions. The vast majority of employed respondents were female (94%) and reported working in the public sector (72%), most commonly in hospitals, community health services and rehabilitation services. Their average age was 37 years and they worked 36 hours per week, on average.

Psychologists

Psychologists are professionals with expertise in human behaviour who assess and treat people with mental health problems and help people and groups enhance their performance. There were 13,900 clinical and non-clinical psychologists in Australia in 2006, compared with 11,100 in 2001, an increase of around 25% (Table 8.21).

The latest AIHW survey data available on registered psychologists were collected in 2003 from New South Wales, Victoria, Queensland, South Australia and the Australian Capital Territory (AIHW 2006b). In 2003, 71% of employed psychologists in these jurisdictions surveyed were female. Their average age was 44 years, with the females being younger than the males, on average. They worked an average of 36 hours per week, with the males generally reporting longer hours than the females (39 hours compared with 34) (AIHW 2006b, 2007c).

Physiotherapists

Physiotherapists are allied health professionals who assess, diagnose and treat people with movement problems resulting from an injury, surgery or a health condition. Based on the ABS Labour Force Survey, there were an estimated 13,100 physiotherapists in Australia in 2006, compared with 11,500 in 2001, an increase of around 14% (Table 8.21).

The AIHW surveyed registered physiotherapists in 2002, in conjunction with the state and territory registration boards and health departments in New South Wales, Victoria, Queensland, South Australia and the Australian Capital Territory. The survey found that employed physiotherapists were, on average, aged 39 years and mostly female (76%). They were over-represented in metropolitan areas with 95% of physiotherapists working in these areas. The average hours they worked ranged from 32 in Queensland to 36 in Victoria (AIHW 2006c).

Podiatrists

Podiatrists, also known as chiropodists, are health-care professionals who assess, diagnose and treat disorders of the lower leg and foot that have resulted from developmental abnormalities, disease or injury.

The latest AIHW labour force survey data available on podiatrists are for 2003 (AIHW 2006d), when a survey was conducted in all states except Western Australia. For states participating, 63% of employed podiatrists were female. Their average age ranged from 38 years in Queensland to 40 in Tasmania. Employed podiatrists in 2003 worked, on average, from 37 hours a week (New South Wales) to 42 (Tasmania).

Comparison with other OECD countries

It is difficult to compare the numbers of health professionals in Australia with those in other countries because of differences in how each profession is defined and how workers are registered. The Organisation for Economic Co-operation and Development (OECD) health database includes information on the numbers of health workers in member countries, including those with economies and health systems similar to Australia's—New Zealand, Canada, the United States of America and the United Kingdom. In 2005, Australia had higher numbers of general practitioners and nurses relative to population than did the four other countries (Table 8.28). The rate of dentists was similar in all five countries, whereas that of medical specialists ranged from 0.7 to 1.7 per 100,000, with Australia in the middle of that range.

Australia's higher rate of general practitioners may be due to how these professions are structured in these five countries, or to differences in definitions. The definition of general practitioners used by the OECD includes those medical practitioners working in the ambulatory sector or in hospitals. Of the 29,221 Australian 'general practitioners' in the OECD figures for 2005, 22,589 were 'primary care practitioners' and the remaining 6,632 were non-specialist clinicians working in hospitals (including interns, resident medical officers and career medical officers). Some countries do not include non-specialist clinicians working in hospitals among general practitioners.

Table 8.28: Health professionals employed in selected OECD countries, number and rate[(a)], 2000 and 2005

Occupation/year	Australia		New Zealand		Canada		USA		United Kingdom	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
General practitioners[(b)]										
2000	26,202	1.4	3,166	0.8	30,636	1.0	262,922	0.9	37,236	0.6
2005	29,221	1.4	3,013[(c)]	0.7[(c)]	33,508	1.0	287,706	1.0	42,566	0.7
Medical specialists										
2000	21,170	1.1	2,653	0.7	33,818	1.1	384,508	1.4	77,922	1.3
2005	26,863	1.3	2,946[(c)]	0.7[(c)]	36,111	1.1	415,796	1.5	102,074	1.7
Dentists										
2000	8,991	0.5	1,591	0.4	17,314	0.6	168,000	0.6	25,234	0.4
2005	10,069	0.5	1,662[(d)]	0.4[(d)]	18,688	0.6	n.a.	n.a.	28,463	0.5
Nurses										
2000	200,910	10.5	36,796	9.6	310,887	10.1	2,249,440	8.0	495,000	8.4
2005	222,974	10.9	38,484[(c)]	9.5[(c)]	321,585	10.0	n.a.	n.a.	546,717	9.1

(a) Number of workers per 1,000 population.

(b) Figures for general practitioners for Australia include 6,632 hospital-non-specialists to be consistent with the OECD definition.

(c) 2004 figures.

(d) 2003 figures.

Sources: OECD 2007; 2005 data for Australia are from AIHW Medical and Nursing and Midwifery Labour Force Surveys, 2005 and AIHW DSRU Dental Labour Force data collection 2005.

Primary carers of people with disability

People with disability often receive care and assistance from family members. The provision of unpaid care by family members is an important complement to formal services.

A person who provides informal care or assistance to an individual because of that individual's age, illness or disability is known as a carer. Any assistance received from family or friends living in the same household is considered to be informal assistance, whether or not the provider was paid (ABS 2004). In the 2003 Survey of Disability, Ageing and Carers, the 'primary carer' was defined as the person who provided the most ongoing assistance with core activities of self-care, mobility and communication. In 2003, an estimated 472,500 people, or 3.0% of Australians aged 15 years and over, were primary carers (*NHPC indicator 2.04,* Table 8.29).

Females were more likely than males to be primary carers. There were 337,100 female primary carers (4% of females aged 15 years and over) compared with 135,400 males (2%). About 42% of primary carers were caring for their spouse, 26% for a parent and 23% for a child. Many people reported spending long hours in the caring role. Of primary carers living with their main care recipients: 48% spent on average 40 hours or more per week caring, and 21% spent 20–39 hours per week. Over a third of primary carers had been in the caring role for 10 years or more. About 40% of primary carers themselves had a disability; almost a quarter of those had a severe or profound core activity limitation.

Primary carers of working age had a lower labour force participation rate (39%) than people who were not carers (68%) (ABS 2004; AIHW 2007d). This may have impacts on their economic circumstances and those of their family.

Table 8.29: Primary carers[(a)] of people with a disability, by age and sex, 2003 (*NHPC indicator 2.04*)

	Males	Females	Persons	Males	Females	Persons
Age group	**Number ('000)**			**Per cent of population**		
15–24	*4.5	13.5	18.1	*0.3	1.0	0.6
25–34	*9.0	35.1	44.1	*0.6	2.4	1.5
35–44	17.0	65.6	82.6	1.2	4.4	2.8
45–54	32.2	82.7	114.9	2.4	6.2	4.3
55–64	25.0	74.8	99.7	2.5	7.6	5.0
65–74	22.9	38.6	61.5	3.6	5.7	4.7
75–84	23.6	25.6	49.1	6.2	5.0	5.5
85+	**	**	*2.5	**	**	*0.9
Total	**135.4**	**337.1**	**472.5**	**1.7**	**4.2**	**3.0**

* Estimates have a relative standard error between 25% and 50% and should be interpreted with caution.

** Estimates have a relative standard error greater than 50% and are considered too unreliable for general use.

(a) A primary carer is a person who provides the most informal assistance. The assistance has to be ongoing, or likely to be ongoing, for at least 6 months.

Note: No information was available regarding primary carers aged under 15 years.

Source: AIHW analysis of ABS 2003 Survey of Disability, Ageing and Carers confidentialised unit record file.

References

ABS (Australian Bureau of Statistics) 1997. Australian standard classification of occupations, 2nd edition. ABS cat. no. 1220.0.

ABS 2004. Disability, ageing and carers: summary of findings, Australia 2003. ABS cat. no. 4430.0. Canberra: ABS.

ABS 2006. Australian and New Zealand standard industry classification. ABS cat. no. 1262.0. Canberra: ABS.

ABS 2007. National income, expenditure and product, March quarter 2007. ABS cat. no. 5206.0. Canberra: ABS.

AHPA (Allied Health Professions Australia) 2006. 2006 Annual report. Melbourne: AHPA. AHWAC (Australian Health Workforce Advisory Committee) 2004. Nursing workforce planning in Australia. AHWAC Report 2004.1. Sydney: AHWAC.

AHWAC (Australian Health Workforce Advisory Committee) 2006. The Australian allied health workforce: an overview of workforce planning issues. AHWAC Report 2006.1. Sydney: AHWAC.

AIHW (Australian Institute of Health and Welfare) 2006a. Occupational therapy labour force 2002–2003. Cat. no. HWL 35. Canberra: AIHW.

AIHW 2006b. Psychology labour force 2003. Cat. no. HWL 34. Canberra: AIHW.

AIHW 2006c. Physiotherapy labour force 2002. Cat. no. HWL 37. Canberra: AIHW.

AIHW 2006d. Podiatry labour force 2002. Cat. no. HWL 36. Canberra: AIHW.

AIHW 2007a. Health expenditure Australia, 2005–06. Cat. no. HWE 37. Canberra: AIHW.

AIHW 2007b. Aboriginal and Torres Strait Islander Health Performance Framework, 2006 report: detailed analyses. Cat. no. IHW 20. Canberra: AIHW.

AIHW 2007c. Australia's welfare 2007. Cat. no. AUS 93. Canberra: AIHW.

AIHW 2007d. Mental health services in Australia 2004–05. Cat. no. HSE 47. Canberra: AIHW.

AIHW 2008. Expenditure on health for Aboriginal and Torres Strait Islander peoples 2004–05. Cat. no. HWE 40. Canberra: AIHW.

AIHW (in press). Health system expenditure on disease and injury in Australia, 2004–05. Canberra: AIHW.

AMWAC (Australian Medical Workforce Advisory Committee) 2005. The general practice workforce in Australia: supply and requirements to 2013. AMWAC Report 2005.2 Sydney: AMWAC.

COAG (Council of Australian Governments) 2006. Council of Australian Governments, Communiqué, 14 July 2006. Viewed 3 May 2007, <www.coag.gov.au>.

DEEWR (Department of Education, Employment and Workplace Relations) 2007. Skills in demand. Canberra: DEEWR.

DoHA (Australian Government Department of Health and Ageing) 2007. Viewed 3 January 2008, <www.health.gov.au>.

DVA (Department of Veterans' Affairs) 2007. Annual report. 2006–07. Canberra: DVA.

National Review of Nursing Education 2002. National review of nursing education 2002: our duty of care (Patricia Heath, chair). Canberra: Department of Education, Science and Training.

NHPC (National Health Performance Committee) 2004. National report on health sector performance indicators 2003. AIHW cat. no. HWI 78. Canberra: AIHW.

OECD (Organisation for Economic Co-operation and Development) 2007. OECD health data 2007. Paris: OECD.

PHIAC (Private Health Insurance Administration Council) 2001. Annual report 2000–01. Canberra: AusInfo.

PHIAC 2002. Annual report 2001–02. Canberra: AusInfo.

PHIAC 2003. Annual report 2002–03. Canberra: AusInfo.

PHIAC 2004. Annual report 2003–04. Canberra: AusInfo.

PHIAC 2005. Annual report 2004–05. Canberra: AusInfo.

PHIAC 2006. Annual report 2005–06. Canberra: AusInfo.

PHIAC 2007. PHIAC A quarterly reports. Canberra. Viewed 4 November 2007, <www.phiac.gov.au>.

Productivity Commission 2005. Australia's health workforce. Research report. Canberra: Productivity Commission.

Treasury 2002. Intergenerational report. Canberra: The Treasury.

Vos T, Goss, J, Begg, S & Mann N (in press). Projections of health care expenditure by disease for Australia to 2033. Canberra: AIHW.

9

Health system performance

The earlier chapters of this report provide detailed statistics and information on the health status of Australia's population, on determinants of Australia's health status and on health services provided in Australia.

This chapter summarises some of those details to provide an integrated picture of the nature and performance of the health system and its impact on the health of the population. It uses a set of 44 indicators designed by the National Health Performance Committee (NHPC) for reporting to Australia's health ministers. It also uses the NHPC's National Health Performance Framework (NHPC 2001) to group the indicators into three 'tiers' covering health status and outcomes, determinants of health, and health system performance.

The NHPC previously used the set of indicators in the *National report on health sector performance indicators 2003* (NHPC 2004). At the request of Australia's health ministers, the AIHW is now assuming this national reporting role in *Australia's health*, starting with this dedicated chapter.

The chapter begins with a brief description of the NHPC's framework and criteria for selecting indicators. The indicator statistics are then presented according to the framework's tiers. The presentation is shaped by the major questions about performance: 'Where are we improving and by how much?', 'Is performance the same for different population groups?', and 'How does Australia compare internationally?'

Detailed information on the indicators is included in the preceding chapters and their location is shown in tables 9.3, 9.5 and 9.7.

9.1 The National Health Performance Framework and indicators

National health performance framework

The National Health Performance Framework (Table 9.1) was developed by the NHPC as a structure to guide the understanding and evaluation of the health system, making it easier to determine how well the system is performing (NHPC 2001). It is broadly consistent with the framework used for this book, as described in Chapter 1.

The health status of the population is of ultimate interest in evaluating health system performance—a measure of success or failure of efforts to improve the population's health. Hence, the framework encompasses tiers for health status and the determinants of health, as well as a third tier that focuses on the health system interventions that influence health status and determinants of health, both for individuals and at the population level.

Questions are used to describe the focus of the three tiers and to highlight that equity is considered integral to each. Each tier also has a number of 'dimensions' or subcategories. They are used to guide the development and selection of indicators that can then be used together to answer each tier's questions.

Table 9.1: National Health Performance Framework

Health status and outcomes (Tier 1)

How healthy are Australians? Is it the same for everyone? Where is the most opportunity for improvement?

Health conditions	***Human function***	***Life expectancy and wellbeing***	***Deaths***
Prevalence of disease, disorder, injury or trauma or other health-related states	Alterations to body structure or function (impairment), activities (activity limitation) and participation (restrictions in participation)	Broad measures of physical, mental and social wellbeing of individuals and other derived indicators such as disability-adjusted life expectancy	Age- and/or condition-specific mortality rates

Determinants of health (Tier 2)

Are the factors determining health changing for the better? Is it the same for everyone? Where and for whom are they changing?

Environmental factors	***Socioeconomic factors***	***Community capacity***	***Health behaviours***	***Person-related factors***
Physical, chemical and biological factors such as air, water, food and soil quality resulting from chemical pollution and waste disposal	Socioeconomic factors such as education, employment, per capita expenditure on health and average weekly earnings	Characteristics of communities and families such as population density, age distribution, health literacy, housing, community support services and transport	Attitudes, beliefs, knowledge and behaviours, e.g. patterns of eating, physical activity, excess alcohol consumption and smoking	Genetic-related susceptibility to disease and other factors such as blood pressure, cholesterol levels and body weight

Health system performance (Tier 3)

How well is the health system performing in delivering quality health actions to improve the health of all Australians? Is it the same for everyone?

Effective	***Appropriate***	***Efficient***
Care, intervention or action achieves desired outcome	Care, intervention or action provided is relevant to the client's needs and based on established standards	Achieves desired results with most cost-effective use of resources
Responsive	***Accessible***	***Safe***
Service provides respect for persons and is client-oriented, including respect for dignity, confidentiality, participation in choices, promptness, quality of amenities, access to social support networks and choice of provider	Ability of people to obtain health care at the right place and right time irrespective of income, physical location and cultural background	The avoidance or reduction to acceptable limits of actual or potential harm from health-care management or the environment in which health care is delivered
Continuous	***Capable***	***Sustainable***
Ability to provide uninterrupted, coordinated care or service across programs, practitioners, organisations and levels over time	An individual's or service's capacity to provide a health service based on skills and knowledge	System's or organisation's capacity to provide infrastructure such as workforce, facilities and equipment, and to be innovative and respond to emerging needs (research, monitoring)

Source: NHPC 2001.

Health system performance indicators

Performance indicators are defined as 'statistics or other units of information which reflect, directly or indirectly, the extent to which an anticipated outcome is achieved or the quality of the processes leading to that outcome' (NHPC 2001). Outcomes and quality of processes can be difficult to measure, so indicators are not necessarily accurate measures of them. In addition, the extent to which outcomes can be attributed to interventions varies (Box 9.1). Nevertheless, performance indicators can provide useful information to guide decision making.

Box 9.1: The health system and outcomes

How much credit or blame can the health system take for our health? Health status and health determinants are often described as 'outcomes' because the health system aims at improving them.

As discussed in chapters 1 and 4, many factors can influence health. The health system is one influence, and probably a major one for many people. However, the system itself has many parts, involving many forms of prevention and treatment, and health can also be influenced by factors outside the health system such as transport safety.

At a broad level, this makes it difficult to know which aspects of our health status can be attributed to the health system rather than to other influences in our lives, to what extent, and to which parts of the health system.

Outcomes can be clear when the focus is narrow. For example, a clinical trial can show the benefit of a particular medication or surgical procedure for a particular health condition. In contrast, some of the NHPC 'outcome' indicators aim at providing information about the performance of the health system as a whole and cannot be used to assess the extent to which the health system, or any particular component of the system, can take the credit or blame.

Despite these complexities, we know that preventive and treatment approaches are increasingly being based on strong scientific evidence that they work. This makes it reasonable to conclude that many of the health improvements shown in this chapter do indeed reflect the health system to some extent.

The 44 indicators here cover all the components of the health sector identified by the NHPC—acute care, continuing care, primary care and population health—but not all components of the health sector have indicators in every dimension.

The indicators were selected by the NHPC using specific criteria such as they must be measurable for diverse populations, be understood by people who need to act, be relevant to policy and practice, and reflect results of actions when measured over time (NHPC 2001). In addition, as a set, they were designed to reflect a balance of indicators for all appropriate parts of the framework, and to provide feedback on where the system is working well, as well as on areas for improvement.

A full description of each indicator, including its definition and rationale, can be found in the *National report on health sector performance indicators 2003* (NHPC 2004).

9.2 Overview of indicators by tier

Summary information about the NHPC health system performance indicators is presented in this chapter using the three tiers of the framework.

For each tier, a table is included summarising the long-term changes in the indicator levels. Most changes are described as 'favourable', 'unfavourable' or 'no trend', depending on whether the change was in accordance with the goals of the health system to improve the health of Australians. For some indicators, it is not possible to determine whether there was a meaningful change. These indicators are reported as having 'no trend' and their level may be stable or fluctuating. For others, the NHPC's 2003 report does not indicate what direction of change in an indicator would represent a favourable change; for example, if the percentage of people giving informal care rises over time (Indicator 2.04), is that a favourable or unfavourable change? For some indicators no new data were available since the previous report, and for others the new data that were available have been collected or calculated differently, and thus are not comparable to the 2003 figures.

This presentation also includes a summary of previous and current rates for the performance indicators. Previous rates for each indicator have generally been taken from the 2003 report which used varying reference years, depending on data availability. Similarly, the current rates described in this report reflect data from varying years, and the interval periods for each indicator are not consistent.

This presentation further includes comparisons for Indigenous peoples compared with other Australians, variations for other demographic groups, and international comparisons, where possible. Some of the indicators presented in this chapter are age-standardised, but the population base and year used vary between indicators. More detail on specific age-standardisation methods for indicators are available in their corresponding chapter.

Links to the detailed information on each indicator plus additional sources of data are also provided for easy reference.

Tier 1: Health status and outcomes

This tier covers health status, as the overall measure of Australia's success or failure in improving the population's health, through both the health sector and other sectors. The indicators can also be viewed as indicating health outcomes; that is, as wholly or partially attributable to health service interventions (see Box 9.1).

Tier 1 of the framework has four components that bring together a range of indicators that summarises the impact of disease and injury on Australians:

- *Health conditions* are measured through the incidence of selected diseases (and could also include measures of the prevalence of diseases).
- *Human function* focuses on disability measured as core activity limitation.
- *Life expectancy and wellbeing* incorporates life expectancy as a summary statistic of the overall health status of the population, and a measure of psychological distress as an indicator of overall wellbeing.
- *Deaths* information focuses on avoidable and premature death, including infant mortality, and deaths from diseases and injuries that are a focus of the health system.

Table 9.2: Health status and outcomes indicators

Indicator	Favourable trend	No trend	Unfavourable trend	Other
Health conditions: Incidence of heart attacks	✓			
Health conditions: Incidence of cancer			✓	
Human function: Severe or profound core activity limitation				(a)
Life expectancy and wellbeing: Life expectancy	✓			
Life expectancy and wellbeing: Psychological distress		✓		
Deaths: Potentially avoidable deaths				(a)
Deaths: Infant mortality		✓		
Deaths: Mortality for National Health Priority Area diseases and conditions				
Cancers	✓			
Coronary heart disease	✓			
Cerebrovascular disease	✓			
All injuries	✓			
Falls		✓		
Suicide				(a)
Motor vehicle accidents	✓			

(a) Data unavailable or not comparable.

Table 9.3: Health status and outcomes indicators: comparisons

Indicator	Domain and description	Previous and current rates	International comparison	Population variations	Indigenous comparison	Chapter, table or figure in *Australia's health 2008* or other sources
1.01 Incidence of heart attacks	**Health conditions:** Incidence of acute coronary heart disease events ('heart attacks')	Per 100,000 2001: 580.2 2005: 511.0	n.a.	Higher in males	Rate 3 times as high as for other Australians	Chapter 5, Figure 5.3 AIHW 2004 AIHW: Mathur et al. 2006a
1.02 Incidence of cancer	**Health conditions:** Incidence rates for cancer	Per 100,000 Males 1999: 545 2004: 573 Females 1999: 388 2004: 395	Fourth worst rate among OECD countries	Higher in males Higher in rural and remote areas for melanoma, cervical cancer and smoking-related cancers Lower in Very Remote areas	Overall cancer rates lower than for other Australians Rates higher for lung cancer, other smoking-related cancers, and cancers of the thyroid, pancreas, oesophagus, liver and gallbladder Very low incidence of melanoma	Chapter 5, Figure 5.1 AIHW & AACR 2007 AIHW & AACR (forthcoming) 2008

(continued)

Table 9.3 (continued): Health status and outcomes indicators: comparisons

Indicator	Domain and description	Previous and current rates	International comparison	Population variations	Indigenous comparison	Chapter, table or figure in *Australia's health 2008* or other sources
1.03 Severe or profound core activity limitation	**Human function:** Severe or profound core activity limitation by age and sex	1998: 6.1% 2003: 6.3%	n.a.	Higher in females Increases with age with significant increase in those aged 65 years and over	Rates twice as high as in other Australians (people aged 18 years and over in non-remote areas)	Chapter 2, Table 2.9 AIHW 2005a ABS & AIHW 2005
1.04 Life expectancy	**Life expectancy and wellbeing:** Life expectancy at birth	*Males* 1999–2001: 77.4 years 2003–2005: 78.5 years *Females* 1999–2001: 82.6 years 2003–2005: 83.3 years	Second best in world after Japan	Higher in females Highest in ACT and lowest in NT Higher in urban areas	About 17 years lower than for all Australians	Chapter 2, tables 2.3 and 2.4 ABS 2006a WHO 2007
1.05 Psycho-logical distress	**Life expectancy and wellbeing:** Levels of psychological distress as measured by the Kessler 10 scale	Per cent with distress rated as 'very high' 2001: 3.6% 2004–05: 3.8%	n.a.	Higher in females	n.a.	Chapter 5, Table 5.13
1.06 Potentially avoidable deaths	**Deaths:** Number of potentially avoidable deaths	Per 100,000 *Males* 2001: 232.1 *Females* 2001: 121.1	Better rates than New Zealand, except for Indigenous persons	Increases with age Higher for: – males – disadvan-taged areas – rural and remote areas	Almost 4 times the rate of other Australians	Chapter 2, Table 2.16 Page et al. 2006
1.07 Infant mortality	**Deaths:** Infant mortality rate	Per 1,000 live births 2001: 5.3 2005: 5.0	Better than the OECD average but ranked almost among the worst third of OECD countries	Higher in males	Rate 2.5 to 3 times that for other Australians	Chapter 2, Figure 2.3 ABS 2006a OECD 2007

(continued)

Table 9.3 (continued): Health status and outcomes indicators: comparisons

Indicator	Domain and description	Previous and current rates	International comparison	Population variations	Indigenous comparison	Chapter, table or figure in *Australia's health 2008* or other sources
1.08 Mortality for National Health Priority Area diseases and conditions	**Deaths:** Death rates for National Health Priority Area diseases and conditions	NHPA cancers reported in detail in Chapter 5				
	NHPA cancers	Per 100,000 2001: 104.6 2005: 95.7	Ranked in the better half of OECD countries	Higher in males Higher all-cancer mortality in rural and remote areas Overseas-born Australians have a much lower rate than Australian-born	Rate higher than other Australians for lung cancer and cervical cancer among the NHPA cancers	Chapter 5, Table 5.2 AIHW & AACR 2007 AIHW & AACR (forthcoming) 2008
	Coronary heart disease	Per 100,000 *Males* 2001: 175.7 2005: 136.9 *Females* 2001: 102.5 2005: 80.7	Better than most other OECD countries	Higher in males Higher in disadvantaged areas Higher in rural and remote areas	Rate 3 times that for other Australians	Chapter 5, figures 5.3, 5.4, 5.5 AIHW 2004 AIHW 2007b
	Cerebro-vascular disease	Per 100,000 *Males* 2001: 64.9 2005: 53.3 *Females* 2001: 59.9 2005: 49.3			Rate twice that for other Australians	Chapter 5, Figure 5.5 AIHW 2007b
	All injury	Per 100,000 *Males* 2001: 58.5 2004–05: 50.9 *Females* 2001: 22.2 2004–05: 20.8	In the best third of OECD countries	Higher in older people Increase with remoteness	Rate 2.5 times that for other Australians	Chapter 5, Table 5.22 AIHW 2007b
	Falls	Per 100,000 *Males* 2001: 4.1 2004–05: 5.1 *Females* 2001: 2.4 2004–05: 3.6	n.a.	Rates are very high for older people, particularly those aged 80 years and over	Rate similar for Indigenous and other males and higher for Indigenous females than other females	Chapter 5, Table 5.22 AIHW 2007b
	Suicide	Per 100,000 *Males* 2001: 20.3 2004–05: 15.3 *Females* 2001: 5.3 2004–05: 3.9	n.a.	For males, rates are higher in their 30s and in older age groups	Rate twice that for other Australians	Chapter 5, Table 5.22 AIHW 2007b

Current and previous rates

The 13 indicators in Tier 1 (tables 9.2 and 9.3) show that Australia's health status and outcomes have improved overall since the 2003 report, with a favourable change for most of the indicators. The notable exception was the incidence of cancer, Indicator 1.02, covering all cancers except non-melanoma skin cancers. It showed an unfavourable change over the period between 1999 and 2004, although the level in 2004 was slightly lower than in 1994. Further information on trends in cancer incidence is included in Chapter 5.

Australians are generally living longer; life expectancy at birth increased between 2001 and 2005. Males can now expect to live to 78.5 years on average and females to 83.3 years, an increase of 1.1 years and 0.7 years respectively. The incidence of heart attacks fell from 580 per 100,000 to 511 per 100,000 between 2001 and 2005.

Deaths from diseases and injuries that are National Health Priority Areas (NHPA) provide a means of assessing the performance of programs aimed at these priority areas. Death rates for coronary heart disease and cerebrovascular disease decreased for both males and females between 2001 and 2005. Deaths from cerebrovascular disease fell from 65.2 to 53.3 per 100,000 for males and from 59.9 to 49.3 for females, and coronary heart disease deaths fell from 175.7 to 136.9 per 100,000 for males and 102.5 to 80.7 for females. In contrast to the trend for overall cancer incidence, deaths from NHPA cancers—eight cancers only—fell between 2001 and 2005 from 104.6 to 95.7 per 100,000 persons, reflecting the favourable trend for this indicator. Deaths due to injury over 2001–2004 also show a favourable trend and decreased from 58.5 to 50.9 per 100,000 for males and 22.2 to 20.8 per 100,000 for females.

Although death rates for suicide appear to have fallen, these deaths have been under-enumerated in recent years, so the actual trend in suicide deaths is not clear (ABS 2005).

International comparison

Australia's rank among other countries varies considerably across Tier 1 indicators. Australia rates favourably against other OECD countries on current figures for life expectancy and death rates for NHPA cancers and coronary heart disease. However, Australia rates unfavourably for current rates of cancer incidence and death due to injury. And although Australia's infant mortality rates are lower than the OECD average, they are close to the worst third of member countries on this measure.

Note that the death rates for NHPA cancers place Australia in the better half of OECD countries whereas the incidence for overall cancer places the country in the worst third. This may indicate that Australia's health system compares favourably with other OECD countries in relation to treating cancer, less favourably in relation to preventing it, more favourably in detecting cancer early, or all of these possibilities. It should also be noted that there are hundreds of different cancers and similarly the eight NHPA cancers are quite disparate in their features. This means that rates for overall cancer or for other cancer groupings can mask many variations in success for individual cancers.

Population variations

Tier 1 indicators reflect that people in rural and remote areas have a lower life expectancy and a generally higher incidence of death and disease from reported conditions. This applies to deaths from cardiovascular disease and to cancer incidence and deaths, for example.

Many of the Tier 1 indicator levels also vary with sex and socioeconomic status. Males fare worse than females on all indicators except severe or profound core activity limitation, psychological distress and deaths due to falls. Rates of potentially avoidable deaths and deaths from coronary heart disease are higher in populations with low socioeconomic status.

Indigenous comparison

Where these comparisons are provided, rates for Indigenous Australians across all Tier 1 indicators compare unfavourably with those of non-Indigenous Australians. Life expectancy for Indigenous Australians is, on average, 17 years less than for non-Indigenous Australians. Infant mortality rates are around three times those of non-Indigenous infants and the incidence rates for heart attack and cancer (except for melanomas) for Indigenous Australians are also higher.

Rates of potentially avoidable deaths (explained further in Chapter 2) in the Indigenous population are almost four times those of other Australians. The death rates for National Health Priority Area diseases such as some cancers, falls, suicide and cardiovascular diseases are also higher in Indigenous populations.

Tier 2: Determinants of health

'Determinants of health' is a term used for factors that affect health at the individual or population level. As detailed in Chapter 4, they are the key to the prevention of disease and injury and help explain and predict trends and inequalities in health. They can be environmental, socioeconomic, behavioural and biomedical, and can act more directly to cause disease (such as tobacco smoking) or be further back in the causal chain and act via a number of intermediary causes (such as socioeconomic status). Individuals have a degree of control over some determinants (such as physical inactivity), but other determinants act mainly or entirely at a population level (such as the fluoridation of drinking water).

Tier 2 of the framework organises indicators of determinants of the health of Australians into five dimensions (see Table 9.4):

- *Environmental factors* are summarised with one indicator relating to local environments (smoking in the home) and another relating to the population-wide environment (availability of fluoridated water).
- *Socioeconomic factors* are summarised with an indicator of income inequality across the population.
- *Community capacity* is measured in terms of the level of informal care.
- *Health behaviours* are summarised using four indicators that relate to many chronic diseases and a measure that reflects several of the behaviours, namely overweight and obesity.
- *Person-related factors* are represented by indicators of low birthweight and high blood pressure, both risk factors for a range of health conditions.

Table 9.4 Determinants of health indicators

Indicator	Favourable trend	No trend	Unfavourable trend	Other
Environmental factors: Children exposed to tobacco smoke in the home	✓			
Environmental factors: Availability of fluoridated water				(a)
Socioeconomic factors: Income inequity		✓		
Community capacity: Informal care				(b)
Health behaviours: Adult smoking	✓			
Health behaviours: Risky alcohol consumption		✓		
Health behaviours: Fruit and vegetable intake				
Fruit intake		✓		
Vegetable intake				(a)
Health behaviours: Physical activity		✓		
Health behaviours: Overweight and obesity				
Overweight (but not obese)			✓	
Obesity			✓	
Person-related factors: Low birthweight babies		✓		
Person-related factors: High blood pressure				(a)

(a) Data unavailable or not comparable.
(b) Unclear which direction of change would be favourable or unfavourable.

Table 9.5: Determinants of health indicators: comparisons

Indicator	Domain and description	Previous and current rates	International comparison	Population variations	Indigenous comparison	Chapter, table or figure in *Australia's health 2008* or other sources
2.01 Children exposed to tobacco smoke in the home	**Environmental factors:** Proportion of households with dependent children (0–14 years) where adults report smoking inside	2001: 19.7% 2007: 7.8% (Any smoking inside)	n.a.	n.a.	Rate 1.5 times that for other Australians	Chapter 4, Table 4.13 AIHW 2007b
2.02 Availability of fluoridated water	**Environmental factors:** Proportion of the population served by a reticulated water supply that provides satisfactory fluoride levels whether artificially fluoridated or naturally occurring	2001: 69%	n.a.	Significant variation between states and territories due to differences in government policies	n.a.	Chapter 4, Box 4.1

(continued)

Table 9.5 (continued): Determinants of health indicators: comparisons

Indicator	Domain and description	Previous and current rates	International comparison	Population variations	Indigenous comparison	Chapter, table or figure in *Australia's health 2008* or other sources
2.03 Income inequity	**Socioeconomic factors:** Ratio of equivalised weekly incomes at the 80th percentile to the 20th percentile income	2000–01: 2.63 2005–06: 2.55	n.a.	n.a.	n.a.	Chapter 4, Table 4.9
2.04 Informal care	**Community capacity:** Percentage of population engaged in informal care	Per cent as primary carers Males 1998: 1.4% 2003: 1.7% Females 1998: 3.4% 2003: 4.3%	n.a.	n.a.	n.a.	Chapter 8, Table 8.29
2.05 Adult smoking	**Health behaviours:** Proportion of people aged 14 years and over who are daily smokers Proportion of people aged 18 years and over who are daily smokers	Aged 14 years and over 2001: 19.5% 2007: 16.6% Aged 18 years and over 2001: 24.0% 2007: 17.5%	Among the best OECD countries	Higher in males Higher in rural and remote areas Higher in disadvantaged areas	Rates double those of other Australians	Chapter 4, Figure 4.6
2.06 Risky alcohol consumption	**Health behaviours:** Proportion of the population aged 18 years and over at risk of long-term harm from alcohol	2001: 10.8% 2007: 13.4%	n.a.	Similar for males and females	Rates similar to those of other Australians	Chapter 4, Table 4.15 ABS 2006b
2.07 Fruit and vegetable intake	**Health behaviours:** Proportion of people eating sufficient daily serves of fruit and vegetables					
	Fruit consumption	*Males* 2001: 47% 2004–05: 48% *Females* 2001: 58% 2004–05: 60%	n.a.	Consumption improves with increasing age	Fruit consumption rate similar to that of other Australians	Chapter 4, Figure 4.11 ABS 2006b
	Vegetable consumption	*Males* 2004–05: 12% *Females* 2004–05: 16%	n.a.	Consumption improves with increasing age	Vegetable consumption rate similar to that of other Australians	Chapter 4, Figure 4.11 ABS 2006b

(continued)

Table 9.5 (continued): Determinants of health indicators: comparisons

Indicator	Domain and description	Previous and current rates	International comparison	Population variations	Indigenous comparison	Chapter, table or figure in *Australia's health 2008* or other sources
2.08 Physical activity	**Health behaviours:** Proportion of adults insufficiently physically active to obtain a health benefit	2000: 54% 2004: 50%	n.a.	Females are less active than males	Rates similar to those of other Australians	Chapter 4, Figure 4.9
2.09 Overweight and obesity	**Health behaviours:** Proportion of adults overweight or obese					
	Overweight (but not obese)	*Males* 2001: 42% 2004–05: 41% *Females* 2001: 25% 2004–05: 25%		Increases with age but declines after age 65 years Higher in disadvantaged areas	Rates lower than those of other Australians	Chapter 4, Figure 4.19
	Obesity	*Males* 2001: 16% 2004–05: 19% *Females* 2001: 17% 2004–05: 17%	Similar rates of obesity to Canada and the United Kingdom Better than the United States but worse than France and Japan	Increases with age but declines after age 65 years Higher in disadvantaged areas	Obesity rates twice those of other Australians	Chapter 4, Figure 4.19
2.10 Low birthweight babies	**Person-related factors:** Proportion of babies who are low birthweight	1999: 6.2% 2005: 6.4%	Similar to the OECD average	Higher for female babies	Rates more than twice those of babies of other Australian mothers	Chapter 6, Table 6.2 Laws et al. 2007
2.11 High blood pressure	**Person-related factors:** Proportion of persons aged 25 years and over with high blood pressure or on medication for high blood pressure	1999–2000: 30%	n.a.	Slightly higher for males Rates increase sharply with increasing age	Rates 1.6 times those of other Australians	Chapter 4, Figure 4.15

Current and previous rates

The 11 indicators in Tier 2 do not indicate an overall trend in the determinants of health in Australia since the 2003 report. A favourable trend has been occurring for the proportion of children exposed to cigarette smoke in the home (decreased from 19.7% in 2001 to 7.8% in 2007) and the proportion of smokers aged over 14 years in the population (decreased from 19.5% in 2001 to 16.6% in 2007). However, there is an unfavourable trend in overweight and obesity rates overall, although this is not readily seen in the period between 2001 and 2004–05. For two of the indicators, no new data were available, and for a number of other indicators no overall trend was able to be determined, even though the reported rates may have changed since the last report.

International comparison

Australia compares favourably with other OECD countries for one of three NHPC indicators of determinants where international data are available, ranking among the best of the OECD countries for tobacco smoking. However, rates of overweight and obese people in Australia are among the worst for OECD countries. Australia rates better than the United States of America, similar to Canada and the United Kingdom and worse than countries such as France and Japan.

The rate of low birthweight babies born in Australia is similar to the average OECD rate.

Population variations

For a number of health determinants, results for males were less favourable than for females. Participation in smoking is higher among males than females, and males are more likely to be overweight or obese and have high blood pressure. Consumption of fruit and vegetables is higher among females than males, with consumption increasing with age. However, females are less likely to be sufficiently physically active and are more likely to be of low birthweight. Females are more often engaged in informal care than males.

Smoking rates are higher in disadvantaged and rural and remote areas, with males smoking more than females. Rates of obesity also increase in areas of higher disadvantage.

Availability of fluoridated water varies between states and territories because of local government decisions.

Indigenous comparison

Levels of health determinants for Indigenous Australians, where available, are consistently less favourable than for other Australians. This is in keeping with the poorer health status of Indigenous Australians reflected in Tier 1 indicators. They are more likely to be exposed to tobacco smoking in the home as children and twice as likely to be adult smokers as non-Indigenous Australians are. They are also twice as likely to be obese, and rates of high blood pressure are higher in this population.

As illustrated in Tier 1, the rates of Indigenous infant mortality are around three times those of non-Indigenous infants, and the rate of babies born with low birthweight in Indigenous populations is more than twice as high.

Tier 3: Health system performance

The health-care system may be viewed as a combination of the various service categories and interventions of the health-care system. It incorporates population health, primary care, acute care and continuing care, and features considerable overlap of services and functions between them. This tier of indicators brings together performance reporting on the range of components of the health system to create a view of the system's performance as a whole. Some indicators relate to the desired outcomes of interventions in terms of health status or determinants of health. Others are measures of the process of the intervention, with the assumption that a high-quality process will produce a good health outcome.

The tier has nine dimensions against which the indicators are presented:

- *Effectiveness* focuses on whether there have been gains in health status or health determinants that suggest that interventions have been effective. It is assessed using nine indicators that cover aspects of population health, primary care, acute care and continuing care, and a range of acute and chronic health conditions.
- *Appropriateness* aims at whether interventions are undertaken according to 'best practice'. Four indicators cover aspects of primary and acute care.
- *Efficiency* of the system is assessed as the cost of service provision, represented by two indicators of the efficiency of acute care.
- *Responsiveness* is gauged by a measure of waiting times in emergency departments that can also be regarded as a measure of accessibility.
- *Accessibility* of care uses three indicators relevant to primary and acute care, relating to cost of care, geographical accessibility and waiting times.
- *Safe care* is assessed using a process indicator for safety in primary care, and an outcome indicator for acute care.
- *Continuous care* relates to how the sectors of the health-care system work together. It is measured using two indicators relating to the links between primary care and other care.
- *Capable care* is defined by the NHPC as the capacity to provide a health service based on skills and knowledge. It is indicated by a measure of accreditation in general practice.
- *Sustainability* of the health system is defined as capacity to provide infrastructure, such as workforce, facilities and equipment, and be innovative and respond to emerging needs. It is assessed using indicators relating to the health workforce.

The National Health Performance Framework does not include any single dimension identified as 'quality'. Instead, quality has been considered by the NHPC as an integral part of the health system performance tier. The NHPC notes that the dimensions considered in determining the quality of the system are very similar to those measuring health system performance, and that the overall performance of the system cannot be assessed through a single dimension. Thus, a system that is performing well could be defined as delivering interventions of a high quality, assessed using indicators relating to each of the Tier 3 dimensions.

Table 9.6: Health system performance indicators

Indicator	Favourable trend	No trend	Unfavourable trend	Other
Effective: Unsafe sharing of needles		✓		
Effective: Teenage purchase of cigarettes	✓			
Effective: Cervical screening		✓		
Effective: Breast cancer screening		✓		
Effective: Childhood immunisation		✓		
Effective: Influenza vaccination		✓		
Effective: Potentially preventable hospitalisations		✓		
Effective: Survival following acute coronary heart disease	✓			
Effective: Cancer survival	✓			
Appropriate: Appropriate use of antibiotics		✓		
Appropriate: Management of diabetes				(a)
Appropriate: Delivery by caesarean section				(b)
Appropriate: Hysterectomy rate				(b)
Efficient: Hospital costs				(a)
Efficient: Length of stay in hospital	✓			
Responsive: Waiting times in emergency departments		✓		
Accessible: Bulk-billing for non-referred (GP) attendances	✓			
Accessible: Availability of GP services		✓		
Accessible: Access to elective surgery			✓	
Safe: Electronic prescribing and clinical data in general practice	✓			
Safe: Adverse events treated in hospitals				(a)
Continuous: Enhanced primary care services	✓			
Continuous: Health assessments by GPs	✓			
Capable: Accreditation in general practice		✓		
Sustainable: Health workforce—graduates		✓		
Sustainable: Health workforce aged over 55 years			✓	

(a) Data unavailable or not comparable.

(b) Unclear which direction of change would be favourable or unfavourable.

Table 9.7: Health system performance indicators: comparisons

Indicator	Domain and description	Previous and current rates	Population variations	Indigenous comparison	Chapter, table or figure in *Australia's health 2008* or other sources
3.01 Unsafe sharing of needles	**Effective:** Percentage of injecting drug users, participating in surveys carried out at needle and syringe programs, who report recent sharing of needles and syringes	2001: 14% 2006: 13%	n.a.	n.a.	Chapter 4, Section 4.5, p145
3.02 Teenage purchase of cigarettes	**Effective:** Percentage of teenage smokers who personally purchased their most recent cigarette	*Aged 12–15 years* 1999: 21% 2005: 17% *Aged 16–17 years* 1999: 48% 2005: 29%	n.a.	n.a.	Chapter 4, Figure 4.7
3.03 Cervical screening	**Effective:** Cervical screening rates for women within national target groups	2000–2001: 63% 2004–2005: 61%	Highest among those aged 45–59 years Lowest among those under 30 years and aged 60 years and over Highest in Major Cities and lowest in Very Remote areas Lowest in disadvantaged areas	n.a.	Chapter 7, tables 7.3 and 7.4
3.04 Breast cancer screening	**Effective:** Breast cancer screening rates for women within the national target groups	1999–2000: 56.4% 2004–2005: 56.2%	Lower in Major Cities and Very Remote areas Higher in Inner Regional, Outer Regional and remote areas Lowest in disadvantaged areas	Lower rates than for other Australians	Chapter 7, Table 7.1 and Figure 7.2
3.05 Childhood immunisation	**Effective:** Number of children fully immunised at 12 months and 24 months	*Aged 12–15 months* 2002: 91.7% 2007: 91.2% *Aged 24–27 months* 2002: 89.4% 2007: 92.5%	Small variation between states and territories	Lower coverage for those aged 12–15 months	Chapter 4, Table 4.19
3.06 Influenza vaccination	**Effective:** Percentage of adults 65 years and over who received an influenza vaccination for the previous winter	2002: 77.0% 2006: 77.5%	Higher for females	Rates higher than for other Australians	Chapter 4, p154

(continued)

Table 9.7 (continued): Health system performance indicators: comparisons

Indicator	Domain and description	Previous and current rates	Population variations	Indigenous comparison	Chapter, table or figure in *Australia's health 2008* or other sources
3.07 Potentially preventable hospitalisations	**Effective:** Admissions to hospital that could have potentially been prevented through the provision of appropriate non-hospital health services	Per 1,000 2002: 30.5 2006: 32.0	Rates highest in Very Remote regions, falling with decreased remoteness	Rates 5 times as high as other Australians	Chapter 7, figures 7.18 and 7.19 AIHW 2007a AIHW 2007b
3.08 Survival following acute coronary heart disease	**Effective:** Deaths occurring after acute CHD events ('heart attacks')[(a)]	*Case fatality* 2001: 47% 2005: 40% *Survival* 2001: 53% 2005: 60%	Similar for males and females Case fatality rates increase markedly with age	Case fatality rates for Indigenous Australians are 1.8 times those of other Australians	Chapter 5, Figure 5.4 AIHW: Mathur 2002 AIHW: 2006a
3.09 Cancer survival	**Effective:** Five-year relative survival proportions for people diagnosed with cancer	*Males* 1992–1997: 54.8% 1998–2004: 58.4% *Females* 1992–1997: 60.8% 1998–2004: 64.1%	Survival declines steadily with increasing age	n.a.	Chapter 5, Table 5.1
3.10 Appropriate use of antibiotics	**Appropriate:** Number of prescriptions for oral antibiotics ordered by GPs for the treatment of upper respiratory tract infections (per 100 encounters)	2001–02: 33.1% 2006–07: 34.6%	n.a.	n.a.	Chapter 7, figures 7.7 and 7.8
3.11 Management of diabetes	**Appropriate:** Proportion of people with diabetes who have received an annual cycle of care within general practice	2002: 18.2	n.a.	n.a.	n.a.
3.12 Delivery by caesarean section	**Appropriate:** Caesarean sections as a proportion of all confinements by hospital status	2000: 23.1% 2005: 30.3%	Higher among older mothers Higher in private hospitals than public hospitals	Lower rates than among other mothers	Chapter 6, Table 6.1 Laws et al. 2006 Laws et al. 2007
3.13 Hysterectomy rate	**Appropriate:** Separation rates for hysterectomies	Per 1,000 females aged 15–69 years 2001–02: 4.55 2005–06: 3.74	Highest in outer regional areas and lowest in very remote regions	n.a.	Chapter 7, figures 7.27 and 7.28

(continued)

Table 9.7 (continued): Health system performance indicators: comparisons

Indicator	Domain and description	Previous and current rates	Population variations	Indigenous comparison	Chapter, table or figure in *Australia's health 2008* or other sources
3.14 Hospital costs	**Efficient:** Average cost per casemix-adjusted separation for public acute care hospitals	Current prices 2001–02: $3,004 2005–06: $3,698	Variation between states and territories —highest in ACT and lowest in SA (public hospitals)	n.a.	Chapter 7, Table 7.15 and Figure 7.24
3.15 Length of stay in hospital	**Efficient:** Relative stay index by medical, surgical and other DRGs	2001–02: 1.02 2005–06: 0.97	Higher for public compared with private hospitals Variation between states and territories — lowest in Vic and highest in NT	n.a.	Chapter 7, figures 7.33 and 7.34 AIHW 2007a
3.16 Waiting times in emergency departments	**Responsive:** Percentage of patients who are treated within national benchmarks for waiting in public hospital emergency departments for each triage category	Triage category 2001–02 *1* 99% *2* 76% *3* 60% *4* 59% *5* 84% 2005–06 *1* 100% *2* 77% *3* 64% *4* 65% *5* 87%	n.a.	n.a.	Chapter 7, figures 7.36, 7.37 and 7.38 AIHW 2007a
3.17 Bulk-billing for non-referred (GP) attendances	**Accessible:** Proportion of non-referred (GP) attendances that are bulk-billed (or direct billed) under the Medicare program	2002–03: 69.5% 2005–06: 75.6%	n.a.	n.a.	Chapter 7, Figure 7.3
3.18 Availability of GP services	**Accessible:** Availability of GP services on a full-time workload equivalent basis	2001–02: 16,736 2006–07: 18,091	Lower for rural and remote areas	n.a.	Chapter 7, figures 7.16 and 7.17 SCRGSP 2007
3.19 Access to elective surgery	**Accessible:** Median waiting time for access to elective surgery—from the date patients were added to the waiting list to the date they were admitted	2001–02: 27 days 2005–06: 32 days	n.a.	n.a.	Chapter 7, figures 7.30, 7.31 and 7.32
3.20 Electronic prescribing and clinical data in general practice	**Safe:** Percentage of general practices in the Practice Incentives Program who transfer clinical data electronically or use electronic prescribing software	*e-prescribing* 2003: 90.5% 2006: 94.4%, *electronic data transfer* 2003: 89.7% 2006: 93.1%	n.a.	n.a.	Chapter 7, figures 7.13 and 7.14

(continued)

Table 9.7 (continued): Health system performance indicators: comparisons

Indicator	Domain and description	Previous and current rates	Population variations	Indigenous comparison	Chapter, table or figure in *Australia's health 2008* or other sources
3.21 Adverse events treated in hospitals	**Safe:** Proportion of hospital separations where an adverse event treated and/or occurred	2001–02: 4.1% 2005–06: 4.8%	n.a.	n.a.	Chapter 7, Figure 7.29 and Table 7.16 AIHW 2007a
3.22 Enhanced primary care services	**Continuous:** Percentage of GPs using enhanced primary care items	2002–03: 41% 2006–07: 90%	Differences between states and territories — highest in NSW and Vic and lowest in NT and ACT	n.a.	Chapter 7, figures 7.9 and 7.10
3.23 Health assessments by GPs	**Continuous:** Percentage of eligible older people who have received an enhanced primary care annual voluntary health assessment	Eligible non-Indigenous population 2001–02: 16% 2005–06: 21% Eligible Indigenous population 2001–02: 5% 2005–06: 7%	Large variation between states and territories	Rates one-third those of other Australians	Chapter 7, Figure 7.11 SCRGSP 2007
3.24 Accreditation in general practice	**Capable:** Number of general practices accredited against the Royal Australian College of General Practitioners Standards for General Practices	2003: 77.7% 2005–06: 80%	n.a.	n.a.	Chapter 7, Figure 7.15
3.25 Health workforce Part 1	**Sustainable:** Graduates in pharmacy, medicine and nursing as a percentage of the total pharmacy, medical and nursing workforce	*Pharmacy* 1999: 4.4% *Medicine* 1999: 2.5% 2005: 2.4% *Nursing* 2000: 2.5% 2005: 3.0%	n.a.	n.a.	Chapter 8, Figure 8.14
3.25 Health workforce Part 2	**Sustainable:** Proportion of employed nurses, pharmacists, medical specialists and primary care practitioners aged 55 years and over (%)	*Pharmacy* 1999: 31.0% *Medical specialists* 1999: 31.2% 2005: 31.7% *Primary care practitioners* 1999: 25.1% 2005: 28.6% *Nursing* 2000: 10.0% 2005: 19.1%	n.a.	n.a.	Chapter 8, Figure 8.15

(a) The method for age-standardising case-fatality rates for heart attacks has changed since the NHPC (2004) report. The 2001 rate presented here has been recalculated using the new method.

Current and previous rates

The 25 indicators of health system performance provide a mixed picture, depicting a health system that has improved over recent years against some measures, but for which there are indications of stable or declining performance in many areas. Overall, eight of the indicators showed a favourable trend, whereas the trends for the indicator related to the health workforce aged over 55 years and access to elective surgery were unfavourable. Indicators showing improved performance were in the domains of effectiveness, accessibility, continuity and safety. However, data for most indicators in Tier 3 did not provide a clear picture of either improving or declining performance.

Effectiveness

A favourable trend was recorded for three of the nine indicators of effectiveness and for the remaining six there was no trend.

The proportion of teenage smokers aged 16–17 years who personally purchased their most recent cigarette shows a favourable decline over the long term and decreased from 48% to 29% between 1999 and 2005. Survival following a heart attack also shows a favourable long-term trend, reflected in the increase from 70% to 74% between 2001 and 2005. This increase is reflected by the fall in death rates for coronary heart disease and the fall in the incidence of heart attack described in Tier 1. Cancer survival rates were the third indicator of effectiveness to show a favourable trend, in contrast to the incidence rates for cancer described in Tier 1, which had increased unfavourably. There has been no long-term trend in the proportion of children fully immunised at 12 and 24 months, although these rates remain high, currently 91.2% and 92.5% respectively. Screening rates for cervical and breast cancer also showed no trend.

Other indicators of effectiveness showing no long-term trend in their levels include potentially preventable hospitalisations, unsafe sharing of needles, cervical screening, breast cancer screening and influenza vaccination.

Appropriateness

For two of the four measures of appropriateness (caesarean section and hysterectomy rates) the NHPC provided no indication as to whether rates should be higher or lower than that measured for its report. Thus it is not possible to comment on whether the increases noted in the level of these indicators since the previous measurement are unfavourable or not. No new data are available about the management of diabetes, and the level for the measure of appropriate use of antibiotics remained stable.

Efficiency

For the two efficiency indicators, results are mixed. The index for the length of stay in hospital was favourably lower in 2005–06 than in 2001–02. The cost per casemix-adjusted separation was $3,698 in 2005–06 compared with $3,004 in 2001–02 (current prices), suggesting an unfavourable change. However, these costs are not comparable because there is no agreed inflation adjustment factor for them. Applying the standard adjustment for public hospital expenditure, there would be a 6.3% increase in 2005–06 compared with 2001–02.

Responsiveness

Waiting times in emergency departments indicated that responsiveness to the requirements of patients presenting to emergency departments was stable. All patients requiring resuscitation (triage category 1) were seen immediately in 2005–06.

Accessibility

One of three measures of accessibility of medical services (bulk-billing for non-referred (GP) services under the Medicare program) indicated a favourable change in the level of the indicator. There was no trend able to be determined in the availability of GP services.

The median waiting time for elective surgery showed an unfavourable trend, increasing from 27 days in 2001–02 to 32 days in 2005–06.

Safety

Of the two indicators reflecting patient safety, only one shows a favourable change in the indicator level. The use of electronic prescribing in general practice shows a favourable trend, and from 2003 to 2006 increased from 90.5 to 94.4%. Comment cannot be made on the favourable or unfavourable nature of changes in the second indicator of patient safety, the proportion of hospital separations where an adverse event occurred or was treated. Fluctuations in the number of adverse events may reflect fluctuations in detecting and reporting them rather than actual changes in the number occurring.

Continuity

Both measures of continuity within the health-care system relate to enhanced primary care in the GP setting and show a favourable trend. The proportion of GPs using enhanced primary care MBS items rose from 41% to 90% between 2002–03 and 2006–07. The proportion of older people who had received an enhanced primary care annual voluntary health assessment rose between 2001–02 and 2005–06.

Capability

Capability is represented by one indicator, the level of accreditation in general practice. There is currently no trend for this indicator, but the percentage of accredited GP practices is high at 80%.

Sustainability

The sustainability of the health-care system is represented by two indicators, the number of new health graduates as a proportion of the total workforce and the proportion of the workforce aged 55 years and over. Viewed together these give an indication of whether the rates of entry of new graduates into the professions are adequate to replace those retiring. The level of indicator 3.25 part 2—health workforce over the age of 55—exhibits an unfavourable long-term trend, consistent with the change between 1999 and 2005. The proportion of graduates of medicine, nursing and pharmacy courses as a percentage of the total workforce shows no trend. This may indicate that the replacement rates are insufficient to keep up with attrition from retirement, and is probably reflected in the shortage of nurses in Australia. A decline in overall workforce numbers may also have some impact on other indicators within this tier, such as access to elective surgery.

Population variations

Population variation for Tier 3 indicators can be seen across states and territories, remoteness classifications, socioeconomic status, age, sex and the public and private hospital systems. Indicators that varied by state include hospital costs, length of stay in hospital, delivery by caesarean section, childhood immunisation rates and the use of enhanced primary care services.

Screening rates for breast and cervical cancer are lowest in females living in disadvantaged areas.

Cervical screening rates decreased with remoteness, but breast cancer screening was lowest in Major Cities and Very Remote areas and greater in Inner Regional, Outer Regional and Remote areas. Availability of GP services is also lower in rural areas. Potentially preventable hospitalisation rates were highest in Very Remote regions and fell with decreasing remoteness. Females in Outer Regional areas have the highest rates of hysterectomy, whereas those in Remote regions have the lowest rates.

Rates of delivery by caesarean section and length of stay vary between public and private hospitals, with caesarean rates higher in the private hospital sector and longer stays occurring in public hospitals.

Indigenous comparison

Information on Tier 3 indicators for Indigenous Australians and other populations was available only for a small number of indicators, some of those in the effectiveness group and one each for the continuity and appropriateness dimensions.

For indicators of effectiveness, Indigenous populations had lower rates of breast cancer screening and vaccine coverage at 1 year of age and higher rates of death following acute coronary heart disease. This was reflected in the higher death rates from cardiovascular disease in the Indigenous population described in Tier 1. Indigenous Australians are more than 5 times as likely as other Australians to have a hospitalisation that was potentially preventable through the provision of effective non-hospital health services.

Indigenous comparison data are available for one indicator of continuity in Tier 3 and this shows that the rate of enhanced primary care annual voluntary health assessments by GPs for eligible Indigenous peoples is one-third that of other Australians.

Indicators of appropriateness show Indigenous females are less likely to have a caesarean section than non-Indigenous females.

9.3 Conclusion

The overview that emerges shows that health status is steady or improving and few of its indicators show unfavourable trends. Mortality especially is reducing and the levels of certain illnesses and diseases have reduced. Determinants of health show a more mixed picture with smoking-related indicators having improved levels, but rates of overweight and obesity increasing.

Some of the improvement may have been driven by the preventive and treatment activities of the health system, but health improvements are due to the combined impact of many different influences in society, and it is not possible to estimate the contribution of the health system alone.

Australian levels of health compare favourably with those of other OECD countries in the majority of indicators for which OECD comparisons are available; however, improvements in rankings could be an aim in certain areas, particularly for the incidence of cancer and for the rates of obesity and overweight, which are significant determinants for many chronic diseases.

The indicators also show that there are still significant health inequalities in Australia. These are most clearly seen in the indicator results for Indigenous Australians in all three tiers. This is despite the considerable uncertainty around the data for Aboriginal and Torres Strait Islander persons, mostly because of under-identification of Indigenous people in a number of data sets.

Inequalities between high and low socioeconomic groups and urban and rural populations can also be seen across all tiers. This probably reflects the impact that the broader determinants of health have on health outcomes.

Finally, despite the evidence of generally improving health, the picture is much less clear in relation to the 25 indicators in Tier 3 that aim at capturing the health system's performance. The question remains whether this is a fair reflection of Australia's health system or just a result of the short period used here to analyse trends and also of the nature, number and scope of the indicators used. The NHPC set was chosen to be manageable in size and comprehensive in scope, but this is a difficult combination to achieve.

References

ABS (Australian Bureau of Statistics) 2006a. Deaths, Australia, 2005. ABS cat. no. 3302.0. Canberra: ABS.

ABS 2006b. National health survey summary of results, 2004–05. ABS cat. no. 4364.0. Canberra: ABS.

ABS & AIHW (Australian Institute of Health and Welfare) 2005. The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples 2005. ABS cat. no. 4704.0. AIHW cat. no. IHW 14. Canberra: ABS & AIHW.

AIHW (Australian Institute of Health and Welfare) 2004: Heart, stroke and vascular diseases—Australian facts 2004. Cat. no. CVD 27. Canberra: AIHW and National Heart Foundation of Australia (Cardiovascular disease series no. 22).

AIHW 2005a. Australia's welfare 2005. Cat. no. AUS 65. Canberra: AIHW.

AIHW: Mathur S 2002. Epidemic of coronary heart disease and its treatment in Australia. Cardiovascular disease series no. 20. Cat. no. CVD 21. Canberra: AIHW.

AIHW 2006a: Mathur S, Moon L, Leigh S 2006. Aboriginal and Torres Strait Islander people with coronary heart disease: further perspectives on health status and treatment. Cardiovascular diseases series no. 25. Cat. no. CVD 33. Canberra: Australian Institute of Health and Welfare.

AIHW 2006b. Australia's health 2006. Cat. no. AUS 73. Canberra: AIHW.

AIHW 2007a. Australian hospital statistics 2005–06. Health services series no. 30. Cat. no. HSE 50. Canberra: AIHW.

AIHW 2007b. Aboriginal and Torres Strait Islander Health Performance Framework, 2006 report: detailed analyses. Cat. no. IHW 20. Canberra: AIHW.

AIHW & AACR (Australasian Association of Cancer Registries) 2007. Cancer in Australia: an overview, 2006. Cancer series no. 37. Cat. no. CAN 32. Canberra: AIHW.

AIHW & AACR (forthcoming) 2008. Cancer in Australia: an overview, 2008 Cardiovascular diseases series no. 25. Cat. no. CVD 33. Canberra: AIHW.

Laws PJ, Abeywardana S, Walker J & Sullivan EJ 2007. Australia's mothers and babies 2005. Perinatal statistics series no. 20. AIHW Cat. no. PER 40. Sydney: AIHW National Perinatal Statistics Unit.

Laws PJ, Grayson N & Sullivan EA 2006. Australia's mothers and babies 2004. Perinatal statistics series no. 18. AIHW cat. no. PER 34. Sydney: AIHW National Perinatal Statistics Unit.

NHPC (National Health Performance Committee) 2001. National Health Performance Framework report. Brisbane: Queensland Health.

NHPC 2004. National report on health sector performance indicators 2003. Cat. no. HWI 78. AIHW: Canberra.

OECD (Organisation for Economic Co-operation and Development) Health Data 2007: comparative analysis of 30 countries. Paris: OECD <www.oecd.org>.

Page A, Tobias M, Glover J, Wright C, Hetzel D & Fisher E 2006. Australian and New Zealand atlas of avoidable mortality. Adelaide: Public Health Information Development Unit, University of Adelaide.

SCRGSP (Steering Committee for the Review of Government Service Provision) 2007, Report on government services 2007. Canberra: Productivity Commission.

WHO (World Health Organization) 2007. WHO statistical information system. Life tables for WHO member states. Geneva: WHO. Viewed 15 August 2007, <www.who.int/whosis/en>.

Statistical tables

Population

Table S1: Estimated resident population, selected years, 1901 to 2006

Age group (years)	1901	1921	1941	1961	1981	2001	2006[(a)]
Males							
0–4	172,957	307,300	299,900	573,700	583,218	657,499	672,183
5–14	450,067	570,800	575,300	1,056,600	1,321,340	1,386,873	1,406,615
15–24	366,146	457,900	627,900	776,100	1,320,618	1,351,444	1,474,193
25–34	320,455	451,800	593,900	728,000	1,244,663	1,427,829	1,451,762
35–44	279,558	369,500	496,000	737,900	931,360	1,475,870	1,522,122
45–54	156,674	281,300	432,400	627,800	772,879	1,327,595	1,420,169
55–64	99,170	208,400	307,600	427,800	661,984	926,870	1,132,795
65–74	64,716	90,900	173,100	266,300	426,174	639,144	688,004
75–84	18,731	29,300	70,900	102,300	158,247	355,606	418,158
85+	2,207	4,700	7,500	15,800	27,784	81,922	104,337
All ages	**1,977,928**	**2,771,900**	**3,584,500**	**5,312,300**	**7,448,267**	**9,630,652**	**10,290,338**
Females							
0–4	168,836	296,300	288,700	546,400	556,400	624,858	636,468
5–14	441,003	557,300	556,000	1,008,300	1,264,582	1,317,968	1,334,877
15–24	365,792	462,800	614,900	729,300	1,278,293	1,303,713	1,409,905
25–34	293,424	458,400	573,300	664,400	1,212,261	1,445,867	1,447,857
35–44	216,135	353,200	471,900	706,100	891,517	1,495,591	1,540,018
45–54	118,574	257,400	436,400	595,700	737,394	1,331,776	1,438,799
55–64	80,302	179,300	307,600	435,500	691,752	903,953	1,126,611
65–74	48,935	82,000	186,400	333,100	511,502	681,749	720,303
75–84	14,757	31,000	79,700	149,200	256,487	493,800	538,658
85+	2,038	5,500	10,500	27,900	74,805	183,313	217,654
All ages	**1,795,873**	**2,683,200**	**3,525,400**	**5,195,900**	**7,474,993**	**9,782,588**	**10,411,150**

(a) Preliminary data.

Note: Population estimates are for 30 June of each year.

Source: AIHW population database.

Fertility and pregnancy

Table S2: Age-specific fertility rates[(a)] and total fertility rates[(b)], 1921 to 2006 (live births per 1,000 females)

	Age group of mother (years)							Total fertility rate
	Less than 20	20–24	25–29	30–34	35–39	40–44	45 and over	
Annual averages								
1921–1925	27.3	133.7	167.0	137.0	96.9	40.4	4.2	3,032
1941–1945	23.9	126.9	152.8	114.3	66.3	21.1	1.7	2,535
1961–1965	46.5	204.0	207.2	122.4	59.2	17.5	1.2	3,289
1981–1985	25.7	100.8	144.5	82.0	25.4	4.4	0.3	1,915
1991–1995	21.2	71.6	128.3	104.2	39.3	6.4	0.3	1,857
2001–2005	16.6	54.6	103.0	112.4	54.5	10.0	0.5	1,756
Annual rates								
2002	17.2	56.3	104.5	111.2	52.1	9.7	0.4	1,755
2003	16.1	54.2	102.4	112.2	54.2	10.0	0.5	1,747
2004	16.0	52.7	101.7	113.9	57.2	10.5	0.5	1,761
2005	15.8	51.9	101.8	116.8	60.2	10.8	0.5	1,789
2006	15.4	51.6	100.8	120.1	63.3	11.3	0.6	1,814

(a) Age-specific fertility rates are the live births registered during the calendar year, according to age of mother, per 1,000 of the female resident population of the same age as estimated for 30 June.

(b) Total fertility rate is obtained by summing the 5-year age-specific fertility rates and multiplying by 5. It represents the number of children 1,000 women would bear during their lifetimes if they experienced the rates of the year shown.

Source: ABS cat. no. 3301.0.

Table S3: Age-specific fertility rates[(a)] and total fertility rates[(b)], states and territories, 2006 (live births per 1,000 females)

	Age group of mother (years)							Total fertility rate
State/territory	Less than 20	20–24	25–29	30–34	35–39	40–44	45 and over	
NSW	13.2	49.9	100.1	120.0	64.7	11.9	0.6	1,800
Vic	9.7	38.9	91.0	126.9	69.7	12.8	0.6	1,745
Qld	19.7	61.3	107.3	112.3	55.3	9.3	0.6	1,831
WA	19.6	60.2	109.3	123.4	63.7	10.9	0.6	1,941
SA	16.7	53.8	105.0	114.4	57.5	8.9	0.4	1,788
Tas	26.6	81.7	127.3	121.8	55.7	9.1	0.3	2,123
ACT	9.1	32.6	87.4	124.6	69.3	13.4	0.6	1,684
NT	63.6	97.7	106.0	103.3	54.9	10.9	0.4	2,187
Australia	**15.4**	**51.6**	**100.8**	**120.1**	**63.3**	**11.3**	**0.6**	**1,814**

(a) Age-specific fertility rates are the live births registered during the calendar year, according to age of mother, per 1,000 of the female resident population of the same age as estimated for 30 June.

(b) Total fertility rate is obtained by summing the 5-year age-specific fertility rates and multiplying by 5. It represents the number of children 1,000 women would bear during their lifetimes if they experienced the rates of the year shown.

Source: ABS cat. no. 3301.0.

Table S4: Total fertility rates[(a)], crude birth rates[(b)] and male:female birth ratio, OECD countries, latest available year

	Total fertility rate		Crude birth rate		M:F birth ratio	
Country	**Year**	**Rate**	**Year**	**Rate**	**Year**	**Rate**
Australia	**2005**	**1.81**	**2005**	**12.8**	**2002**	**105.1**
Austria	2005	1.41	2005	9.5	2002	104.8
Belgium	2005	1.72	2005	11.2	1997	104.7
Canada	2005	1.53	2004	10.5	2000	105.6
Czech Republic	2005	1.28	2005	10.0	2002	105.9
Denmark	2005	1.80	2005	11.9	1999	104.8
Finland	2005	1.80	2005	10.9	2002	105.8
France	2005	1.94	2005	12.7	2000	105.3
Germany	2005	1.34	2005	8.3	2001	105.8
Greece	2005	1.28	2005	9.7	2001	107.0
Hungary	2005	1.32	2005	9.7	2002	105.5
Iceland	2005	2.05	2005	14.5	2001	105.1
Ireland	2005	1.88	2005	14.8	2001	105.9
Italy	2005	1.34	2005	9.5	2001	105.8
Japan	2005	1.26	2005	8.4	2002	105.7
Korea, Republic of	2005	1.08	2004	9.9	2002	110.0
Luxembourg	2005	1.70	2005	11.8	2002	105.5
Mexico	2005	2.20	2001	26.7	2001	105.0
Netherlands	2005	1.73	2005	11.5	2003	105.6
New Zealand	2005	2.00	2005	14.1	2000	106.0
Norway	2005	1.84	2005	12.3	2001	105.0
Poland	2005	1.24	2005	9.5	2002	106.1
Portugal	2005	1.40	2005	10.4	2002	107.7
Slovak Republic	2005	1.25	2005	10.1	2000	104.8
Spain	2005	1.34	2005	10.7	2001	105.7
Sweden	2005	1.77	2005	11.2	2001	106.3
Switzerland	2005	1.42	2005	9.8	2000	106.2
Turkey	2005	2.19	2005	18.9	n.a.	n.a.
United Kingdom	2005	1.80	2005	12.0	2002	105.4
United States	2005	2.05	2005	14.0	2000	104.8

(a) Total fertility rate is obtained by summing the 5-year age-specific fertility rates and multiplying by 5. It represents the number of children a woman would bear during her lifetime if she experienced the rates of the year shown.

(b) Live births per 1,000 mid-year population.

Sources: ABS cat. no. 3301.0; OECD 2007.

Table S5: Infant mortality rates, states and territories, selected years 1901 to 2006 (per 1,000 live births)

Year	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
1901	103.7	102.9	101.9	128.9	100.1	89.0	. .	62.5	103.6
1921	62.6	72.5	54.2	78.3	65.5	78.0	74.1	63.3	65.7
1941	43.8	36.2	39.1	35.3	32.5	49.0	16.4	83.3	39.7
1961	20.8	17.8	20.0	19.7	20.0	16.8	15.6	23.9	19.5
1981	10.2	9.3	10.4	8.9	8.0	12.3	8.9	23.5	10.0
1991	7.2	6.5	7.6	7.2	5.5	9.0	7.6	14.2	7.1
2001	5.3	4.8	5.9	5.1	4.6	6.2	3.0	10.7	5.3
2003	4.6	5.1	4.8	4.1	3.7	7.0	5.8	8.4	4.8
2004	4.6	4.5	5.2	3.9	3.2	3.6	6.9	10.7	4.7
2005	4.9	5.1	5.1	4.6	5.1	3.5	5.5	9.6	5.0
2006	4.9	4.3	5.3	4.9	3.2	3.9	5.1	8.9	4.7

Source: ABS cat. no. 3302.0.

Table S6: Perinatal mortality rates[(a)], by age group of mother, 1991, 2001 and 2003 to 2005 (per 1,000 live births plus fetal deaths)

	Age group of mother (years)						
Year	Less than 20	20–24	25–29	30–34	35–39	40 and over	Aust
1991	15.2	11.0	9.0	10.3	11.3	20.8	10.6
2001	15.7	8.9	7.4	7.0	9.2	11.6	8.4
2003	14.5	9.6	7.5	6.9	6.9	11.4	8.0
2004	17.6	9.0	7.3	6.8	7.2	11.1	8.0
2005	17.7	10.3	7.5	6.8	8.0	12.5	8.5

(a) Perinatal deaths consist of fetal deaths (stillbirths) and neonatal deaths (within 28 days of birth). The perinatal mortality rate is defined as the number of deaths per 1,000 live births and fetal deaths combined.

Note: Data are based on year of registration and use the ABS definition for perinatal deaths of at least 400 grams birthweight or, where birthweight is unknown, at least 20 weeks gestation. Editions of *Australia's health* before the year 2000 used the WHO definition of 500 grams birthweight and 22 weeks gestation.

Source: ABS cat. no. 3303.0.

Table S7: Perinatal mortality rates[(a)], states and territories, 1991, 2001 and 2003 to 2005 (per 1,000 live births plus fetal deaths)

Year	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
1991	11.0	9.8	11.1	10.3	9.0	11.9	12.5	18.2	10.6
2001	7.8	8.7	9.7	7.9	8.5	5.6	8.3	12.2	8.4
2003	6.8	8.8	7.8	8.2	8.3	11.9	9.4	15.2	8.0
2004	7.2	9.2	8.4	7.4	6.9	6.9	11.0	11.2	8.0
2005	7.4	9.9	8.8	7.7	7.3	8.5	10.4	14.6	8.5

(a) Perinatal deaths consist of fetal deaths (stillbirths) and neonatal deaths (within 28 days of birth). The perinatal mortality rate is defined as the number of deaths per 1,000 live births and fetal deaths combined.

Note: Data are based on year of registration and use the ABS definition for perinatal deaths of at least 400 grams birthweight or, where birthweight is unknown, at least 20 weeks gestation. Editions of *Australia's health* before the year 2000 used the WHO definition of 500 grams birthweight and 22 weeks gestation.

Source: ABS cat. no. 3303.0.

Table S8: Neonatal and infant mortality rates[a], and maternal mortality rate[b], OECD countries, latest available year

Country	Neonatal		Infant		Maternal	
	Year	Rate	Year	Rate	Year	Rate
Australia	**2005**	**3.6**	**2005**	**5.0**	**2005**	**3.5**
Austria	2005	3.0	2005	4.2	2005	3.8
Belgium	2005	2.3	2005	3.7	2004	2.5
Canada	2004	4.0	2004	5.3	2004	5.9
Czech Republic	2003	2.4	2005	3.4	2005	2.9
Denmark	2003	3.2	2005	4.4	2005	7.7
Finland	2003	2.1	2005	3.0	2003	3.5
France	2004	2.6	2005	3.6	2003	7.4
Germany	2003	2.7	2005	3.9	2005	4.1
Greece	2005	2.6	2005	3.8	2004	2.8
Hungary	2005	4.1	2005	6.2	2005	5.1
Iceland	2005	1.6	2005	2.3	2005	—
Ireland	2005	2.9	2005	4.0	2005	3.3
Italy	2003	3.0	2005	4.7	2002	3.4
Japan	2005	1.4	2005	2.8	2005	5.8
Korea	2002	3.3	2002	5.3	2003	15.0
Luxembourg	2003	2.6	2005	2.6	2004	18.3
Mexico	2005	11.7	2005	18.8	2005	63.4
Netherlands	2005	3.7	2005	4.9	2005	8.5
New Zealand	2005	3.2	2005	5.1	2002	14.7
Norway	2005	2.1	2005	3.1	2004	—
Poland	2005	4.5	2005	6.4	2005	3.0
Portugal	2004	2.6	2005	3.5	2004	8.2
Slovak Republic	2005	4.1	2005	7.2	2005	3.7
Spain	2002	2.8	2005	4.1	2003	4.5
Sweden	2005	2.1	2005	2.4	2004	2.0
Switzerland	2003	3.3	2005	4.2	2003	5.6
Turkey	2003	17.0	2006	22.6	2005	28.5
United Kingdom	2004	3.5	2005	5.1	2005	5.7
United States	2004	4.5	2004	6.8	2004	13.1

(a) Neonatal: less than 28 days. Infant: Less than 1 year. Deaths per 1,000 live births.

(b) Maternal deaths (ICD-10 codes O00–O99) per 100,000 live births.

Source: OECD 2007.

Mortality

Table S9: Life expectancy (years) at selected ages, 1901–1910 to 2004–2006

	At birth		At age 25		At age 65	
Year	**Males**	**Females**	**Males**	**Females**	**Males**	**Females**
1901–1910	55.2	58.8	40.6	43.4	11.3	12.9
1920–1922	59.2	63.3	42.7	45.7	12.0	13.6
1946–1948	66.1	70.6	45.0	48.7	12.3	14.4
1960–1962	67.9	74.2	45.8	51.3	12.5	15.7
1980–1982	71.2	78.3	48.2	54.5	13.8	18.0
1990–1992	74.3	80.4	50.8	56.4	15.4	19.3
2000–2002	77.4	82.6	53.5	58.3	17.4	20.8
2002–2004	78.1	83.0	54.1	58.7	17.8	21.1
2003–2005	78.5	83.3	54.5	59.0	18.1	21.4
2004–2006	78.7	83.5	54.7	59.2	18.3	21.5

Source: AIHW population database.

Table S10: Life expectancy (years) at selected ages, states and territories, 2004–2006

	At birth		At age 25		At age 65	
State/territory	**Males**	**Females**	**Males**	**Females**	**Males**	**Females**
New South Wales	78.6	83.4	54.6	59.1	18.1	21.4
Victoria	79.3	83.7	55.2	59.4	18.5	21.6
Queensland	78.5	83.4	54.6	59.2	18.3	21.5
Western Australia	79.1	83.8	55.1	59.6	18.6	21.9
South Australia	78.6	83.6	54.5	59.3	18.3	21.6
Tasmania	77.4	82.3	53.5	57.9	17.4	20.6
Australian Capital Territory	80.0	83.9	55.9	59.8	18.9	21.7
Northern Territory	72.1	78.1	49.2	54.6	16.3	19.0
Australia	**78.7**	**83.5**	**54.7**	**59.2**	**18.3**	**21.5**

Source: ABS cat. no. 3302.0.

Table S11: Life expectancy (years) at selected ages, OECD countries, 2005

	At birth		At age 25–29		At age 65–69	
Country	**Males**	**Females**	**Males**	**Females**	**Males**	**Females**
Australia	**79.0**	**83.7**	**55.0**	**59.4**	**18.6**	**21.7**
Austria	76.7	82.2	52.6	57.9	17.0	20.4
Belgium	75.6	81.5	51.5	57.1	16.2	20.0
Canada	78.0	82.7	54.0	58.4	17.8	21.1
Czech Republic	72.9	79.3	48.8	54.8	14.5	17.8
Denmark	75.6	80.4	51.4	56.0	16.0	19.1
Finland	75.7	82.4	51.5	58.0	16.8	20.7
France	76.8	83.9	52.6	59.5	17.7	22.2
Germany	76.5	82.0	52.2	57.6	16.6	20.1
Greece	76.9	82.1	53.0	57.8	17.3	19.8
Hungary	68.6	77.1	44.7	52.8	13.3	17.1
Iceland	79.2	82.8	54.8	58.2	18.0	20.6
Ireland	76.9	81.3	52.8	57.0	16.5	19.6
Italy	77.9	83.8	53.8	59.3	17.4	21.5
Japan	78.7	85.5	54.4	61.0	18.3	23.2
Korea, Republic of	75.1	81.8	51.0	57.5	15.8	19.8
Luxembourg	75.8	82.1	51.8	57.6	16.4	20.1
Mexico	71.8	76.9	49.9	54.2	16.1	18.2
Netherlands	76.9	81.3	52.7	56.9	16.3	19.8
New Zealand	77.5	81.9	53.6	57.7	17.3	20.6
Norway	77.5	82.4	53.3	58.1	17.0	20.6
Poland	70.8	79.3	46.9	55.1	14.3	18.5
Portugal	74.9	81.5	50.8	57.1	16.3	19.7
Slovak Republic	70.1	78.0	46.3	53.9	13.3	17.1
Spain	76.9	83.6	52.8	59.2	17.3	21.3
Sweden	78.7	83.0	54.5	58.4	17.7	20.8
Switzerland	78.7	83.8	54.6	59.4	18.1	21.6
Turkey	69.0	73.6	47.2	51.3	13.4	15.7
United Kingdom	76.6	81.1	52.6	56.8	16.7	19.6
United States	75.3	80.4	51.7	56.3	17.1	19.9

Note: WHO life expectancy values are based on abridged life tables for a single year, whereas ABS values are based on 3-year averages. The life expectancy values for Australia are thus slightly higher than those shown in previous tables, where ABS values are used.

Source: WHO 2007.

Table S12: Age-specific, crude and age-standardised death rates, all causes, by sex, selected years, 1921 to 2005 (per 100,000 population)

Sex/age group (years)	1921	1941	1961	1981	1991	2001	2005
Males							
0–4	2,213	1,289	564	281	191	137	132
5–9	200	139	49	34	20	14	13
10–14	172	108	52	29	22	16	11
15–19	219	159	123	124	88	66	49
20–24	321	205	161	153	128	101	84
25–29	373	199	146	133	127	108	93
30–34	442	232	169	123	133	121	108
35–39	584	339	229	165	161	137	122
40–44	730	461	380	261	198	172	171
45–49	994	737	588	455	313	251	242
50–54	1,299	1,161	992	790	517	361	354
55–59	1,895	1,775	1,614	1,294	885	631	541
60–64	2,878	2,774	2,619	1,983	1,543	1,034	873
65–69	4,199	4,251	4,117	3,231	2,489	1,712	1,464
70–74	6,199	6,479	6,252	5,195	3,927	2,907	2,404
75–79	10,076	10,054	9,312	8,018	6,547	4,875	4,204
80–84	15,368	15,264	14,084	12,112	10,548	8,041	7,256
85+	26,213	29,453	23,772	20,814	17,571	16,040	14,583
Crude rate	**1,106**	**1,099**	**946**	**815**	**744**	**694**	**664**
Age-standardised rate[(a)]	**1,987**	**1,853**	**1,600**	**1,318**	**1,056**	**824**	**728**
Females							
0–4	1,771	1,022	443	216	151	107	113
5–9	192	103	38	18	14	10	9
10–14	128	73	30	20	15	10	9
15–19	205	104	47	45	37	24	22
20–24	290	155	61	48	45	36	29
25–29	377	202	74	51	54	36	33
30–34	426	234	92	57	54	48	43
35–39	535	311	146	87	77	70	63
40–44	563	374	209	143	111	106	97
45–49	690	565	347	265	187	150	143
50–54	943	780	542	378	307	237	214
55–59	1,289	1,103	785	617	484	381	317
60–64	1,915	1,805	1,298	971	797	569	534
65–69	3,112	2,884	2,178	1,568	1,305	952	830
70–74	5,041	4,789	3,652	2,552	2,187	1,683	1,416
75–79	8,295	8,275	6,271	4,426	3,797	2,844	2,517
80–84	13,136	12,704	10,241	7,597	6,487	5,290	4,838
85+	22,345	25,457	20,670	16,035	14,351	13,045	12,538
Crude rate	**873**	**901**	**745**	**646**	**635**	**631**	**621**
Age-standardised rate[(a)]	**1,602**	**1,452**	**1,058**	**772**	**658**	**535**	**490**

(a) Age-standardised to the total Australian population at 30 June 2001.

Source: AIHW General Record of Incidence of Mortality (GRIM) Books.

Table S13: Age-specific, crude and age-standardised death rates, all causes, by state and territory of usual residence, 2005 (per 100,000 population)

Sex/age group (years)	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Males									
0–4	134	127	130	113	144	129	125	279	132
5–9	13	14	14	16	6	—	19	—	13
10–14	12	10	13	10	12	17	9	12	11
15–19	38	46	52	57	68	29	67	193	49
20–24	72	83	72	101	103	157	82	223	84
25–29	80	96	93	89	127	82	140	193	93
30–34	100	92	109	95	154	151	125	393	108
35–39	114	98	137	119	145	178	75	452	122
40–44	165	148	169	164	243	202	190	388	171
45–49	246	211	246	228	269	300	183	651	242
50–54	354	337	330	366	401	393	264	781	354
55–59	516	507	554	538	618	628	505	1,224	541
60–64	905	814	866	839	934	991	638	1,346	873
65–69	1,478	1,354	1,490	1,455	1,572	1,751	1,162	2,483	1,464
70–74	2,440	2,407	2,379	2,163	2,426	2,804	1,868	4,248	2,404
75–79	4,328	4,041	4,163	4,231	4,153	4,557	3,688	5,347	4,204
80–84	7,129	7,319	7,153	6,985	7,747	8,209	7,304	7,286	7,256
85+	14,459	14,687	14,209	14,671	15,353	15,586	13,753	10,676	14,583
Crude rate	**684**	**659**	**622**	**592**	**808**	**806**	**461**	**582**	**664**
Age-standardised rate[(a)]	**725**	**710**	**720**	**714**	**778**	**819**	**657**	**1,014**	**728**
Females									
0–4	106	113	111	130	107	55	152	257	113
5–9	10	7	10	8	7	13	—	50	9
10–14	6	12	9	9	8	12	—	50	9
15–19	20	23	20	23	24	24	43	57	22
20–24	26	25	30	32	34	40	37	94	29
25–29	29	27	34	48	29	37	24	110	33
30–34	39	39	46	45	51	32	47	156	43
35–39	55	63	60	66	69	115	41	235	63
40–44	89	85	101	98	107	108	104	411	97
45–49	139	134	136	143	168	191	137	366	143
50–54	206	221	205	188	237	279	207	501	215
55–59	317	314	337	259	317	363	243	707	317
60–64	560	509	513	479	569	719	444	600	534
65–69	815	812	921	774	754	981	815	1,088	830
70–74	1,443	1,383	1,413	1,296	1,427	1,672	1,470	1,976	1,416
75–79	2,536	2,500	2,579	2,226	2,467	3,123	2,288	4,033	2,517
80–84	4,769	4,876	4,899	4,736	4,748	5,469	5,252	4,752	4,838
85+	12,368	12,673	12,460	12,273	12,802	14,002	12,556	11,275	12,539
Crude rate	**642**	**639**	**564**	**531**	**746**	**781**	**454**	**369**	**621**
Age-standardised rate[(a)]	**485**	**487**	**494**	**467**	**495**	**571**	**486**	**671**	**490**

(a) Age-standardised to the total Australian population at 30 June 2001.

Source: AIHW General Record of Incidence of Mortality (GRIM) Books.

Table S14: Age-specific, crude and age-standardised death rates, OECD countries, latest year (per 100,000 population)

	Age group (years)					
Country (year)	**0[(a)]**	**1–4**	**5–14**	**15–24**	**25–34**	**35–44**
Males						
Australia (2005)	**535**	**26**	**12**	**66**	**101**	**146**
Australia (2001)	**595**	**27**	**15**	**84**	**112**	**153**
Austria (2002)	471	24	13	84	94	172
Belgium (1997)	602	29	17	91	120	215
Canada (2000)	585	23	16	78	89	157
Czech Republic (2002)	453	33	18	84	109	234
Denmark (1999)	487	25	20	81	114	217
Finland (2002)	305	21	14	88	119	229
France (2000)	499	27	17	85	120	243
Germany (2001)	481	28	14	71	83	181
Greece (2001)	590	19	19	101	115	166
Hungary (2002)	728	40	24	76	131	501
Iceland (2001)	239	34	23	105	88	118
Ireland (2001)	632	40	15	97	124	171
Italy (2001)	502	23	15	77	98	151
Japan (2002)	321	29	13	52	73	143
Korea (2002)	547	46	23	56	98	251
Luxembourg (2002)	364	43	51	91	170	233
Mexico (2001)	1,711	78	37	120	208	344
Netherlands (2003)	546	27	18	47	68	133
New Zealand (2000)	724	46	23	102	134	160
Norway (2001)	444	27	11	98	109	166
Poland (2002)	818	35	23	96	154	365
Portugal (2002)	541	45	26	99	173	320
Slovak Republic (2000)	992	48	26	84	147	331
Spain (2001)	442	29	17	74	110	208
Sweden (2001)	403	19	10	61	73	132
Switzerland (2000)	530	27	17	78	101	148
Turkey	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
United Kingdom (2002)	592	26	14	67	101	165
United States (2000)	757	36	21	115	139	255

(continued)

Australia's health 2008

Table S14 (continued): Age-specific, crude and age-standardised death rates, OECD countries, latest year (per 100,000 population)

	Age group (years)					
Country (year)	**45–54**	**55–64**	**65–74**	**75+**	**Crude rate**	**ASR[(b)]**
Males						
Australia (2005)	**294**	**688**	**1,900**	**7,339**	**663**	**390**
Australia (2001)	**305**	**810**	**2,272**	**7,917**	**694**	**438**
Austria (2002)	472	1,089	2,740	9,274	902	526
Belgium (1997)	498	1,187	3,221	10,845	1,044	606
Canada (2000)	353	965	2,603	8,567	733	481
Czech Republic (2002)	702	1,658	4,029	11,114	1,095	709
Denmark (1999)	521	1,270	3,461	10,447	1,085	615
Finland (2002)	537	1,120	2,924	9,670	944	559
France (2000)	569	1,156	2,682	8,761	951	543
Germany (2001)	479	1,188	2,888	9,317	955	541
Greece (2001)	433	993	2,481	8,636	998	497
Hungary (2002)	1,255	2,412	4,821	11,472	1,426	919
Iceland (2001)	209	466	1,747	5,877	647	323
Ireland (2001)	389	1,102	3,197	10,993	820	587
Italy (2001)	356	945	2,543	8,777	1,012	479
Japan (2002)	390	866	2,155	7,362	869	416
Korea (2002)	597	1,382	3,263	10,236	561	619
Luxembourg (2002)	333	860	2,217	4,751	839	401
Mexico (2001)	638	1,323	2,894	8,828	496	644
Netherlands (2003)	358	933	2,766	10,178	859	508
New Zealand (2000)	350	911	2,667	8,782	729	502
Norway (2001)	354	873	2,657	10,092	967	511
Poland (2002)	902	1,981	4,218	10,536	1,035	788
Portugal (2002)	572	1,154	2,931	10,071	1,112	605
Slovak Republic (2000)	944	2,229	4,993	11,709	1,072	874
Spain (2001)	453	1,048	2,568	8,719	953	506
Sweden (2001)	334	821	2,390	9,465	1,033	461
Switzerland (2000)	353	890	2,372	9,159	862	476
Turkey	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
United Kingdom (2002)	399	1,007	2,788	9,599	996	521
United States (2000)	543	1,231	2,980	9,088	853	584

(continued)

Table S14 (continued): Age-specific, crude and age-standardised death rates, OECD countries, latest year (per 100,000 population)

	Age group (years)					
Country (year)	**0[(a)]**	**1–4**	**5–14**	**15–24**	**25–34**	**35–44**
Females						
Australia (2005)	**465**	**21**	**9**	**25**	**38**	**80**
Australia (2001)	**434**	**23**	**9**	**29**	**42**	**87**
Austria (2002)	337	15	10	30	35	90
Belgium (1997)	509	23	13	35	49	116
Canada (2000)	471	18	12	34	41	91
Czech Republic (2002)	375	23	12	31	41	102
Denmark (1999)	343	19	14	25	47	127
Finland (2002)	289	12	10	30	44	102
France (2000)	373	23	12	32	46	112
Germany (2001)	378	22	11	28	35	96
Greece (2001)	442	16	13	28	38	73
Hungary (2002)	703	32	14	27	50	201
Iceland (2001)	301	—	18	28	34	66
Ireland (2001)	575	31	13	33	38	108
Italy (2001)	431	20	10	25	34	77
Japan (2002)	284	25	10	23	36	73
Korea (2002)	479	39	17	30	47	94
Luxembourg (2002)	423	18	4	20	44	88
Mexico (2001)	1,370	68	26	48	70	152
Netherlands (2003)	411	21	12	24	38	100
New Zealand (2000)	590	32	16	35	53	96
Norway (2001)	365	15	8	34	43	85
Poland (2002)	683	27	16	29	40	124
Portugal (2002)	470	34	20	33	56	116
Slovak Republic (2000)	717	30	17	30	39	120
Spain (2001)	372	21	13	25	41	87
Sweden (2001)	327	19	11	21	29	69
Switzerland (2000)	444	17	11	28	39	84
Turkey	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
United Kingdom (2002)	450	21	11	27	45	97
United States (2000)	622	29	15	43	64	143

(continued)

Table S14 (continued): Age-specific, crude and age-standardised death rates, OECD countries, latest year (per 100,000 population)

	Age group (years)					
Country (year)	**45–54**	**55–64**	**65–74**	**75+**	**Crude rate**	**ASR[(b)]**
Females						
Australia (2005)	**177**	**412**	**1,110**	**6,167**	**618**	**265**
Australia (2001)	**192**	**466**	**1,307**	**6,366**	**632**	**287**
Austria (2002)	231	509	1,397	7,605	987	320
Belgium (1997)	294	582	1,514	8,294	999	364
Canada (2000)	229	572	1,505	6,617	684	316
Czech Republic (2002)	291	706	2,144	8,975	1,029	412
Denmark (1999)	347	892	2,380	8,402	1,123	435
Finland (2002)	244	486	1,348	7,854	955	324
France (2000)	245	472	1,151	6,935	855	300
Germany (2001)	252	561	1,476	7,788	1,056	337
Greece (2001)	180	419	1,341	7,726	878	308
Hungary (2002)	497	950	2,391	8,914	1,201	487
Iceland (2001)	195	516	1,381	6,291	563	286
Ireland (2001)	275	589	1,781	8,503	751	380
Italy (2001)	194	455	1,244	6,827	945	289
Japan (2002)	187	370	920	4,981	694	225
Korea (2002)	200	516	1,574	7,815	463	340
Luxembourg (2002)	267	575	1,500	7,286	818	329
Mexico (2001)	366	951	2,157	7,369	387	452
Netherlands (2003)	280	576	1,537	7,996	890	349
New Zealand (2000)	251	639	1,575	6,655	657	336
Norway (2001)	232	551	1,455	7,786	981	332
Poland (2002)	341	756	1,977	8,098	851	406
Portugal (2002)	246	524	1,440	8,061	952	348
Slovak Republic (2000)	318	831	2,427	9,363	885	458
Spain (2001)	186	390	1,135	6,815	823	279
Sweden (2001)	227	515	1,427	7,753	1,075	320
Switzerland (2000)	195	496	1,179	7,350	873	302
Turkey	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
United Kingdom (2002)	261	621	1,743	8,259	1,050	368
United States (2000)	313	772	1,921	7,658	855	399

(a) Infant mortality per 100,000 births.

(b) Age-standardised rate. Reference population is the WHO Segi standard population. Standard death rates in this table are different from the rates in other tables because of the use of a different reference population.

Sources: WHO 2007; AIHW National Mortality Database.

Table S15: Age-standardised death rates[(a)], broad cause of death, selected years, 1921 to 2005 (per 100,000 population)

Sex/cause of death	1921	1941	1961	1971	1981	1991	2001	2004	2005
Males									
Infectious and parasitic[(b)]	216	98	19	10	6	7	11	11	10
Neoplasms	178	206	227	256	282	277	250	237	231
Blood diseases	11	6	5	5	4	9	2	2	2
Endocrine, nutritional[(c)]	18	27	19	26	21	24	27	29	26
Mental disorders	8	4	5	10	11	16	14	15	14
Nervous system diseases	47	28	16	14	15	20	24	23	23
Circulatory diseases	452	764	914	924	689	469	304	267	245
Respiratory diseases	239	178	131	148	121	97	74	71	64
Digestive diseases	65	65	45	36	43	35	25	25	24
Skin diseases	6	3	2	1	1	1	1	2	2
Musculoskeletal diseases	8	5	4	5	4	4	4	4	3
Genitourinary diseases	148	167	54	29	20	18	17	16	15
Perinatal diseases	49	39	18	15	6	5	4	3	4
Congenital diseases	8	9	9	8	6	5	3	3	3
Ill-defined conditions	411	141	21	9	7	5	3	6	6
Injury and poisoning	123	112	109	110	84	67	59	55	55
All causes	**1,987**	**1,853**	**1,600**	**1,606**	**1,318**	**1,056**	**824**	**770**	**728**
Females									
Infectious and parasitic[(b)]	159	59	10	6	4	4	7	7	6
Neoplasms	180	188	161	160	157	167	152	146	144
Blood diseases	14	7	6	4	3	3	2	2	2
Endocrine, nutritional[(c)]	29	45	24	26	19	18	18	20	20
Mental disorders	4	3	3	7	7	12	13	16	15
Nervous system diseases	39	24	10	10	9	14	20	20	20
Circulatory diseases	404	640	640	635	440	317	213	186	175
Respiratory diseases	184	140	56	52	40	42	42	44	39
Digestive diseases	64	46	28	22	24	24	18	18	17
Skin diseases	6	3	2	1	—	1	1	2	2
Musculoskeletal diseases	10	8	5	6	5	6	5	6	6
Genitourinary diseases	75	90	23	20	14	13	13	12	13
Pregnancy	22	13	2	1	—	—	—	—	—
Perinatal diseases	36	30	14	12	5	4	3	3	3
Congenital diseases	6	8	8	7	5	4	3	3	3
Ill-defined conditions	332	102	20	7	5	3	2	4	4
Injury and poisoning	38	46	48	50	33	27	23	23	22
All causes	**1,602**	**1,452**	**1,058**	**1,026**	**772**	**658**	**535**	**511**	**490**

(a) Age-standardised to the total Australian population at 30 June 2001.

(b) From 1996, includes AIDS and AIDS-related deaths.

(c) Before 1996, includes AIDS and AIDS-related deaths.

Source: AIHW General Record of Incidence of Mortality (GRIM) Books.

Table S16: Age-standardised death rates[(a)], broad cause of death, by state and territory of usual residence, 2005 (per 100,000 population)

Sex/cause of death	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Males									
Infectious and parasitic	13	7	8	9	10	9	9	24	10
Neoplasms	232	229	227	232	233	262	194	261	231
Blood diseases	3	2	2	3	2	2	1	1	2
Endocrine, nutritional	21	30	27	27	27	45	28	50	26
Mental disorders	14	15	12	15	18	15	13	31	14
Nervous system diseases	22	25	20	27	22	33	22	31	23
Circulatory diseases	247	233	249	237	265	255	220	258	245
Respiratory diseases	66	61	64	57	73	59	54	118	64
Digestive diseases	24	24	24	22	26	27	25	49	24
Skin diseases	3	1	2	2	1	—	1	2	2
Musculoskeletal diseases	3	4	3	3	3	10	1	2	3
Genitourinary diseases	16	15	13	14	19	17	20	29	15
Perinatal diseases	4	4	4	3	4	3	4	7	4
Congenital diseases	3	4	3	2	3	4	5	5	3
Ill-defined conditions	7	4	5	9	5	5	9	20	6
Injury and poisoning	49	53	58	54	68	73	53	129	55
All causes	**725**	**710**	**720**	**714**	**778**	**819**	**657**	**1,014**	**728**
Females									
Infectious and parasitic	7	5	5	7	5	6	6	13	6
Neoplasms	143	146	144	136	142	172	152	158	144
Blood diseases	2	2	1	3	2	4	3	7	2
Endocrine, nutritional	15	23	20	21	20	32	19	35	20
Mental disorders	15	15	12	14	20	17	18	40	15
Nervous system diseases	18	20	18	29	19	27	22	21	20
Circulatory diseases	179	169	184	157	175	186	159	181	175
Respiratory diseases	39	37	40	34	44	39	27	55	39
Digestive diseases	16	18	17	16	18	17	23	31	17
Skin diseases	2	1	1	1	2	2	1	7	2
Musculoskeletal diseases	5	6	5	6	5	13	9	13	6
Genitourinary diseases	13	12	13	10	13	15	11	37	13
Pregnancy	—	—	—	—	—	—	—	—	—
Perinatal diseases	3	3	4	3	3	1	3	5	3
Congenital diseases	2	3	3	2	2	2	3	2	3
Ill-defined conditions	4	3	4	6	3	4	7	7	4
Injury and poisoning	20	23	22	23	23	34	25	58	22
All causes	**485**	**487**	**494**	**467**	**495**	**571**	**486**	**671**	**490**

(a) Age-standardised to the total Australian population at 30 June 2001.

Source: AIHW General Record of Incidence of Mortality (GRIM) Books.

Table S17: Age-standardised death rates[(a)], selected causes, OECD countries, latest year (per 100,000 population)

Country (year)	Selected cause: Malignant neoplasms	Diabetes mellitus	Circulatory	Bronchitis, emphysema and asthma	Accidents & adverse events	All causes
Males						
Australia (2005)	**126**	**10**	**113**	**15**	**28**	**390**
Australia (2001)	**137**	**10**	**140**	**20**	**28**	**438**
Austria (2002)	147	13	197	20	33	526
Belgium (1997)	188	6	183	10	36	606
Canada (2000)	146	14	151	20	29	481
Czech Republic (2002)	209	7	312	14	47	709
Denmark (1999)	170	16	201	35	35	615
Finland (2002)	123	6	211	17	52	559
France (2000)	179	9	131	10	41	543
Germany (2001)	151	10	207	18	23	541
Greece (2001)	140	3	200	—	46	497
Hungary (2002)	251	12	382	25	56	919
Iceland (2001)	99	4	114	7	31	323
Ireland (2001)	153	7	217	4	32	587
Italy (2001)	160	11	160	15	31	479
Japan (2002)	141	5	107	8	25	416
Korea (2002)	183	27	137	31	50	619
Luxembourg (2002)	103	5	115	15	50	401
Mexico (2001)	77	67	141	28	59	644
Netherlands (2003)	156	11	158	25	18	508
New Zealand (2000)	150	14	178	27	33	502
Norway (2001)	137	8	179	19	28	511
Poland (2002)	209	8	312	19	52	788
Portugal (2002)	147	18	178	17	47	605
Slovak Republic (2000)	219	10	399	17	54	874
Spain (2001)	164	9	135	24	35	506
Sweden (2001)	118	9	185	12	27	461
Switzerland (2000)	141	9	153	16	n.a.	476
Turkey	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
United Kingdom (2002)	148	6	188	24	18	521
United States (2000)	144	16	200	27	41	584

(continued)

Table S17 (continued): Age-standardised death rates[(a)], selected causes, OECD countries, latest year (per 100,000 population)

Country (year)	Selected cause: Malignant neoplasms	Diabetes mellitus	Circulatory	Bronchitis, emphysema and asthma	Accidents & adverse events	All causes
Females						
Australia (2005)	**85**	**7**	**80**	**9**	**12**	**265**
Australia (2001)	**90**	**6**	**96**	**12**	**11**	**287**
Austria (2002)	90	8	137	8	11	320
Belgium (1997)	102	7	120	4	16	364
Canada (2000)	104	9	93	11	13	316
Czech Republic (2002)	116	6	205	5	17	412
Denmark (1999)	139	9	129	29	18	435
Finland (2002)	80	4	121	4	16	324
France (2000)	85	6	79	4	19	300
Germany (2001)	95	9	140	7	9	337
Greece (2001)	74	3	147	—	13	308
Hungary (2002)	129	10	230	9	22	487
Iceland (2001)	91	5	92	13	16	286
Ireland (2001)	114	5	128	3	11	380
Italy (2001)	88	10	108	5	12	289
Japan (2002)	72	3	65	2	10	225
Korea (2002)	74	19	94	13	19	340
Luxembourg (2002)	89	4	118	10	15	329
Mexico (2001)	72	70	113	18	17	452
Netherlands (2003)	105	10	99	12	9	349
New Zealand (2000)	108	10	118	17	14	336
Norway (2001)	101	5	108	13	13	332
Poland (2002)	107	7	182	5	15	406
Portugal (2002)	79	16	126	5	13	348
Slovak Republic (2000)	106	8	248	5	13	458
Spain (2001)	75	8	91	5	10	279
Sweden (2001)	95	6	118	9	10	320
Switzerland (2000)	88	8	102	6	n.a.	302
Turkey	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
United Kingdom (2002)	109	4	122	16	8	368
United States (2000)	104	13	136	19	18	399

(a) Reference population is the WHO Segi standard population. Standard death rates in this table are different from the rates in other tables because of the use of a different reference population.

Sources: WHO 2007; AIHW National Mortality Database.

Young offenders

Table S18: Social indicators among NSW young offenders, 2003 (per cent)

	Males		Females		Persons	
Social indicator	Community (659–673)	Custody (198–209)	Community (114–118)	Custody (17–18)	Community (774–791)	Custody (215–227)
Not attending school[(a)]	82	81	84	83	82	82
Suspended from school	90	90	85	100	89	91
Victim of bullying at school	29	19	37	29	30	20
History of care	21	28	36	39	24	28
Not living in the family home[(b)]	34	35	46	17	36	33
History of parental/ step-parent imprisonment	25	42	38	50	27	43
Parent currently in prison	4	10	7	22	5	11
Deceased parent	10	10	6	4	10	9
Lives with person with a physical or mental health problem affecting their daily life	20	19	30	17	21	19

(a) Refers to period before incarceration for custody group.

(b) Refers to 6 months before incarceration for custody group.

Note: Numbers in brackets represent the sample numbers for each indicator.

Source: Kenny et al. 2006.

Table S19: Indicators of health status among NSW young offenders, 2003 (per cent)

	Males		Females		Persons	
Health condition[(a)]	**Community (670–674)**	**Custody (173–208)**	**Community (117–118)**	**Custody (16–18)**	**Community (787–792)**	**Custody (191–226)**
Chicken pox	60	55	32	44	61	54
Asthma	33	28	34	56	33	30
Mental/behavioural problem[(b)]	34	43	29	35	32	43
Ear infection	26	28	39	39	28	29
Tonsillitis	23	27	35	39	25	28
Chest infections	20	15	29	17	22	15
Back problems	17	20	20	33	17	21
Allergy	15	11	15	11	15	11
Skin condition	12	11	18	17	13	11
Measles	10	12	8	17	10	13
Recent (past 4 weeks) health complaints						
Tiredness/energy loss	36	34	51	33	39	34
Trouble sleeping	38	40	46	67	39	42
Forgetting things	31	25	37	33	32	26
Headaches	26	23	39	39	28	24
Poor appetite	25	17	26	17	25	17
Bloodborne viruses[(c)]	**Community (431–449)**	**Custody (162–181)**	**Community (72–80)**	**Custody (14–17)**	**Community (507–529)**	**Custody (178–197)**
Hepatitis C antibody	3	8	12	18	5	9
Hepatitis B core antibody	4	11	4	18	4	11
Hepatitis B surface antigen	<1	3	1	12	<1	4
HIV antibody	0	0	0	0	0	0
Any bloodborne virus (above)	4	12	14	29	5	13

(a) Multiple responses permitted.

(b) Obtained using the Adolescent Psychopathology Scale.

(c) Obtained through serological screening.

Note: Numbers in brackets represent the sample numbers for each indicator.

Source: Kenny et al. 2006.

Table S20: Indicators of risk behaviours among NSW young offenders, 2003 (per cent)

	Males		Females		Persons	
Indicators of risk behaviours	**Community (671–674)**	**Custody (186–208)**	**Community (114–116)**	**Custody (17–18)**	**Community (673–789)**	**Custody (190–219)**
Cannabis	89	88	89	8	89	88
Amphetamine	44	46	57	59	46	47
Ecstasy/other amphetamine	38	34	45	35	39	34
Ever tried alcohol	97	96	98	100	97	96
Ever been drunk	91	84	91	100	91	85
Unable to stop drinking once started (weekly)	8	18	6	35	7	19
Current tobacco smoker[(a)]	81	57[(a)]	81	67[(a)]	81	58[(a)]
Age first started smoking tobacco	12 years	12 years	12 years	12 years	12 years	12 years

(a) Note that tobacco is currently banned in NSW Juvenile Detention Centres.

Note: Numbers in brackets represent the sample numbers for each indicator.

Source: Kenny et al. 2006.

Infectious diseases

Table S21: Notifiable diseases, 2004 to 2007

	Notifications				Notifications per 100,000 population			
Disease	**2004**	**2005**	**2006**	**2007**	**2004**	**2005**	**2006**	**2007**
Bloodborne diseases								
Hepatitis B (incident)	283	251	295	278	1.4	1.2	1.4	1.3
Hepatitis B (unspecified)[(a)]	5,784	6,327	6,272	7,416	28.7	31.0	30.3	35.3
Hepatitis C (incident)	314	373	435	328	1.6	1.8	2.1	1.6
Hepatitis C (unspecified)[(a)(b)]	12,725	12,005	12,072	13,108	63.2	58.8	58.3	62.4
Hepatitis D	29	30	31	34	0.1	0.1	0.1	0.2
Hepatitis (nec)	—	—	1	—	—	—	—	—
Gastrointestinal diseases								
Botulism	1	3	1	1	—	—	—	—
Campylobacteriosis[(c)]	15,580	16,490	15,470	17,663	77.4	80.8	74.7	84.0
Cryptosporidiosis	1,684	3,212	3,214	2,850	8.4	15.7	15.5	13.6
Haemolytic uraemic syndrome	16	20	13	20	0.1	0.1	0.1	0.1
Hepatitis A	319	326	280	165	1.6	1.6	1.4	0.8
Hepatitis E	28	30	24	18	0.1	0.1	0.1	0.1
Listeriosis	67	54	61	50	0.3	0.3	0.3	0.2
Salmonellosis (nec)	7,843	8,425	8,272	9,694	38.9	41.3	40.0	46.1
Shigellosis	520	729	547	615	2.6	3.6	2.6	2.9
SITEC, VTEC[(d)]	49	86	71	112	0.2	0.4	0.3	0.5
Typhoid	76	52	77	91	0.4	0.3	0.4	0.4
Other bacterial infections								
Legionellosis	312	331	353	304	1.6	1.6	1.7	1.4
Leprosy	7	10	6	12	—	—	—	0.1
Meningococcal infection	405	392	317	310	2.0	1.9	1.5	1.5
Tuberculosis	1,138	1,083	1,207	1,116	5.7	5.3	5.8	5.3
Quarantinable diseases								
Cholera	5	3	3	3	—	—	—	—
Plague	—	—	—	—	—	—	—	—
Rabies	—	—	—	—	—	—	—	—
Viral haemorrhagic fever (nec)	—	—	—	—	—	—	—	—
Yellow fever	—	—	—	—	—	—	—	—
Sexually transmissible infections								
Chlamydial infection	36,223	41,374	47,239	51,089	179.9	202.7	228.2	243.1
Donovanosis	10	13	6	3	0.1	0.1	—	—
Gonococcal infection	7,183	8,084	8,596	7,553	35.7	39.6	41.5	35.9
Syphilis	138	1	41	46	0.7	0.0	0.2	0.2
Syphilis—congenital	13	15	13	9	0.1	0.1	0.1	—
Syphilis < 2 years	622	639	825	1,241	3.1	3.1	4.0	5.9
Syphilis > 2 years or unspecified	1,583	1,598	1,824	1,761	7.9	7.8	8.8	8.4

(continued)

Table S21 (continued): Notifiable diseases, 2003 to 2006

Disease	Notifications				Notifications per 100,000 population			
	2004	2005	2006	2007	2004	2005	2006	2007
Vaccine-preventable diseases								
Diphtheria	—	—	—	—	—	—	—	—
Haemophilus influenzae type b	15	17	22	17	0.1	0.1	0.1	0.1
Influenza (laboratory confirmed)	2,136	4,565	3,258	10,687	10.6	22.4	15.7	50.8
Measles	45	10	125	11	0.2	0.0	0.6	0.1
Mumps	102	241	275	570	0.5	1.2	1.3	2.7
Pertussis	8,756	11,200	11,019	5,396	43.5	54.9	53.2	25.7
Pneumococcal disease (invasive)	2,370	1,745	1,472	1,485	11.8	8.6	7.1	7.1
Poliomyelitis	—	—	—	1	—	—	—	—
Rubella	31	31	60	35	0.2	0.2	0.3	0.2
Rubella—congenital	1	1	—	1	—	—	—	—
Tetanus	5	2	3	3	—	—	—	—
Vectorborne diseases								
Barmah Forest virus infection	1,105	1,323	2,124	1,695	5.5	6.5	10.3	8.1
Dengue	351	221	189	318	1.7	1.1	0.9	1.5
Flavivirus infection (nec)	61	27	32	23	0.3	0.1	0.2	0.1
Japanese encephalitis virus	1	—	—	—	—	—	—	—
Kunjin virus[(e)]	12	1	3	—	0.1	—	—	—
Malaria	557	822	767	578	2.8	4.0	3.7	2.8
Murray Valley encephalitis virus	1	2	1	—	—	—	—	—
Ross River virus infection	4,210	2,544	5,502	4,152	20.9	12.5	26.6	19.8
Zoonoses								
Anthrax	—	—	1	1	—	—	—	—
Australian bat lyssavirus	—	—	—	—	—	—	—	—
Brucellosis	38	41	50	40	0.2	0.2	0.2	0.2
Leptospirosis	177	129	148	106	0.9	0.6	0.7	0.5
Lyssavirus (nec)	—	—	—	—	—	—	—	—
Ornithosis	239	164	171	96	1.2	0.8	0.8	0.5
Q fever	464	353	405	441	2.3	1.7	2.0	2.1

nec = not elsewhere classified.

(a) Unspecified hepatitis includes cases with hepatitis in whom the duration of illness cannot be determined.

(b) Includes incident hepatitis C in the Northern Territory and Queensland.

(c) Notified as 'foodborne disease' or 'gastroenteritis in an institution' in New South Wales.

(d) Infections with Shiga-like toxin (verotoxin) producing E. coli. (SITEC/VTEC).

(e) Reported as Murray Valley encephalitis in the Australian Capital Territory.

Source: NNDSS 2008.

Table S22: Characteristics of AIDS cases, by year of diagnosis[a]

Characteristic	≤1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Total cases	**7,910**	**329**	**215**	**263**	**213**	**242**	**242**	**192**	**224**	**195**
Per cent males	95.5	92.7	89.3	90.9	88.7	91.3	93.0	87.5	87.9	88.7
Median age (years)										
Males	37	39	39	40	40	41	42	43	42	43
Females	33	35	34	32	36	33	35	44	39	35
State/territory (per cent) [b]										
NSW	58	54	58	49	47	46	59	51	48	45
Vic	21	21	18	25	25	20	20	21	26	32
Qld	10	12	16	16	14	21	10	15	16	9
WA	5	5	2	6	10	5	6	5	4	5
SA	4	6	5	3	4	6	2	6	4	7
Tas	1	1	0	0	1	1	0	1	1	2
ACT	1	2	0	1	0	1	2	1	0	0
NT	0	1	1	0	1	0	2	2	0	1
HIV exposure category (per cent)[c]										
Male homosexual contact	84	68	66	68	69	72	66	62	62	60
Male homosexual contact and injecting drug use	5	4	6	7	4	7	8	10	9	6
Injecting drug use[d]	3	7	6	6	4	4	7	7	7	5
Heterosexual contact	5	18	21	17	20	16	19	21	21	8
Haemophilia/coagulation disorder	2	0	1	1	1	1	0	1	0	0
Receipt of blood/tissue	2	1	1	0	1	0	0	1	1	1
Mother with/at risk of HIV infection	0	1	0	0	2	0	0	0	1	0
Other/undetermined	3	6	10	7	4	5	8	7	7	6
AIDS defining condition (per cent)										
Pneumocystis pneumonia (PCP)	28	22	20	27	28	30	24	28	25	28
Kaposi's sarcoma (KS)	12	9	8	9	10	5	9	6	9	11
PCP and other (not KS)	5	7	8	7	8	7	8	7	10	6
Oesophageal candidiasis	10	11	14	12	7	12	9	6	11	11
Mycobacterium avium	5	4	3	3	2	2	3	2	1	2
HIV wasting disease	5	10	13	6	4	5	7	3	2	5
Other conditions	35	37	35	36	41	39	41	48	43	36

(a) Not adjusted for reporting delay.

(b) Figures may not add up to 100 because of rounding.

(c) The 'Other/undetermined' category was excluded from the percentage of cases attributed to each HIV exposure category.

(d) Excludes males who also reported a history of homosexual contact.

Source: NCHECR 2007.

Table S23: Most frequently occurring cancers(a), 2004

Cancer (ICD code)	New cases: Number	New cases: Per cent	New cases: Rate(b)	New cases: Risk(c)	Deaths: Number	Deaths: Per cent	Deaths: Rate(b)	Deaths: PYLL(d)
Males								
Prostate (C61)	15,759	28.7	163.4	1 in 5	2,792	12.9	33.0	20,560
Colorectal (C18–C20)	7,160	13.0	75.1	1 in 10	2,196	10.1	23.8	30,770
Lung (C33–C34)	5,826	10.6	61.6	1 in 11	4,733	21.8	50.8	64,090
Melanoma of skin (C43)	5,503	10.0	56.6	1 in 15	815	3.8	8.7	14,868
Lymphoma (C81–C85, C96)	2,352	4.3	24.3	1 in 33	803	3.7	8.8	12,260
Unknown primary site (C26, C39, C76–C80)	1,700	3.1	18.5	1 in 40	1,781	8.2	19.7	23,385
Bladder (C67)	1,642	3.0	17.9	1 in 39	589	2.7	6.8	5,308
Leukaemia (C91–C95)	1,578	2.9	16.8	1 in 47	833	3.8	9.3	12,148
Kidney (C64)	1,395	2.5	14.2	1 in 55	497	2.3	5.3	7,670
Stomach (C16)	1,275	2.3	13.6	1 in 52	720	3.3	7.9	9,818
All cancers (C00–C97(a), D45–D47(e))	**54,870**	**100.0**	**573.4**	**1 in 2**	**21,670**	**100.0**	**237.5**	**295,080**
Females								
Breast (C50)	12,126	27.9	112.8	1 in 9	2,664	15.8	23.8	48,910
Colorectal (C18–C20)	5,817	13.4	51.5	1 in 14	1,872	11.1	16.0	21,798
Melanoma of skin (C43)	4,219	9.7	39.4	1 in 24	385	2.3	3.4	6,790
Lung (C33–C34)	3,270	7.5	29.3	1 in 24	2,526	15.0	22.3	34,770
Lymphoma (C81–C85, C96)	1,920	4.4	17.5	1 in 46	736	4.4	6.3	8,725
Uterus, body (C54)	1,718	4.0	15.8	1 in 52	202	1.2	1.8	2,510
Unknown primary site (C26, C39, C76, C80)	1,592	3.7	13.6	1 in 54	1,741	10.4	14.5	17,635
Ovary (C56)	1,246	2.9	11.4	1 in 73	851	5.1	7.6	13,083
Thyroid (C73)	1,128	2.6	10.9	1 in 103	51	0.3	0.4	555
Leukaemia (C91–C95)	1,087	2.5	9.8	1 in 83	612	3.6	5.2	8,350
All cancers (C00–C97(a), D45–D47(e))	**43,466**	**100.0**	**395.4**	**1 in 3**	**16,819**	**100.0**	**145.8**	**229,483**

(a) Non-melanoma skin cancers (ICD-10 code C44), known to be the most common cancer type, are excluded from this list because basal cell carcinoma and squamous cell carcinoma, the two most common types of non-melanoma skin cancer, are not notifiable cancers. However, C44 is included in the total in the mortality column.

(b) Rates are age-standardised to the Australian population at 30 June 2001 and expressed per 100,000 population.

(c) Risk in 2004 of being diagnosed with a particular cancer before reaching age 85 years.

(d) Potential years of life lost between the ages of 0 and 84 years.

(e) Only includes ICD-10 codes D47.1 and D47.3.

Sources: AIHW National Cancer Statistics Clearing House and National Mortality Database.

Table S24: Major cancers[(a)], age-standardised incidence rates[(b)], 1996–2004

Cancer (ICD code)	1996	1997	1998	1999	2000	2001	2002	2003	2004
Males									
Prostate (C61)	137.6	129.8	128.1	129.5	128.2	130.3	134.4	146.8	163.4
Colorectal (C18–C20)	78.3	77.2	74.8	75.2	79.6	78.4	75.7	73.8	75.1
Lung (C33–C34)	69.8	69.3	67.5	65.6	63.4	62.1	60.7	58.6	61.6
Melanoma of skin (C43)	53.8	56.0	52.3	54.2	54.7	55.5	59.9	58.1	56.6
Lymphoma (C81–C85, C96)	23.9	23.4	22.9	23.6	24.1	23.8	24.6	24.4	24.3
Unknown primary site (C26, C39, C76, C80)	22.2	22.0	20.2	19.1	18.8	19.4	19.9	18.6	18.5
Bladder (C67)	20.6	20.8	20.7	20.7	21.0	21.2	19.8	18.6	17.9
Leukaemia (C91–C95)	16.8	16.2	16.3	17.3	17.2	16.9	17.5	16.5	16.8
Kidney (C64)	13.0	12.7	13.8	14.5	14.3	14.5	14.3	13.7	14.2
Stomach (C16)	15.7	15.6	15.4	16.1	15.1	13.8	13.6	13.3	13.6
All cancers (C00–C97[(a)], D45–D47[(c)])	**563.0**	**553.2**	**544.0**	**545.4**	**544.8**	**548.7**	**553.6**	**556.7**	**573.4**
Females									
Breast (C50)	109.1	111.4	114.6	111.2	115.6	117.2	117.2	112.2	112.8
Colorectal (C18–C20)	52.3	52.5	52.0	53.8	52.7	54.5	51.8	51.5	51.5
Melanoma of skin (C43)	38.1	40.3	37.1	37.6	38.4	38.4	40.8	38.0	39.4
Lung (C33–C34)	26.4	27.0	26.3	26.2	27.9	28.0	28.9	27.7	29.3
Lymphoma (C81–C85, C96)	16.9	17.4	17.1	17.2	17.7	17.0	17.9	17.1	17.5
Uterus, body (C54)	14.4	14.6	14.5	14.2	15.3	14.4	15.3	15.2	15.8
Unknown primary site (C26, C39, C76, C80)	15.1	15.1	15.4	14.1	14.3	13.7	14.8	14.2	13.6
Ovary (C56)	11.9	11.4	11.8	11.6	11.2	10.9	11.6	10.5	11.4
Thyroid (C73)	7.2	6.9	7.7	8.0	8.1	9.1	9.2	10.3	10.9
Leukaemia (C91–C95)	10.2	9.5	10.0	10.5	9.7	10.2	10.4	10.0	9.8
All cancers (C00–C97[(a)], D45–D47[(c)])	**385.9**	**390.2**	**392.0**	**388.0**	**394.5**	**396.8**	**402.7**	**389.9**	**395.4**

(a) Non-melanoma skin cancers (ICD-10 code C44), known to be the most common cancer type, are excluded from this list because basal cell carcinoma and squamous cell carcinoma, the two most common types of non-melanoma skin cancer, are not notifiable cancers.

(b) Rates are age-standardised to the Australian population at 30 June 2001 and expressed per 100,000 population.

(c) Only includes ICD-10 codes D47.1 and D47.3.

Source: AIHW National Cancer Statistics Clearing House.

Oral health

Table S25: Primary teeth with caries experience[a], children aged 5–10 years, 1991 to 2002 (mean number of teeth)

	Age (years)					
Year	5	6	7	8	9	10
1991	1.81	2.00	2.17	2.28	2.23	1.83
1992	1.80	1.95	1.93	2.21	2.11	1.74
1993	1.76	1.90	2.01	2.15	2.13	1.73
1994	1.56	1.79	1.95	2.13	2.01	1.71
1995	1.49	1.73	1.87	2.05	1.97	1.61
1996	1.26	1.45	1.66	1.68	1.72	1.47
1997	1.28	1.50	1.63	1.78	1.75	1.47
1998	1.37	1.51	1.62	1.81	1.70	1.40
1999	1.55	1.51	1.69	1.81	1.69	1.31
2000	1.49	1.65	1.79	1.82	1.66	1.30
2001	1.81	1.89	2.28	2.22	2.00	1.55
2002	1.83	1.96	2.22	2.32	1.98	1.60

(a) As measured by dmft index (number of decayed, missing due to caries and filled primary teeth).

Source: AIHW Dental Statistics and Research Unit.

Table S26: Permanent teeth with caries experience[a], children aged 7–14 years, 1991 to 2002 (mean number of teeth)

	Age (years)							
Year	7	8	9	10	11	12	13	14
1991	0.24	0.40	0.56	0.83	0.91	1.29	1.83	2.67
1992	0.21	0.38	0.53	0.69	0.90	1.22	n.a.	n.a.
1993	0.22	0.36	0.51	0.66	0.90	1.10	1.61	1.94
1994	0.23	0.37	0.47	0.65	0.88	1.09	1.54	2.00
1995	0.20	0.36	0.46	0.57	0.79	1.01	1.66	1.69
1996	0.18	0.30	0.38	0.49	0.66	0.90	1.35	1.30
1997	0.17	0.30	0.42	0.52	0.65	0.86	1.15	1.60
1998	0.21	0.32	0.41	0.58	0.64	0.83	1.13	1.29
1999	0.20	0.30	0.42	0.53	0.69	0.83	1.28	1.33
2000	0.22	0.31	0.40	0.50	0.66	0.84	1.09	1.38
2001	0.27	0.44	0.53	0.61	0.76	0.95	1.36	1.77
2002	0.28	0.43	0.54	0.65	0.75	1.02	1.37	1.72

(a) As measured by DMFT index (number of decayed, missing due to caries and filled permanent teeth).

Source: AIHW Dental Statistics and Research Unit.

Table S27: Dental caries experience[(a)] of 6 year old and 12 year old children, states and territories, 1991 to 2002 (mean number of teeth)

Age/year	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
6 year old (dmft)									
1991	2.05	2.04	2.48	1.29	1.98	1.57	1.14	1.96	1.94
1992	2.00	2.05	2.37	1.32	1.53	1.48	1.09	1.99	1.95
1993	2.04	1.81	2.18	1.48	1.38	1.35	1.33	1.81	1.90
1994	1.93	1.67	2.27	1.37	1.17	n.a.	1.17	1.99	1.79
1995	1.75	1.78	1.99	1.39	1.47	1.48	1.39	1.99	1.73
1996	0.94	1.61	2.25	1.30	1.17	1.37	0.89	1.79	1.45
1997	0.97	1.92	1.97	1.45	1.39	1.45	1.05	1.81	1.50
1998	0.90	2.08	2.04	1.43	1.24	1.40	1.40	2.00	1.51
1999	0.99	1.93	2.24	1.45	1.50	1.58	1.19	2.14	1.51
2000	1.04	2.00	2.39	1.70	1.65	1.74	1.90	2.41	1.65
2001	(b)	1.85	2.44	1.62	1.63	1.78	1.63	1.96	1.89
2002	(b)	1.90	2.44	1.72	1.73	1.71	1.91	2.28	1.96
12 year old (DMFT)									
1991	1.18	1.38	1.54	1.43	1.06	1.18	0.91	1.26	1.29
1992	1.19	1.77	1.50	1.22	1.04	0.98	0.76	0.91	1.22
1993	1.04	1.52	1.44	1.20	0.64	0.96	0.77	0.85	1.10
1994	1.11	1.28	1.37	1.07	0.59	n.a.	0.69	0.81	1.09
1995	0.93	1.02	1.37	1.04	0.64	0.86	0.61	0.82	1.01
1996	0.64	1.09	1.30	0.99	0.47	0.96	0.56	0.71	0.90
1997	0.64	1.04	1.14	0.87	0.58	0.97	0.82	0.78	0.86
1998	0.49	1.15	1.22	0.77	0.52	1.39	0.68	0.79	0.83
1999	0.55	1.11	1.30	0.75	0.58	1.15	0.74	0.86	0.83
2000	0.55	1.07	1.17	0.89	0.60	0.98	1.40	0.97	0.84
2001	(b)	0.92	1.25	0.82	0.67	1.27	1.57	0.73	0.95
2002	(b)	0.98	1.26	0.92	0.84	1.22	1.27	0.84	1.02

(a) As measured by dmft or DMFT index (number of decayed, missing and filled primary or permanent teeth).

(b) Data not used for New South Wales in 2001 and 2002.

Source: AIHW Dental Statistics and Research Unit.

Table S28: Separations[a] from public hospitals, by age group and sex, states and territories, 2005–06

Age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Males									
Under 1	21,832	19,194	11,936	4,614	5,106	1,261	951	1,533	66,427
1–4	28,148	18,442	14,923	7,022	6,900	1,363	1,081	1,611	79,490
5–14	36,735	24,697	19,966	9,777	8,008	1,923	1,488	1,607	104,201
15–24	43,185	33,156	25,908	12,652	10,206	2,736	2,104	2,284	132,231
25–34	50,519	44,016	29,004	14,343	12,989	3,833	3,090	3,767	161,561
35–44	63,984	57,795	35,933	19,801	17,935	3,914	3,523	7,282	210,167
45–54	76,715	72,824	47,436	25,084	21,868	5,624	5,058	9,449	264,058
55–64	97,120	99,718	57,555	30,859	29,875	6,822	6,941	5,516	334,406
65–74	117,203	119,563	61,766	31,798	31,767	8,244	6,263	3,428	380,032
75 and over	147,264	129,139	59,347	35,377	38,453	8,794	6,578	1,385	426,337
Total	*682,712*	*618,544*	*363,774*	*191,327*	*183,107*	*44,514*	*37,077*	*37,862*	*2,158,917*
Females									
Under 1	16,398	14,571	9,275	3,578	3,807	944	748	1,226	50,547
1–4	20,390	13,468	11,143	4,938	4,895	978	749	1,199	57,760
5–14	25,185	18,727	14,601	6,906	6,081	1,586	1,117	1,074	75,277
15–24	67,531	54,183	46,054	19,060	18,754	4,889	3,380	4,893	218,744
25–34	113,822	101,619	65,014	30,167	27,945	7,527	5,429	6,167	357,690
35–44	79,256	77,644	44,049	25,638	22,235	5,797	4,511	7,069	266,199
45–54	68,207	72,153	42,615	24,511	21,580	6,059	3,217	9,607	247,949
55–64	79,798	80,122	45,662	23,884	21,288	6,294	4,486	7,869	269,403
65–74	99,951	89,852	47,173	25,847	27,609	6,526	5,414	4,413	306,785
75 and over	167,150	131,956	60,957	39,104	40,366	9,189	6,008	2,006	456,736
Total	*737,691*	*654,295*	*386,543*	*203,633*	*194,560*	*49,789*	*35,059*	*45,523*	*2,307,093*
Total separations	**1,420,463**	**1,272,844**	**750,317**	**394,960**	**377,667**	**94,304**	**72,136**	**83,385**	**4,466,076**

(a) Separations for which the care type was reported as Newborn with no qualified days, and records for *Hospital boarders* and *Posthumous organ procurement,* have been excluded.

Note: Totals include separations for which age and/or sex was not reported.

Source: AIHW National Hospital Morbidity Database.

Table S29: Separations(a) from private hospitals, by age group and sex, states and territories, 2005–06

Age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Males									
Under 1	2,439	3,688	3,005	3,220	980	n.p.	n.p.	n.p.	13,732
1–4	5,505	3,000	4,440	2,915	1,646	n.p.	n.p.	n.p.	18,239
5–14	8,405	5,480	6,375	3,967	2,043	n.p.	n.p.	n.p.	27,423
15–24	18,214	15,862	13,499	9,553	5,137	n.p.	n.p.	n.p.	65,118
25–34	20,233	19,066	14,743	8,656	5,060	n.p.	n.p.	n.p.	70,775
35–44	32,828	30,160	27,001	14,885	8,833	n.p.	n.p.	n.p.	118,227
45–54	47,863	44,456	42,267	20,903	14,679	n.p.	n.p.	n.p.	177,177
55–64	73,394	60,562	71,876	29,400	20,932	n.p.	n.p.	n.p.	266,680
65–74	64,570	56,193	63,205	25,282	18,989	n.p.	n.p.	n.p.	236,289
75 and over	75,134	73,006	78,519	27,496	22,713	n.p.	n.p.	n.p.	285,671
Total	*348,585*	*311,473*	*324,930*	*146,277*	*101,012*	*n.p.*	*n.p.*	*n.p.*	*1,279,331*
Females									
Under 1	1,064	2,814	1,943	2,165	337	n.p.	n.p.	n.p.	8,617
1–4	3,317	1,950	3,067	1,865	1,117	n.p.	n.p.	n.p.	11,767
5–14	6,972	4,920	5,369	3,484	1,766	n.p.	n.p.	n.p.	23,498
15–24	26,265	27,912	24,857	13,573	6,225	n.p.	n.p.	n.p.	103,046
25–34	54,250	51,808	47,062	23,372	11,202	n.p.	n.p.	n.p.	196,946
35–44	60,078	63,584	52,424	24,700	14,473	n.p.	n.p.	n.p.	225,395
45–54	59,782	61,832	56,535	27,840	19,028	n.p.	n.p.	n.p.	234,971
55–64	68,213	65,273	65,460	28,837	21,219	n.p.	n.p.	n.p.	259,411
65–74	58,528	52,790	56,456	22,321	17,517	n.p.	n.p.	n.p.	214,537
75 and over	78,845	75,615	73,428	24,959	26,299	n.p.	n.p.	n.p.	288,364
Total	*417,314*	*408,498*	*386,601*	*173,116*	*119,183*	*n.p.*	*n.p.*	*n.p.*	*1,566,552*
Total separations	**765,899**	**719,981**	**711,531**	**319,393**	**220,197**	**n.p.**	**n.p.**	**n.p.**	**2,845,907**

(a) Separations for which the care type was reported as Newborn with no qualified days, and records for *Hospital boarders* and *Posthumous organ procurement,* have been excluded.

Note: Totals include separations for which age and/or sex was not reported.

Source: AIHW National Hospital Morbidity Database.

Table S30: Separation statistics[(a)], by principal diagnosis, grouped into ICD-10-AM chapters, public hospitals, 2005–06

Principal diagnosis		Separations	Per cent same-day separations	Patient days	ALOS (days)	ALOS (days) excluding same-day
A00–B99	Infectious and parasitic diseases	82,711	24.4	320,752	3.9	4.8
C00–D48	Neoplasms	249,151	44.8	1,251,218	5.0	8.3
D50–D89	Blood and blood-forming diseases	62,191	64.4	156,546	2.5	5.3
E00–E90	Endocrine, nutritional and metabolic	85,499	38.7	433,831	5.1	7.6
F00–F99	Mental and behavioural disorders	171,488	24.2	1,910,712	11.1	14.4
G00–G99	Nervous system diseases	99,420	41.7	449,469	4.5	7.0
H00–H59	Eye and adnexa diseases	65,306	84.0	83,910	1.3	2.8
H60–H95	Ear and mastoid process diseases	28,610	58.4	45,724	1.6	2.4
I00–I99	Circulatory diseases	303,767	21.9	1,591,541	5.2	6.4
J00–J99	Respiratory diseases	254,160	16.2	1,089,579	4.3	4.9
K00–K93	Digestive diseases	376,366	44.8	1,102,999	2.9	4.5
L00–L99	Skin and subcutaneous tissue diseases	81,760	36.5	343,958	4.2	6.0
M00–M99	Musculoskeletal diseases	160,443	42.4	631,976	3.9	6.1
N00–N99	Genitourinary diseases	203,261	46.8	552,951	2.7	4.2
O00–O99	Pregnancy, childbirth and the puerperium	325,100	24.7	885,814	2.7	3.3
P00–P96	Conditions originating in the perinatal period	43,358	12.7	408,031	9.4	10.6
Q00–Q99	Congenital malformations	22,945	48.0	91,950	4.0	6.8
R00–R99	Symptoms, signs	312,193	44.2	691,824	2.2	3.2
S00–T98	Injury and poisoning	394,364	33.8	1,563,163	4.0	5.5
Z00–Z99	Factors influencing health status and contact with health services	1,142,976	89.1	3,346,470	2.9	18.7
	Not reported	1,007	21.4	40,608	40.3	51.1
Total		**4,466,076**	**49.6**	**16,993,026**	**3.8**	**6.6**

(a) Separations for which the care type was reported as Newborn with no qualified days, and records for *Hospital boarders* and *Posthumous organ procurement,* have been excluded.

Note: ALOS = average length of stay.

Source: AIHW National Hospital Morbidity Database.

Table S31: Separation statistics[(a)], by principal diagnosis, grouped into ICD-10-AM chapters, private hospitals, 2005–06

Principal diagnosis		Separations	Per cent same-day separations	Patient days	ALOS (days)	ALOS (days) excluding same-day
A00–B99	Infectious and parasitic diseases	13,427	27.4	63,703	4.7	6.2
C00–D48	Neoplasms	261,361	61.2	785,281	3.0	6.2
D50–D89	Blood and blood-forming diseases	26,972	72.3	52,439	1.9	4.4
E00–E90	Endocrine, nutritional and metabolic	46,088	49.8	138,901	3.0	5.0
F00–F99	Mental and behavioural disorders	125,874	75.1	622,127	4.9	16.8
G00–G99	Nervous system diseases	68,545	32.3	142,991	2.1	2.6
H00–H59	Eye and adnexa diseases	140,068	91.5	143,922	1.0	1.3
H60–H95	Ear and mastoid process diseases	23,899	73.2	30,383	1.3	2.0
I00–I99	Circulatory diseases	154,848	32.3	618,321	4.0	5.4
J00–J99	Respiratory diseases	80,045	16.3	317,852	4.0	4.5
K00–K93	Digestive diseases	437,925	76.2	693,775	1.6	3.5
L00–L99	Skin and subcutaneous tissue diseases	40,849	66.2	118,072	2.9	6.6
M00–M99	Musculoskeletal diseases	233,765	43.0	716,794	3.1	4.6
N00–N99	Genitourinary diseases	160,723	56.2	329,847	2.1	3.4
O00–O99	Pregnancy, childbirth and the puerperium	142,218	36.2	463,664	3.3	4.5
P00–P96	Conditions originating in the perinatal period	10,701	4.4	79,743	7.5	7.8
Q00–Q99	Congenital malformations	10,203	57.4	20,234	2.0	3.3
R00–R99	Symptoms, signs	142,796	64.2	278,370	1.9	3.6
S00–T98	Injury and poisoning	89,772	27.9	411,458	4.6	6.0
Z00–Z99	Factors influencing health status and contact with health services	634,185	89.7	1,302,885	2.1	11.2
	Not reported	1,643	71.4	6,865	4.2	12.1
Total		**2,845,907**	**64.2**	**7,337,627**	**2.6**	**5.4**

(a) Separations for which the care type was reported as Newborn with no qualified days, and records for *Hospital boarders* and *Posthumous organ procurement,* have been excluded.

Note: ALOS = average length of stay.

Source: AIHW National Hospital Morbidity Database.

Table S32: Separation statistics[(a)], by ICD-10-AM procedure groupings, public hospitals, 2005–06

Procedure block		Separations	Per cent same-day separations	Patient days	ALOS (days)	ALOS (days) excluding same-day
1–86	Procedures on nervous system	67,808	39.4	451,440	6.7	10.3
110–129	Procedures on endocrine system	6,237	3.2	28,790	4.6	4.7
160–256	Procedures on eye and adnexa	75,454	84.7	112,056	1.5	4.2
300–333	Procedures on ear and mastoid process	24,585	65.3	48,438	2.0	3.8
370–422	Procedures on nose, mouth and pharynx	50,324	29.2	106,705	2.1	2.6
450–490	Dental services	30,258	82.4	96,381	3.2	13.4
520–569	Procedures on respiratory system	81,077	20.9	1,071,124	13.2	16.4
600–767	Procedures on cardiovascular system	185,906	26.6	1,716,676	9.2	12.2
800–817	Procedures on blood and blood-forming organs	29,246	35.1	224,262	7.7	11.3
850–1011	Procedures on digestive system	387,497	51.6	1,596,954	4.1	7.5
1040–1129	Procedures on urinary system	850,545	92.1	1,395,820	1.6	9.1
1160–1203	Procedures on male genital organs	37,433	54.1	94,576	2.5	4.3
1240–1299	Gynaecological procedures	137,181	64.7	263,754	1.9	3.6
1330–1347	Obstetric procedures	174,859	5.1	627,540	3.6	3.7
1360–1579	Procedures on musculoskeletal system	225,861	30.3	1,240,733	5.5	7.4
1600–1718	Dermatological and plastic procedures	173,159	47.9	961,180	5.6	9.7
1740–1759	Procedures on breast	19,221	44.9	49,074	2.6	3.8
1780–1799	Chemotherapeutic & radiation oncology procedures	9,033	13.5	92,375	10.2	11.7
1820–1916	Non-invasive, cognitive & other interventions (nec)	2,151,057	40.0	11,864,940	5.5	8.5
1940–2016	Imaging services	423,181	15.6	3,874,923	9.2	10.7
	No procedure or not reported	1,138,266	36.9	3,368,711	3.0	4.1
Total[(b)]		**4,466,076**	**49.6**	**16,993,026**	**3.8**	**6.6**

(a) Separations for which the care type was reported as Newborn with no qualified days, and records for *Hospital boarders* and *Posthumous organ procurement,* have been excluded.

(b) As more than one procedure can be reported for each separation, the totals are not the sums of the rows of the table.

Note: ALOS = average length of stay; nec = not elsewhere classified.

Source: AIHW National Hospital Morbidity Database.

Table S33: Separation statistics[(a)], by ICD–10–AM procedure groupings, private hospitals, 2005–06

Procedure block		Separations	Per cent same-day separations	Patient days	ALOS (days)	ALOS (days) excluding same-day
1–86	Procedures on nervous system	75,881	52.4	263,967	3.5	6.2
110–129	Procedures on endocrine system	6,138	1.4	19,116	3.1	3.1
160–256	Procedures on eye and adnexa	152,202	91.4	157,621	1.0	1.4
300–333	Procedures on ear and mastoid process	25,865	71.9	30,944	1.2	1.7
370–422	Procedures on nose, mouth and pharynx	62,595	35.0	80,477	1.3	1.4
450–490	Dental services	92,547	95.8	97,924	1.1	2.4
520–569	Procedures on respiratory system	25,346	26.6	210,529	8.3	10.9
600–767	Procedures on cardiovascular system	138,825	35.0	653,030	4.7	6.7
800–817	Procedures on blood and blood-forming organs	19,600	28.8	97,953	5.0	6.6
850–1011	Procedures on digestive system	599,078	77.7	1,095,576	1.8	4.7
1040–1129	Procedures on urinary system	259,988	81.7	458,595	1.8	5.2
1160–1203	Procedures on male genital organs	57,809	57.9	131,191	2.3	4.0
1240–1299	Gynaecological procedures	184,310	77.8	295,825	1.6	3.7
1330–1347	Obstetric procedures	77,068	1.3	374,029	4.9	4.9
1360–1579	Procedures on musculoskeletal system	258,611	41.9	842,270	3.3	4.9
1600–1718	Dermatological and plastic procedures	169,315	71.5	354,628	2.1	4.8
1740–1759	Procedures on breast	33,245	41.7	65,951	2.0	2.7
1780–1799	Chemotherapeutic & radiation oncology procedures	3,029	15.7	28,504	9.4	11.0
1820–1916	Non-invasive, cognitive & other interventions (nec)	2,185,465	63.7	5,924,908	2.7	5.7
1940–2016	Imaging services	128,584	22.6	1,009,988	7.9	9.9
	No procedure or not reported	212,731	36.7	704,068	3.3	4.6
Total[(b)]		**2,845,907**	**64.2**	**7,337,627**	**2.6**	**5.4**

(a) Separations for which the care type was reported as Newborn with no qualified days and records for *Hospital boarders* and *Posthumous organ procurement* have been excluded.

(b) As more than one procedure can be reported for each separation, the totals are not the sums of the rows of the table.

Note: ALOS = average length of stay; nec = not elsewhere classified.

Source: AIHW National Hospital Morbidity Database.

Table S34: Separation statistics[a], by Major Diagnostic Category (based on AR-DRGs version 5.0), public hospitals, 2005–06

Major Diagnostic Category[b]		Separations	Per cent same-day separations	Patient days	ALOS (days)	ALOS (days) excluding same-day	Estimated cost ($000)[c]
01	Nervous system	210,244	36.4	1,029,802	4.9	7.1	974,338
02	Eye diseases and disorders	86,364	82.1	115,020	1.3	2.9	199,803
03	Ear, nose, mouth and throat	170,468	47.6	278,817	1.6	2.2	372,903
04	Respiratory system	240,935	16.0	1,165,014	4.8	5.6	1,040,594
05	Circulatory system	368,647	26.8	1,366,863	3.7	4.7	1,671,279
06	Digestive system	445,936	46.7	1,187,915	2.7	4.1	1,297,164
07	Hepatobiliary system and pancreas	81,834	20.3	343,154	4.2	5.0	401,486
08	Musculoskeletal system and connective tissue	333,236	37.1	1,379,741	4.1	6.0	1,738,128
09	Skin, subcutaneous tissue and breast	164,856	50.2	489,140	3.0	5.0	475,407
10	Endocrine, nutritional and metabolic	62,776	27.5	315,714	5.0	6.6	308,713
11	Kidney and urinary tract	873,688	90.4	1,205,336	1.4	5.0	825,351
12	Male reproductive system	44,314	54.1	102,966	2.3	3.9	130,168
13	Female reproductive system	113,953	61.7	215,286	1.9	3.3	330,131
14	Pregnancy, childbirth and puerperium	346,887	27.0	923,124	2.7	3.3	1,132,629
15	Newborns and other neonates	55,840	12.0	469,138	8.4	9.4	451,871
16	Blood-forming organs, immunological disorders	70,672	65.9	166,218	2.4	5.0	154,388
17	Neoplastic disorders	177,170	88.7	320,525	1.8	8.2	351,693
18	Infectious and parasitic diseases	54,849	19.8	286,232	5.2	6.3	280,826
19	Mental diseases and disorders	129,298	26.6	1,358,399	10.5	14.0	685,039
20	Alcohol/drug use and disorders	33,007	25.9	129,662	3.9	5.0	78,827
21	Injuries, poisoning and toxic effects of drugs	131,287	39.3	377,718	2.9	4.1	423,270
22	Burns	6,917	33.2	37,925	5.5	7.7	56,378
23	Factors influencing health status, other contacts	117,928	72.1	278,704	2.4	5.9	217,257
ED	Error DRG[d]	6,363	23.2	75,010	11.8	15.0	70,908
PR	Pre-MDC[e]	12,031	3.1	339,123	28.2	29.0	823,793
Total		**4,339,500**	**50.6**	**13,956,546**	**3.2**	**5.5**	**14,492,343**

(a) Separations for acute and unspecified episodes of care or care for newborns with qualified patient days.

(b) Major Diagnostic Categories (MDCs) are groupings of AR-DRGs within the AR-DRG classification.

(c) The estimated total hospital cost is the sum of the estimated costs for each AR-DRG within the MDC, calculated using the estimated average cost for each AR-DRG (version 5.0) in public hospitals in 2003–04.

(d) Separations in the 'Error DRG' grouping did not have a valid AR-DRG.

(e) 'Pre-MDC' is a group of particularly resource-intensive AR-DRGs such as transplants.

Note: ALOS = average length of stay; MDC = Major Diagnostic Category; AR-DRG = Australian Refined Diagnosis Related Group.

Source: AIHW National Hospital Morbidity Database.

Table S35: Separation statistics[(a)], by Major Diagnostic Category (based on AR-DRGs version 5.0), private hospitals, 2005–06

Major Diagnostic Category[(b)]		Separations	Per cent same-day separations	Patient days	ALOS (days)	ALOS (days) excluding same-day
01	Nervous system	59,658	44.9	274,229	4.6	7.5
02	Eye diseases and disorders	161,579	91.1	167,784	1.0	1.4
03	Ear, nose, mouth and throat	186,043	69.6	221,253	1.2	1.6
04	Respiratory system	80,069	7.9	366,812	4.6	4.9
05	Circulatory system	151,643	24.6	576,210	3.8	4.7
06	Digestive system	467,982	76.8	816,299	1.7	4.2
07	Hepatobiliary system and pancreas	32,647	10.5	113,650	3.5	3.8
08	Musculoskeletal system and connective tissue	294,981	40.9	996,016	3.4	5.0
09	Skin, subcutaneous tissue and breast	164,055	68.8	319,550	1.9	4.0
10	Endocrine, nutritional and metabolic	31,307	29.1	112,418	3.6	4.7
11	Kidney and urinary tract	233,820	84.3	347,307	1.5	4.1
12	Male reproductive system	58,211	60.0	125,623	2.2	3.9
13	Female reproductive system	139,497	71.2	239,784	1.7	3.5
14	Pregnancy, childbirth and puerperium	145,141	36.3	473,387	3.3	4.5
15	Newborns and other neonates	13,669	12.9	87,965	6.4	7.2
16	Blood-forming organs, immunological disorders	30,170	73.9	56,590	1.9	4.4
17	Neoplastic disorders	189,696	93.6	254,224	1.3	6.3
18	Infectious and parasitic diseases	12,433	13.4	80,027	6.4	7.3
19	Mental diseases and disorders	101,301	76.2	485,893	4.8	17.0
20	Alcohol/drug use and disorders	19,014	72.2	83,916	4.4	13.3
21	Injuries, poisoning and toxic effects of drugs	20,021	34.0	68,727	3.4	4.7
22	Burns	302	23.2	1,604	5.3	6.6
23	Factors influencing health status, other contacts	140,711	90.5	193,294	1.4	4.9
ED	Error DRG[(c)]	6,557	53.1	32,031	4.9	9.3
PR	Pre-MDC[(d)]	1,494	1.0	45,238	30.3	30.6
Total		**2,742,001**	**64.5**	**6,539,831**	**2.4**	**4.9**

(a) Separations for which care type was reported as *Acute*, or *Newborn* with qualified patient-days, or was *Not reported*.

(b) Major Diagnostic Categories (MDCs) are groupings of AR-DRGs within the AR-DRG classification.

(c) Separations in the 'Error DRG' grouping did not have a valid AR-DRG.

(d) 'Pre-MDC' is a group of particularly resource-intensive AR-DRGs such as transplants.

Note: ALOS = average length of stay; MDC = Major Diagnostic Category; AR-DRG = Australian Refined Diagnosis Related Group.

Source: AIHW National Hospital Morbidity Database.

Table S36: Top 15 medications used in the community[(a)], by defined daily dose and volume, 2001–02 and 2005–06

	2001–02				2005–06				Per cent difference 2001–02 to 2005–06			
	DDD		Volume ('000)		DDD		Volume ('000)		DDD		Volume ('000)	
Generic name	PBS/ RPBS	Total	PBS/ RPBS	Total	PBS/ RPBS	Total	PBS/ RPBS	Total	PBS/ RPBS	Total	PBS/ RPBS	Total
Atorvastatin	54.6	54.7	5,514	5,521	115.6	115.8	9,048	9,068	111.5	111.6	64.1	64.3
Simvastatin	37.7	37.7	5,140	5,144	58.4	58.5	6,357	6,371	54.9	55.0	23.7	23.9
Amoxycillin	2.6	4.8	2,443	4,666	2.7	5.3	2,424	4,970	3.9	11.8	–0.8	6.5
Paracetamol	10.8	11.0	4,853	4,958	14.1	14.6	4,207	4,360	30.9	32.6	–13.3	–12.1
Omeprazole	21.1	21.2	4,163	4,174	19.4	19.5	4,183	4,204	–8.0	–7.9	0.5	0.7
Atenolol	8.8	11.3	2,828	3,610	9.9	12.7	3,260	4,179	11.9	12.3	15.3	15.7
Salbutamol	22.2	30.1	3,593	4,724	18.0	25.4	2,944	4,076	–18.8	–15.4	–18.1	–13.7
Codeine with paracetamol	. .	. .	2,933	4,089	. .	. .	2,607	4,027	. .	. .	–11.1	–1.5
Perindopril[(b)]	9.4	9.8	n.a.	2,403	14.8	17.5	3,125	3,881	58.0	79.1	. .	61.5
Irbesartan	16.0	16.0	2,718	2,721	17.9	22.3	3,026	3,866	12.0	39.7	11.3	42.1
Cefalexin	1.2	1.9	1,800	3,008	1.4	2.4	2,202	3,822	20.0	24.5	22.3	27.0
Esomeprazole[(b)]	1.7	1.7	. .	387	14.2	14.2	3,717	3,724	. .	. .	. .	. .
Ramipril[(b)]	19.8	20.3	. .	2,163	35.7	38.9	3,025	3,462	80.0	92.0	. .	60.1
Metformin hydrochloride	8.7	10.5	2,184	2,642	11.8	14.8	2,727	3,400	36.3	40.8	24.9	28.7
Irbesartan[(b)] with hydrochlorothiazide	13.7	13.7	. .	1,866	. .	. .	2,963	3,190	. .	. .	. .	70.9

(a) Medications included here are those for which a prescription is written and supplied in community pharmacies. Hospital pharmaceuticals and over-the-counter medications supplied without prescription are not included.

(b) 2002–03 data derived from the calendar years 2001 and 2002.

. . Not applicable/not available.

Notes

1. DDD = defined daily dose per thousand population per day; PBS = Pharmaceutical Benefits Scheme; RPBS = Repatriation Pharmaceutical Benefits Scheme.
2. Esomeprazole was first listed in 2001.

Source: DoHA Drug Utilisation Sub-Committee (DUSC) database (DoHA unpublished data).

Use of professional services

Table S37: Medical and optometry services, fees and benefits under Medicare, 2002–03 to 2006–07

Service/year	Number of services (million)	Fees charged ($ million)	Schedule fees ($ million)	Benefits paid ($ million)
GP attendances[(a)]				
2002–03	96.9	3,150.8	3,255.0	2,766.2
2003–04	97.5	3,299.1	3,355.3	2,854.8
2004–05	100.9	3,723.8	3,579.5	3,321.4
2005–06	104.3	4,243.0	3,827.6	3,848.6
2006–07	107.1	4,497.2	4,055.3	4,068.5
Specialist attendances				
2002–03	20.1	1,482.9	1,285.0	1,076.6
2003–04	20.3	1,572.7	1,331.3	1,119.5
2004–05	20.8	1,681.6	1,391.6	1,211.9
2005–06	21.3	1,792.3	1,455.8	1,270.8
2006–07	21.7	1,911.2	1,526.7	1,320.4
Obstetrics				
2002–03	1.4	159.1	90.9	72.1
2003–04	1.4	171.0	93.1	76.6
2004–05	1.4	253.9	101.9	141.6
2005–06	1.4	283.6	111.4	163.2
2006–07	1.5	324.2	122.1	185.1
Anaesthetics				
2002–03	1.9	430.2	272.7	205.9
2003–04	1.9	459.1	275.3	207.9
2004–05	2.0	495.7	288.6	218.5
2005–06	2.1	550.4	316.6	239.6
2006–07	2.2	601.4	341.1	258.0
Pathology				
2002–03	70.5	1,422.5	1,562.2	1,312.0
2003–04	73.8	1,528.7	1,675.3	1,407.5
2004–05	77.7	1,644.3	1,805.0	1,521.9
2005–06	82.9	1,764.7	1,944.0	1,641.8
2006–07	87.5	1,872.9	2,062.7	1,741.6

(continued)

Table S37 (continued): Medical and optometry services, fees and benefits under Medicare, 2002–03 to 2006–07

Service/year	Number of services (million)	Fees charged ($ million)	Schedule fees ($ million)	Benefits paid ($ million)
Diagnostic imaging				
2002–03	13.2	1,523.7	1,502.6	1,278.2
2003–04	13.5	1,607.0	1,562.0	1,330.5
2004–05	14.1	1,772.2	1,716.7	1,483.0
2005–06	14.9	1,930.6	1,862.9	1,609.4
2006–07	15.7	2,076.0	1,993.1	1,714.0
Operations				
2002–03	6.3	1,327.4	1,010.5	792.5
2003–04	6.6	1,437.7	1,068.5	839.9
2004–05	6.9	1,569.4	1,141.4	907.2
2005–06	7.1	1,705.0	1,215.0	967.4
2006–07	7.2	1,843.5	1,283.7	1,022.4
Optometry				
2002–03	4.6	184.1	214.4	182.3
2003–04	4.8	198.3	231.0	196.5
2004–05	5.1	217.5	253.5	215.7
2005–06	5.3	227.7	265.4	225.8
2006–07	5.5	241.7	282.0	239.8
All other services[b]				
2002–03	6.4	565.0	514.0	429.7
2003–04	6.6	722.7	669.2	566.7
2004–05	7.3	1,064.6	1,008.4	901.7
2005–06	8.0	1,194.3	1,126.9	1,009.6
2006–07	9.5	1,414.0	1,318.2	1,185.8
Total services				
2002–03	221.4	10,245.6	9,707.2	8,115.5
2003–04	226.4	10,996,4	10,261.0	8,600.0
2004–05	236.3	12,423.0	11,286.7	9,922.9
2005–06	247.4	13,691.5	12,125.6	10,976.3
2006–07	257.9	14,782.1	12,984.8	11,735.6

(a) GP attendances include practice nurse items from 2003–04 onwards.

(b) Includes radiotherapy and nuclear medicine therapy, assistance at operations and other miscellaneous services, and from 2004–05 allied health services.

Source: DoHA 2007.

Table S38: Medicare services, age-specific rates, 1986–87 to 2006–07 (services per person)

Sex/age group	1986–87	1991–92	2001–02	2004–05	2005–06	2006–07
Males						
0–4	7.83	8.85	8.56	8.44	8.46	8.49
5–9	4.41	4.99	4.61	4.19	4.35	4.26
10–14	3.71	4.22	4.16	3.78	3.96	3.98
15–19	3.71	4.38	4.55	4.24	4.42	4.50
20–24	4.20	4.57	4.89	4.50	4.63	4.70
25–34	4.58	5.12	5.59	5.40	5.56	5.63
35–44	5.31	5.99	7.23	7.11	7.26	7.42
45–54	7.13	7.65	10.05	10.05	10.28	10.57
55–64	9.59	11.66	14.88	15.56	15.93	16.32
65–74	10.92	12.53	23.17	25.09	25.71	26.06
75–84	15.42	16.99	20.32	26.91	29.19	31.36
85+	15.82	19.28	22.73	22.87	23.15	23.03
Crude rate	**6.18**	**7.10**	**9.17**	**9.59**	**9.94**	**10.23**
ASR[(a)]	**6.63**	**7.52**	**9.31**	**9.64**	**9.94**	**10.18**
Females						
0–4	7.08	8.06	7.82	7.67	7.69	7.70
5–9	4.35	4.98	4.59	4.14	4.28	4.19
10–14	3.90	4.38	4.20	3.86	4.06	4.09
15–19	6.55	7.62	8.03	7.57	7.85	8.05
20–24	9.93	10.19	10.97	10.31	10.60	10.92
25–34	10.87	11.35	13.15	12.98	13.45	13.68
35–44	9.15	10.34	12.40	12.42	12.81	13.26
45–54	10.37	11.70	14.61	14.39	14.62	15.02
55–64	11.98	13.80	17.94	18.41	18.72	19.13
65–74	14.75	16.42	23.23	25.06	25.62	26.08
75–84	18.06	20.11	25.36	28.01	29.24	30.30
85+	19.02	21.32	25.94	27.29	27.76	27.99
Crude rate	**9.63**	**10.79**	**13.28**	**13.54**	**13.94**	**14.31**
ASR[(a)]	**9.78**	**10.85**	**13.01**	**13.12**	**13.47**	**13.78**

(a) Age-standardised rate. Age-standardised to the Australian population as at 30 June 2001.

Source: DoHA 2007.

Table S39: Medicare services, states and territories, 2006–07

Broad type of service	NSW	Vic	Qld	WA	SA	TAS	ACT	NT	Aust
					Services (million)				
Non-referred medical attendances[(a)]	37.4	25.6	19.7	8.7	8.0	2.2	1.3	0.5	103.4
Practice nurse	1.0	0.7	1.0	0.4	0.3	0.1	0.0	0.0	3.7
Optometry	1.8	1.3	1.2	0.5	0.4	0.1	0.1	0.0	5.5
Other allied health	0.6	0.5	0.3	0.1	0.1	0.0	0.0	0.0	1.6
Total non-specialist items	*40.8*	*28.1*	*22.2*	*9.7*	*8.8*	*2.5*	*1.5*	*0.6*	*114.1*
Specialist attendances	7.8	5.9	3.6	1.6	1.8	0.5	0.3	0.1	21.7
Obstetrics	0.5	0.4	0.3	0.2	0.1	0.0	0.0	0.0	1.5
Anaesthetics	0.7	0.6	0.5	0.2	0.2	0.0	0.0	0.0	2.2
Pathology	30.8	21.5	17.4	7.9	6.1	1.8	1.2	0.7	87.5
Diagnostic imaging	5.8	3.9	2.9	1.4	1.1	0.3	0.2	0.1	15.7
Operations	2.6	1.4	1.8	0.7	0.5	0.1	0.1	0.0	7.2
Assistance at operations	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.4
Radiotherapy and therapeutic nuclear medicine	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.9
Total specialist items[(b)]	*48.6*	*34.1*	*26.7*	*12.1*	*10.0*	*2.8*	*1.9*	*0.9*	*137.0*
Miscellaneous	2.5	1.7	1.2	0.5	0.5	0.1	0.1	0.0	6.7
Total	**91.9**	**63.9**	**50.1**	**22.3**	**19.3**	**5.5**	**3.4**	**1.5**	**257.9**
					Services per person				
Non-referred medical attendances[(a)]	5.4	4.9	4.7	4.1	5.1	4.5	3.9	2.5	4.9
Practice nurse	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.2
Optometry	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.3
Other allied health	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
Total non-specialist items	*5.9*	*5.4*	*5.3*	*4.6*	*5.6*	*5.1*	*4.3*	*2.9*	*5.4*
Specialist attendances	1.1	1.1	0.9	0.8	1.2	0.9	0.8	0.4	1.0
Obstetrics	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
Anaesthetics	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
Pathology	4.5	4.1	4.2	3.8	3.9	3.7	3.7	3.0	4.2
Diagnostic imaging	0.8	0.8	0.7	0.6	0.7	0.7	0.6	0.3	0.7
Operations	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.3
Assistance at operations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Radiotherapy and therapeutic nuclear medicine	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total specialist items[(b)]	*7.0*	*6.6*	*6.4*	*5.8*	*6.3*	*5.8*	*5.5*	*4.0*	*6.5*
Miscellaneous	0.4	0.3	0.3	0.2	0.3	0.3	0.2	0.1	0.3
Total	**13.3**	**12.3**	**12.0**	**10.6**	**12.2**	**11.2**	**10.0**	**6.9**	**12.3**

(a) Includes GP attendances, emergency attendances, attendances after hours, other prolonged attendances, group therapy and acupuncture.

(b) Excludes dental services covered by Medicare.

Source: DoHA 2007.

Table S40: Medicare services, percentage of enrolled persons by number of services, 2005–06

	Number of services						
Sex/age group	**0**	**1**	**2**	**3**	**4**	**5 or more**	**Total**
Males							
0–4	8.1	8.1	8.7	8.4	8.0	58.8	100.0
5–14	20.8	16.0	12.9	10.1	7.9	32.2	100.0
15–24	24.3	15.3	11.3	8.4	6.6	34.1	100.0
25–34	26.2	13.9	9.8	7.3	5.9	36.9	100.0
35–44	22.3	12.3	8.7	6.5	5.4	45.0	100.0
45–54	15.8	9.8	7.0	5.2	4.6	57.6	100.0
55–64	10.8	5.8	4.4	3.5	3.4	72.2	100.0
65–74	6.1	2.5	2.2	2.0	2.0	85.2	100.0
75–84	12.9	2.1	1.9	1.5	1.8	79.8	100.0
85 and over	26.1	3.2	2.9	2.0	2.4	63.3	100.0
Females							
0–4	9.2	9.2	9.5	8.9	8.3	55.0	100.0
5–14	21.0	16.4	13.1	10.1	7.8	31.6	100.0
15–24	11.0	9.4	8.3	7.0	6.2	58.1	100.0
25–34	10.1	6.2	5.4	5.0	4.8	68.4	100.0
35–44	10.2	6.6	5.4	5.3	5.0	67.5	100.0
45–54	7.9	5.7	4.6	4.4	4.2	73.2	100.0
55–64	5.7	3.7	3.2	3.1	3.1	81.2	100.0
65–74	4.4	1.8	1.8	1.8	1.9	88.3	100.0
75–84	9.5	1.6	1.7	1.5	1.8	83.9	100.0
85 and over	12.3	1.9	2.0	1.7	2.1	80.0	100.0

Source: Medicare Australia 2007.

Table S41: Australian Government receipts from the Medicare levy and total taxation revenue, current prices, selected years, 1984–85 to 2005–06 ($ million)

Revenue type	1984–85	1990–91	1995–96	2000–01	2004–05	2005–06
Medicare levy	1,223	2,480	3,350	4,605	6,105	6,525
Total taxation revenue	52,970	92,739	115,700	146,698	188,176	203,918
Medicare levy as a proportion of total taxation revenue	2.3%	2.7%	2.9%	3.1%	3.2%	3.2%
Medicare levy as a proportion of Australian Government recurrent health expenditure	19.0%	22.1%	20.1%	18.1%	17.5%	17.8%

Sources: Australian Government Budget Paper No.1, various years including 2007–08; AIHW Health Expenditure Database.

Table S42: Health-related taxation expenditure[(a)], current and constant[(b)] prices, 1995–96 to 2005–06 ($ million)

Year	Current prices	Constant prices
1995–96	91	121
1996–97	113	149
1997–98	128	166
1998–99	145	182
1999–00	162	199
2000–01	173	205
2001–02	203	231
2002–03	225	245
2003–04	251	262
2004–05	290	290
2005–06	329	315

(a) Comprises the medical expenses tax rebate. For example, for the 2005–06 income year, the tax rebate was 20 cents for each $1 by which a taxpayer's net medical expenses exceeded $1,500 (the threshold).

(b) See Box 8.2 for explanation of constant price estimating method.

Source: AIHW Health Expenditure Database.

Table S43: Total health expenditure, by area of expenditure and source of funds[(a)], current prices, 2004–05 ($ million)

	Government sector			Non-government sector				
Area of expenditure	**Australian Govern-ment**	**State and local**	**Total**	**Health insurance funds**	**Indiv-iduals**	**Other[(b)]**	**Total**	**Total all sectors**
Total hospitals	12,060	11,121	23,181	3,351	469	1,418	5,237	28,418
Public hospital services[(c)]	9,735	10,896	20,631	385	228	848	1,460	22,091
Private hospitals	2,324	225	2,550	2,966	241	570	3,777	6,327
Patient transport services	163	893	1,056	94	189	75	357	1,413
Total institutional	*12,223*	*12,014*	*24,237*	*3,445*	*657*	*1,493*	*5,595*	*29,831*
Medical services	11,589	—	11,589	591	1,622	844	3,057	14,646
Dental services	423	500	923	729	3,403	9	4,141	5,064
State/territory provider	. .	500	500	. .	14	. .	14	513
Private provider	423	. .	423	729	3,389	9	4,127	4,550
Other health practitioners	641	—	641	359	1,508	285	2,151	2,792
Community health and other[(d)]	408	2,855	3,262	—	116	172	288	3,551
Public health	866	519	1,386	—	55	—	55	1,440
Medications	6,051	—	6,051	51	5,007	57	5,115	11,166
Benefit-paid pharmaceuticals	5,930	—	5,930	—	1,151	—	1,151	7,081
All other medications	121	—	121	51	3,856	57	3,964	4,085
Aids and appliances	376	—	376	256	1,941	37	2,234	2,610
Health administration	1,265	509	1,774	607	—	—	607	2,382
Research	1,133	208	1,341	—	—	374	374	1,715
Total non-institutional	*22,752*	*4,590*	*27,342*	*2,593*	*13,652*	*1,777*	*18,023*	*45,365*
Total recurrent expenditure	**34,975**	**16,604**	**51,579**	**6,038**	**14,309**	**3,270**	**23,617**	**75,196**
Capital expenditure	191	1,571	1,763	n.a.	n.a.	2,906	2,906	4,669
Capital consumption	98	1,162	1,260	. .	. .	. .	[(e)] . .	1,260
Total health expenditure[(f)]	**35,264**	**19,337**	**54,601**	**6,038**	**14,309**	**6,176**	**26,523**	**81,125**
Non-specific tax expenditure	290	. .	290	. .	–290	. .	–290	. .
Total health expenditure	**35,554**	**19,337**	**54,891**	**6,038**	**14,019**	**6,176**	**26,233**	**81,125**

(a) This table shows funding provided by the Australian Government, state and territory governments, local government authorities and the major non-government sources of funding for health care. It does not show gross outlays on health goods and services by the different service provider sectors.

(b) 'Other' includes expenditure on health goods and services by workers' compensation and compulsory motor vehicle third party insurers as well as other sources of income (e.g. interest earned) of service providers.

(c) Public hospital services exclude any dental services, community health services, patient transport services, public health and health research undertaken by the hospital. Can include services provided off the hospital site such as hospital in the home dialysis or other services.

(d) 'Other' denotes 'other non-institutional n.e.c.'.

(e) Non-government capital consumption (depreciation) is incorporated in recurrent expenditure.

(f) Not adjusted for the funding of non-specific tax expenditure.

Note: Some components may not add to totals due to rounding.

Source: AIHW Health Expenditure Database.

Table S44: Total health expenditure, by area of expenditure and source of funds[(a)], current prices, 2005–06 ($ million)

Area of expenditure	Government sector: Australian Government	Government sector: State and local	Government sector: Total	Non-government sector: Health insurance funds	Non-government sector: Individuals	Non-government sector: Other[(b)]	Non-government sector: Total	Total all sectors
Total hospitals	12,612	12,618	25,230	3,462	667	1,642	5,772	31,003
Public hospital services[(c)]	10,105	12,374	22,479	409	386	1,046	1,840	24,319
Private hospitals	2,507	244	2,751	3,054	282	597	3,932	6,683
Patient transport services	165	899	1,064	92	209	74	375	1,439
Total institutional	*12,777*	*13,518*	*26,295*	*3,555*	*876*	*1,716*	*6,147*	*32,441*
Medical services	12,239	—	12,239	636	1,745	879	3,261	15,499
Dental services	480	515	995	760	3,573	10	4,342	5,337
State/territory provider	. .	515	515	. .	19	. .	19	534
Private provider	480	. .	480	760	3,554	10	4,323	4,804
Other health practitioners	711	—	711	384	1,653	288	2,324	3,035
Community health and other[(d)]	419	3,167	3,586	—	173	139	313	3,899
Public health	798	632	1,429	—	47	—	47	1,476
Medications	6,117	—	6,117	47	5,276	62	5,384	11,501
Benefit-paid pharmaceuticals	6,046	—	6,046	—	1,240	—	1,240	7,286
All other medications	71	—	71	47	4,036	62	4,144	4,216
Aids and appliances	409	—	409	264	2,072	42	2,378	2,787
Health administration	1,403	455	1,858	639	—	—	639	2,497
Research	1,275	229	1,504	—	—	412	412	1,915
Total non-institutional	*23,852*	*4,997*	*28,848*	*2,729*	*14,539*	*1,831*	*19,100*	*47,948*
Total recurrent expenditure	**36,629**	**18,514**	**55,143**	**6,284**	**15,415**	**3,547**	**25,246**	**80,389**
Capital expenditure	183	1,898	2,080	n.a.	n.a.	3,087	3,087	5,167
Capital consumption	88	1,234	1,323	. .	. .	. .	[(e)] . .	1,323
Total health expenditure[(f)]	**36,900**	**21,646**	**58,546**	**6,284**	**15,415**	**6,634**	**28,333**	**86,879**
Non-specific tax expenditure	329	. .	329	. .	–329	. .	–329	. .
Total health expenditure	**37,229**	**21,646**	**58,875**	**6,284**	**15,086**	**6,634**	**28,004**	**86,879**

(a) This table shows funding provided by the Australian Government, state and territory governments, local government authorities and the major non-government sources of funding for health care. It does not show gross outlays on health goods and services by the different service provider sectors.

(b) 'Other' includes expenditure on health goods and services by workers' compensation and compulsory motor vehicle third party insurers as well as other sources of income (e.g. interest earned) of service providers.

(c) Public hospital services exclude any dental services, community health services, patient transport services, public health and health research undertaken by the hospital. Can include services provided off the hospital site such as hospital in the home dialysis or other services.

(d) 'Other' denotes 'other non-institutional n.e.c.'.

(e) Non-government capital consumption (depreciation) is incorporated in recurrent expenditure.

(f) Not adjusted for the funding of non-specific tax expenditure.

Note: Some components may not add to totals due to rounding.

Source: AIHW Health Expenditure Database.

Table S45: Recurrent expenditure on health in current prices and average annual growth rates in constant prices[(a)], 1995–96 to 2005–06

	1995–96		2005–06		Average annual growth (%)		
Area of expenditure	**Amount ($m)**	**Proportion (%)**	**Amount ($m)**	**Proportion (%)**	**1995–96 to 2005–06**	**1995–96 to 2002–03**	**2003–04 to 2005–06**
Total hospitals	14,701	40.1	31,003	38.6	(b)	4.8	4.2
Public hospitals[(c)]/ Public hospital services[(d)]	11,518	31.4	24,319	30.3	(b)	4.6	4.9
Private hospitals	3,183	8.7	6,683	8.3	4.5	5.3	1.9
Patient transport services	653	1.8	1,439	1.8	(b)	2.5	1.3
Total institutional	*15,354*	*41.9*	*32,441*	*40.4*	*4.6*	4.7	*4.1*
Medical services	7,872	21.5	15,499	19.3	2.6	2.7	2.7
Dental services	2,373	6.5	5,337	6.6	(b)	4.2	1.9
State/territory provider	205	0.6	534	0.7	(b)	5.9	2.4
Private provider	2,169	5.9	4,804	6.0	(b)	4.0	1.8
Other health practitioners	1,350	3.7	3,035	3.8	(b)	3.1	3.1
Community health and other[(e)]	1,349	3.7	3,899	4.9	(b)	10.5	4.9
Public health	662	1.8	1,476	1.8	(b)	6.1	4.0
Medications	4,657	12.7	11,501	14.3	8.6	9.9	4.3
Benefit-paid pharmaceuticals	2,997	8.2	7,286	9.1	9.1	10.5	4.1
All other medications	1,660	4.5	4,216	5.2	7.7	9.0	4.8
Aids and appliances	1,088	3.0	2,787	3.5	(b)	10.4	6.7
Health administration	1,311	3.6	2,497	3.1	3.2	3.3	2.1
Research	638	1.7	1,915	2.4	8.0	8.4	9.1
Total non-institutional	*21,300*	*58.1*	*47,948*	*59.6*	*4.9*	5.6	*3.7*
Total recurrent expenditure	**36,654**	**100.0**	**80,389**	**100.0**	**4.8**	**5.2**	**3.8**

(a) See Box 8.2 for explanation of constant price estimating method.

(b) Average annual growth rate cannot be calculated due to a break in the series in 2002–03 (see below).

(c) Public hospitals (1995–96 to 2002–03) includes any dental services, community health services, patient transport services, public health and health research undertaken by the hospital. Can include services provided off the hospital site such as hospital in the home dialysis or other services.

(d) Public hospital services (2003–04 to 2005–06) excludes any dental services, community health services, patient transport services, public health and health research undertaken by the hospital. Can include services provided off the hospital site such as hospital in the home dialysis or other services.

(e) 'Other' denotes 'other non-institutional n.e.c.'.

Note: Some components may not add to totals due to rounding.

Source: AIHW Health Expenditure Database.

Table S46: Total health expenditure, current and constant prices[(a)], and annual growth rates, 1995–96 to 2005–06

	Amount ($ million)		Growth rate (per cent)	
Year	Current	Constant	Current	Constant
1995–96	39,047	50,948	. .	. .
1996–97	42,116	54,015	7.9	6.0
1997–98	44,802	56,266	6.4	4.2
1998–99	48,502	59,393	8.3	5.6
1999–00	52,442	62,786	8.1	5.7
2000–01	58,287	68,090	11.1	8.4
2001–02	63,448	70,802	8.9	4.0
2002–03	68,932	74,334	8.6	5.0
2003–04	73,945	77,036	7.3	3.6
2004–05	81,125	81,125	9.7	5.3
2005–06	86,879	83,601	7.1	3.1
Average annual growth rates				
1995–96 to 1997–98			7.1	5.1
1997–98 to 2002–03			9.0	5.7
1995–96 to 2005–06			8.3	5.1

(a) See Box 8.2 for explanation of constant price estimating method.

Source: AIHW Health Expenditure Database.

Table S47: Expenditure on health for Aboriginal and Torres Strait Islander peoples, by program, 2004–05

Program responsibility	Total expenditure ($m)	Per person expenditure ($)	Per cent of total
Through state and local government programs	1,537.1	3,148	66.7
Through Australian Government programs	604.7	1,238	26.2
Australian Government Health and Ageing portfolio programs	579.7	1,187	25.2
Medicare and PBS	197.0	403	8.5
Indigenous-specific programs	299.6	614	13.0
Other Health and Ageing portfolio programs	83.1	170	3.6
Department of Veterans' Affairs programs	11.4	23	0.5
RPBS	2.1	4	0.1
Other DVA programs	9.3	19	0.4
Other Australian Government research programs	13.6	28	0.6
Through non-government programs	162.2	332	7.0
Total	**2,304.0**	**4,718**	**100.0**

Source: AIHW Health Expenditure Database.

Table S48: Total public health expenditure by the Australian Government and state and territory governments, current prices, by activity, 2003–04 to 2005–06 ($ million)

	2003–04			2004–05			2005–06		
Activity	Australian Government[a]	States and territories[b]	Total	Australian Government[a]	States and territories[b]	Total	Australian Government[a]	States and territories[b]	Total
Communicable disease control	30.4	173.4	203.8	38.6	193.3	231.9	35.9	208.7	244.6
Selected health promotion	44.3	172.1	216.4	40.4	192.4	232.8	41.6	208.3	249.9
Organised immunisation	49.5	218.6	268.1	136.2	202.1	338.3	130.8	187.6	318.4
Environmental health	19.2	60.8	80.0	17.0	66.3	83.3	15.1	69.0	84.1
Food standards and hygiene	14.6	20.8	35.4	14.0	18.6	32.6	15.0	22.0	37.0
Breast cancer screening	1.7	106.7	108.4	2.0	116.3	118.3	1.9	137.2	139.1
Cervical screening	65.6	23.5	89.1	77.1	26.3	103.4	76.9	27.5	104.4
Prevention of hazardous and harmful drug use	52	115.9	167.9	68.0	126.2	194.2	27.5	148.4	175.9
Public health research	68.6	24.9	93.5	77.5	27.4	104.9	92.6	30.0	122.6
PHOFA administration[c]	0.3	—	0.3	0.3	—	0.3	0.3	—	0.3
Total expenditure	**346.2**	**916.7**	**1,262.9**	**471.1**	**969.0**	**1,440.1**	**437.6**	**1,038.8**	**1,476.4**
Proportion of total public health expenditure (%)	27.4	72.6	100.0	32.7	67.3	100.0	29.6	70.4	100.0

(a) Australian Government expenditure does not include its funding of state/territory expenditure through specific purpose payments to states and territories.

(b) Relates to activity-specific, program-wide and agency-wide expenditure incurred by state and territory governments, including expenditure that is wholly or partly funded through Australian Government specific purpose payments to states and territories.

(c) Relates to expenditure incurred by the Australian Government in administering funding under the Public Health Outcome Funding Agreements (PHOFAs).

Note: Components may not add to totals, due to rounding.

Source: AIHW Health Expenditure Database.

Table S49: Government health expenditure(a) as a proportion of total health expenditure and GDP, OECD countries, 1995 to 2005 (per cent)

Country	1995		2000		2005	
	Share of total health expenditure	Share of GDP	Share of total health expenditure	Share of GDP	Share of total health expenditure	Share of GDP
Greece	52.0	3.9	44.2	4.1	42.8	4.3
United States	45.3	6.0	43.7	5.8	45.1	6.9
Mexico	42.1	2.4	46.6	2.6	45.5	2.9
Korea, Republic of	35.7	1.5	46.8	2.2	53.0	3.2
Switzerland	53.8	5.2	55.6	5.8	59.7	6.9
Australia(b)	**66.0**	**4.9**	**67.0**	**5.5**	**67.0**	**5.9**
Poland	72.9	4.0	70.0	3.9	69.3	4.3
Canada	71.4	6.4	70.4	6.2	70.3	6.9
Spain	72.2	5.4	71.6	5.2	71.4	5.9
Turkey	70.3	2.4	62.9	4.2	71.4	5.4
Belgium	78.5	6.5	76.0	6.6	72.3	7.4
Portugal	62.6	4.9	72.5	6.4	72.7	7.4
Slovak Republic	. .	. .	89.4	4.9	74.4	5.3
Austria	71.5	7.0	75.9	7.6	75.7	7.7
Italy	70.8	5.1	72.5	5.8	76.6	6.8
Germany	81.6	8.2	79.7	8.2	76.9	8.2
Finland	75.6	5.6	75.1	4.9	77.8	5.9
Ireland	71.8	4.8	72.9	4.6	78.0	5.8
New Zealand	77.2	5.5	78.0	6.0	78.1	7.0
France	78.6	7.7	78.3	7.5	79.8	8.9
Iceland	83.9	6.9	82.0	7.6	82.5	7.9
Norway	84.2	6.6	82.5	6.9	83.6	7.6
Denmark	82.5	6.7	82.4	6.8	84.1	7.7
Sweden	86.6	7.0	84.9	7.1	84.6	7.7
United Kingdom	83.9	5.8	80.9	5.9	87.1	7.2
Czech Republic	90.9	6.4	90.3	5.9	88.6	6.4
Hungary	84.0	6.1	70.7	4.9	n.a.	n.a.
Japan	83.0	5.7	81.3	6.2	n.a.	n.a.
Luxembourg	92.4	5.1	89.3	5.2	n.a.	n.a.
Netherlands	71.0	5.9	63.1	5.0	n.a.	n.a.
Weighted average (28 countries)(c)(d)	**60.9**	**5.8**	**59.4**	**5.9**	**59.9**	**6.7**
Median (28 countries)(c)	**74.3**	**5.7**	**74.0**	**5.9**	**76.2**	**6.9**

(a) See OECD definition of health expenditure in Box 8.4.

(b) Expenditure based on the OECD SHA framework.

(c) The 28 countries included in the averages exclude the Slovak Republic and the Netherlands. Averages for 2005 incorporate 2004 data for Hungary, Japan and Luxembourg.

(d) Average weighted by total health expenditure or GDP.

Sources: AIHW Health Expenditure Database; OECD 2007.

Table S50: Components of growth in health expenditure[a], selected OECD countries, 1995 to 2005, (per cent)

Country	Nominal growth	Inflation: General	Inflation: Excess health	Inflation: Health	Real growth: Population component	Real growth: Utilisation component	Real growth: Total
Australia[b]	**8.2**	**2.8**	**0.3**	**3.1**	**1.2**	**3.7**	**5.0**
Canada	6.2	2.0	0.1	2.1	1.0	3.1	4.1
Denmark[c]	5.5	2.1	0.0	2.0	0.4	3.0	3.4
Finland	5.2	1.4	1.8	3.2	0.3	1.6	1.9
France	5.0	1.4	–0.1	1.4	0.5	3.0	3.6
Italy	6.3	2.8	0.4	3.2	0.2	2.8	3.0
Spain[c]	6.8	3.1	–0.2	2.9	0.6	3.2	3.8
Sweden[d]	6.0	1.3	2.0	3.4	0.2	2.4	2.6
Switzerland[e]	4.1	0.5	0.2	0.7	0.5	2.8	3.4
United States	6.9	2.0	1.2	3.2	1.1	2.5	3.6

(a) See OECD definition of health expenditure in Box 8.4.
(b) Expenditure based on the OECD SHA framework.
(c) 1995 to 2001.
(d) 1995 to 2002.
(e) 1995 to 2003.

Note: Some components may not add to totals due to calculation methods.

Sources: AIHW Health Expenditure Database; OECD 2007.

Table S51: Out-of-pocket health expenditure[(a)] per person, and as shares of total health expenditure and household final consumption expenditure[(b)], OECD countries, current prices, 1995 and 2005

	1995			2005		
Country	Per person out-of-pocket expenditure (A$)	Share of total health expenditure (%)	Share of total HFCE (%)	Per person out-of-pocket expenditure (A$)	Share of total health expenditure (%)	Share of total HFCE (%)
Switzerland	1,119	33.0	5.5	1,761	30.5	6.1
United States	725	15.0	2.9	1,162	13.1	2.9
Belgium	n.a.	n.a.	n.a.	994	21.2	4.2
Norway	380	15.2	2.5	943	15.7	3.5
Iceland	393	16.1	2.4	831	17.5	2.9
Austria	496	16.7	3.0	794	16.4	3.1
Australia[(c)]	**335**	**15.9**	**2.0**	**750**	**18.2**	**2.8**
Italy	549	26.6	3.3	709	20.3	3.1
Spain	371	23.5	3.0	697	22.4	3.2
Korea, Republic of	385	54.9	4.4	686	37.7	4.4
Canada	432	15.9	2.6	665	14.5	2.6
Portugal	n.a.	n.a.	n.a.	625	22.3	3.6
Denmark	396	16.3	2.6	614	14.3	2.7
Germany	286	9.8	1.8	595	13.1	2.4
Finland	387	20.5	3.1	573	17.8	2.7
Ireland	230	14.4	1.9	542	13.4	2.4
New Zealand	265	16.2	2.0	541	16.7	2.6
Mexico	288	56.2	4.8	477	51.2	4.8
Slovak Republic	. .	. .	. .	355	22.6	2.8
Netherlands	n.a.	n.a.	n.a.	345	n.a.	1.5
France	218	8.0	1.4	322	6.9	1.4
Poland	149	27.1	2.5	312	26.1	2.6
Czech Republic	110	9.1	1.3	222	10.9	1.6
Turkey	74	29.7	1.4	160	19.9	2.2
Greece	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Hungary	145	16.0	2.2	n.a.	n.a.	n.a.
Japan	313	15.3	1.9	n.a.	n.a.	n.a.
Luxembourg	166	6.2	0.8	n.a.	n.a.	n.a.
Sweden	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
United Kingdom	199	10.9	1.2	n.a.	n.a.	n.a.
Weighted average (23 countries)[(d)(e)]	**419**	**16.6**	**2.7**	**710**	**15.5**	**2.8**
Median (23 countries)[(d)]	**335**	**16.1**	**2.5**	**595**	**17.3**	**2.7**

(a) See OECD definition of health expenditure in Box 8.4.

(b) Total HFCE covers all goods and services, including health.

(c) Expenditure based on the OECD SHA framework.

(d) The 23 countries included in the averages exclude Belgium, Greece, Netherlands, Portugal, Slovak Republic, Sweden and the United Kingdom. Averages for 2005 incorporate 2004 data for Hungary, Japan and Luxembourg.

(e) Averages weighted by population for per person out-of-pocket expenditure and by health expenditure or HFCE for other categories.

Note: Expenditure converted to Australian dollar values using GDP purchasing power parities.

Sources: AIHW Health Expenditure Database; OECD 2007.

Table S52: Contributions income and direct health expenditure by private health insurance funds, Australia, constant prices(a), 1984–85 to 2005–06

Year	Contributions income ($ million)	Annual growth rate (%)	Benefits ($ million)	Annual growth rate (%)
1984–85	2,980	. .	2,463	. .
1985–86	3,232	8.5	2,871	16.6
1986–87	3,704	14.6	3,330	16.0
1987–88	4,037	9.0	3,610	8.4
1988–89	4,037	0.0	3,649	1.1
1989–90	4,160	3.0	3,838	5.2
1990–91	4,548	9.3	4,222	10.0
1991–92	5,109	12.4	4,481	6.1
1992–93	5,322	4.2	4,531	1.1
1993–94	5,374	1.0	4,648	2.6
1994–95	5,289	–1.6	4,738	1.9
1995–96	5,283	–0.1	4,903	3.5
1996–97	5,432	2.8	5,144	4.9
1997–98	5,740	5.7	5,043	–2.0
1998–99	5,996	4.4	5,171	2.6
1999–00	6,512	8.6	5,327	3.0
2000–01	8,112	24.6	6,041	13.4
2001–02	8,034	–1.0	6,945	15.0
2002–03	8,465	5.4	7,252	4.4
2003–04	8,975	6.0	7,576	4.5
2004–05	9,384	4.6	7,973	5.2
2005–06	9,797	4.4	8,115	1.8
Average annual growth rates				
1995–96 to 1997–98		4.2		1.4
1997–98 to 2002–03		8.1		7.5
1995–96 to 2005–06		6.4		5.2
1984–85 to 2005–06		5.8		5.8

(a) See Box 8.2 for explanation of constant price estimating method.

Sources: PHIAC annual reports.

Table S53: Expenditure on health goods and services funded through health insurance funds, current prices, 2003–04 to 2005–06 ($ million)

	2003–04			2004–05			2005–06		
Area of expenditure	**Gross benefits paid**	**Premium rebates[(a)]**	**Net benefits paid**	**Gross benefits paid**	**Premium rebates[(a)]**	**Net benefits paid**	**Gross benefits paid**	**Premium rebates[(a)]**	**Net benefits paid**
Expenditure									
Hospitals	4,572	1,384	3,186	4,919	1,569	3,351	5,213	1,750	3,462
Public hospital services[(b)]	486	147	339	565	180	385	615	207	409
Private hospitals	4,086	1,237	2,848	4,354	1,388	2,966	4,598	1,544	3,054
Patient transport[(c)]	130	39	91	138	44	94	139	47	92
Medical services	789	239	550	868	277	591	957	321	636
Dental services	1,027	311	716	1,070	341	729	1,144	384	760
Other health practitioners	499	151	348	527	168	359	578	194	384
Community and public health	1	—	1	1	—	—	1	—	—
Medications	71	21	49	75	24	49	71	24	47
Aids and appliances	367	111	256	376	120	256	397	133	264
Total health benefits and levies	**7,455**	**2,256**	**5,196**	**7,973**	**2,542**	**5,431**	**8,499**	**2,854**	**5,645**
Health administration	852	258	594	892	284	607	962	323	639
Direct expenditure on health goods and services	**8,307**	**2,514**	**5,790**	**8,865**	**2,827**	**6,038**	**9,461**	**3,177**	**6,284**
Items not included in estimates on health goods and services									
Non-health ancillaries	46	14	32	16	5	11	15	5	10
Outstanding claims adjustment	62	19	43	88	28	60	98	33	65

(a) The premium rebate is pro-rated across all categories (including change in provisions for outstanding claims). The rebate includes rebates paid through the tax system as well as rebates paid to funds which directly reduce premiums.

(b) Public hospital services excludes expenditure on dental services, community health services, patient transport services, public health and health research undertaken by the hospital. Can include services provided off the hospital site such as hospital in the home dialysis or other services.

(c) Includes the levy on private insurance funds in NSW and ACT to fund patient transport services.

Note: Components may not add to totals due to rounding.

Sources: PHIAC 2007; ATO 2006; DoHA 2004, 2005, 2006.

Table S54: Health insurance funds reported expenses and revenues, current prices, 2003–04 to 2005–06 ($ million)

Operating expenses and revenue of funds	2003–04	2004–05	2005–06
Expenses			
Total cost of benefits[(a)]	7,525	8,238	8,753
State levies (patient transport services)[(b)]	105	110	113
Management expenses	852	892	962
Total expenses (not including provision adjustments)	**8,482**	**9,240**	**9,828**
Revenue			
Contributions income[(b)]	8,637	9,384	10,261
Other revenue	296	373	446
Total revenue	**8,932**	**9,757**	**10,706**
Operating profit (loss) before abnormals and extraordinary items	447	626	984

(a) Includes adjustment to provisions for outstanding claims.

(b) An *Ambulance Service Levy* payable to the state or territory government by all private health insurance funds with members in NSW and ACT to offset cost of free emergency ambulance service provided to NSW and ACT residents who have hospital cover. This hospital cover (included under contributions income) includes a component to cover ambulance costs.

Note: Components may not add to totals due to rounding.

Sources: PHIAC annual reports.

Health workforce

Table S55: Employed medical practitioners by remoteness areas, 1997[(a)] and 2005

Type of practitioner	Major City	Inner Regional	Outer Regional	Remote/ Very Remote	Not stated	Total
			1997			
Clinicians	33,437	5,835	2,486	509	1,927	44,194
Primary care	14,206	3,425	1,574	357	572	20,134
Hospital non-specialist	3,190	419	228	84	401	4,321
Specialist	12,198	1,770	585	52	550	15,155
Specialist-in-training	3,843	221	99	16	404	4,584
Non-clinicians	3,344	290	133	32	206	4,004
Total	**36,780**	**6,125**	**2,619**	**541**	**2,133**	**48,198**
			2005			
Clinicians	43,105	7,638	2,986	644	1,710	56,084
Primary care	15,614	4,113	1,772	452	638	22,589
Hospital non-specialist	5,273	752	276	102	229	6,632
Specialist	16,180	2,305	749	74	635	19,943
Specialist-in-training	6,038	467	189	17	209	6,920
Non-clinicians	3,475	344	189	67	93	4,168
Total	**46,579**	**7,982**	**3,175**	**712**	**1,803**	**60,252**

(a) 1997 is the earliest year for which comparable estimates to 2005 are available, due to changes in estimation processes.

Sources: AIHW Medical Labour Force Surveys, 1997 and 2005.

Table S56: Employed medical practitioners: FTE rate[(a)] by remoteness areas, 1997[(b)] and 2005

Type of practitioner	Major City	Inner Regional	Outer Regional	Remote/ Very Remote	Total[(c)]
			1997		
Clinicians	290	167	141	116	255
Primary care	112	94	88	80	108
Hospital non-specialist	29	12	13	20	26
Specialist	110	53	34	12	91
Specialist-in-training	37	7	6	4	30
Non-clinicians	26	7	7	7	20
Total	**315**	**174**	**148**	**123**	**275**
			2005		
Clinicians	311	174	145	133	268
Primary care	100	88	84	92	98
Hospital non-specialist	40	18	13	22	33
Specialist	122	56	38	16	99
Specialist-in-training	49	12	10	4	37
Non-clinicians	24	7	8	14	19
Total	**335**	**181**	**153**	**148**	**287**

(a) Based on a standard full-time working week of 45 hours.

(b) 1997 is the earliest year for which comparable estimates to 2005 are available, due to changes in estimation processes.

(c) Includes medical practitioners who did not provide information on their main job location.

Sources: AIHW Medical Labour Force Surveys, 1997 and 2005.

Table S57: Employed medical practitioners: number and FTE rate[(a)], states and territories, 1997[(b)], 2001 and 2005

Measure	NSW	Vic	Qld[(c)]	WA[(c)]	SA	Tas[(d)]	ACT	NT[(e)]	Total
					1997				
Number	17,026	11,911	8,024	4,385	4,256	1,158	976	462	48,198
FTE rate	292	276	247	249	303	253	324	258	275
					2001				
Number	18,677	14,147	8,453	4,529	4,586	1,212	1,131	647	53,384
FTE rate	289	297	238	237	302	247	353	331	277
					2005				
Number	21,730	15,831	9,352	4,881	4,938	1,438	1,363	719	60,252
FTE rate	319	304	227	223	302	268	393	337	287

(a) Based on a standard full-time working week of 45 hours.

(b) 1997 is the earliest year for which comparable estimates to 2005 are available, due to changes in estimation processes.

(c) Estimates are of general registrants only and will therefore be an underestimate of total number of employed medical practitioners.

(d) Estimates are of general registrants and conditionally registered specialists and therefore will be an underestimate of total number of employed medical practitioners.

(e) Estimates for 2005 are based on responses to the 2004 Medical labour force survey benchmarked to 2005 registration figures.

Sources: Medical Labour Force Surveys 1997, 2001 and 2005.

Table S58: Employed registered and enrolled nurses: number by remoteness areas, 1997[(a)] and 2005

Type of nurse	Major City	Inner Regional	Outer Regional	Remote	Very Remote	Not stated	Total
				1997			
Registered	105,653	32,606	14,141	2,400	1,365	20,052	176,217
Enrolled	21,910	11,316	5,952	1,018	367	5,747	46,311
Total	**127,563**	**43,922**	**20,093**	**3,419**	**1,732**	**25,799**	**222,528**
				2005			
Registered	128,953	39,864	18,156	2,635	1,548	7,160	198,315
Enrolled	23,937	11,747	6,501	908	388	2,564	46,044
Total	**152,889**	**51,610**	**24,657**	**3,543**	**1,936**	**9,725**	**244,360**

(a) 1997 is the earliest year for which comparable estimates to 2005 are available, due to changes in estimation processes.

Sources: AIHW Nursing Labour Force Survey 1997; AIHW Nursing Labour Force Census 2005.

Table S59: Employed registered and enrolled nurses: FTE rate[(a)] by remoteness areas, 1997[(b)] and 2005

Type of nurse	Major City	Inner Regional	Outer Regional	Remote	Very Remote	Total[(c)]
			1997			
Registered	772	736	629	676	779	843
Enrolled	152	242	250	262	191	209
Total	**926**	**975**	**879**	**939**	**971**	**1,054**
			2005			
Registered	912	866	849	827	963	928
Enrolled	162	242	288	255	213	204
Total	**1,074**	**1,107**	**1,139**	**1,081**	**1,177**	**1,133**

(a) Based on a standard full-time working week of 35 hours.

(b) 1997 is the earliest year for which comparable estimates to 2005 are available, due to changes in estimation processes.

(c) Includes nurses who did not provide information on their main job location.

Sources: AIHW Nursing Labour Force Survey 1997; AIHW Nursing Labour Force Census 2005.

Table S60: Employed registered and enrolled nurses: states and territories, 1997[a], 2001 and 2005

Type of nurse	NSW	Vic[b]	Qld	WA[c]	SA	Tas	ACT	NT[d]	Total
					1997				
Registered	57,508	45,913	30,312	17,177	15,636	4,934	2,853	1,883	176,217
Enrolled	12,888	15,575	6,488	4,580	4,830	1,068	535	347	46,311
Total	**70,397**	**61,488**	**36,800**	**21,757**	**20,466**	**6,002**	**3,388**	**2,230**	**222,528**
					2001				
Registered	58,537	48,623	32,805	17,364	16,174	4,889	3,055	1,776	183,224
Enrolled	12,368	15,184	6,491	4,249	4,897	810	696	311	45,006
Total	**70,905**	**63,807**	**39,297**	**21,613**	**21,071**	**5,700**	**3,751**	**2,087**	**228,230**
					2005				
Registered	61,299	52,830	35,060	19,105	17,841	5,692	3,425	n.p.	198,315
Enrolled	11,876	16,206	6,313	3,800	5,810	953	683	n.p.	46,044
Total	**73,174**	**69,036**	**41,373**	**22,904**	**23,651**	**6,645**	**4,108**	**n.p.**	**244,360**

(a) 1997 is the earliest year for which comparable estimates to 2005 are available, due to changes in estimation processes.

(b) Estimates for Victoria for 2005 are derived from responses to 2006 AIHW Nursing and Midwifery Labour Force Survey, weighted to 2005 registration benchmark figures.

(c) Estimates for WA for 2005 are based on a response rate of 26.9% and should be treated with caution.

(d) Estimates for NT for 2005 are not separately published due to the very low response rate to the survey. Estimates for NT are, however, included in the Total estimates.

Sources: AIHW Nursing Labour Force Surveys 1997, 2001; AIHW Nursing Labour Force Census 2005.

Table S61: Employed registered and enrolled nurses: FTE rate[a] by states and territories, 1997[b], 2001 and 2005

Type of nurse	NSW	Vic[c]	Qld	WA[d]	SA	Tas	ACT	NT[e]	Total
					1997				
Registered	825	859	816	845	911	878	828	1,054	843
Enrolled	181	270	165	212	255	178	151	173	209
Total	**1,006**	**1,131**	**982**	**1,056**	**1,168**	**1,057**	**980**	**1,227**	**1,054**
					2001				
Registered	822	885	814	757	850	882	861	908	833
Enrolled	169	261	155	179	245	140	208	150	196
Total	**992**	**1,146**	**968**	**935**	**1,095**	**1,022**	**1,071**	**1,058**	**1,031**
					2005				
Registered	889	968	849	869	1,068	1,116	1,032	n.p.	928
Enrolled	165	279	149	167	332	181	210	n.p.	204
Total	**1,055**	**1,249**	**999**	**1,035**	**1,398**	**1,295**	**1,242**	**n.p.**	**1,133**

(a) Based on a standard full-time working week of 35 hours.

(b) 1997 is the earliest year for which comparable estimates to 2005 are available, due to changes in estimation processes.

(c) Estimates for Victoria for 2005 are derived from responses to 2006 AIHW Nursing and Midwifery Labour Force Survey, weighted to 2005 registration benchmark figures.

(d) Estimates for WA for 2005 are based on a response rate of 26.9% and should be treated with caution.

(e) Estimates for NT for 2005 are not separately published due to the very low response rate to the survey. Estimates for NT are, however, included in the Total estimates.

Sources: AIHW Nursing Labour Force Surveys 1997, 2001; AIHW Nursing Labour Force Census 2005.

Table S62: Employed dental labour force, states and territories, 2000 and 2003/05[(a)]

Type of practitioner	NSW[(b)]	Vic	Qld	WA	SA	Tas	ACT	NT	Total
					Number				
Dentists									
2000	3,126	2,204	1,564	913	821	119	184	60	8,991
2005	3,472	2,345	1,951	999	837	151	246	74	10,074
Dental therapists									
2000	216	140	361	331	128	50	16	19	1,260
2003[(a)]	195	153	354	314	128	61	22	16	1,242
Dental hygienists									
2000	58	79	45	82	110	. .	22	2	398
2003[(a)]	104	123	81	93	134	6	30	6	577
Dental prosthetists									
2000	304	260	117	60	27	52	16	. .	836
2003[(a)]	308	268	125	84	29	50	15	. .	795
					Number per 100,000 population				
Dentists									
2000	48.2	46.5	43.9	48.7	54.8	25.2	58.4	30.7	46.9
2005	51.3	46.7	49.1	49.7	54.3	31.2	75.5	36.3	49.5
Dental therapists									
2000	3.3	3.0	10.1	17.7	8.5	10.6	5.1	9.7	6.6
2003	2.9	3.1	9.3	16.1	8.4	12.8	6.8	8.1	6.2
Dental hygienists									
2000	0.9	1.7	1.3	4.4	7.3	. .	7.1	1.0	2.1
2003	1.5	2.5	2.1	4.8	8.8	1.3	9.2	3.2	2.9
Dental prosthetists									
2000	4.7	5.5	3.3	3.2	1.8	11.0	5.1	. .	4.4
2003	4.6	5.5	3.3	4.3	1.9	10.5	4.6	. .	4.5

(a) Data for allied dental practitioners was not available for 2005 and therefore 2003 data has been reported.

(b) As information for 2005 NSW was not available at the time of preparation estimates are based on the 2004 DLF survey, weighted to 2005 registration figures.

Notes

1. In 2003 there was no data collection in the NT and no collection of prosthetists in WA; results cited for these groups are based on data from the 2002 collection.
2. Dental prosthetists were not permitted to practise in the NT; consequently, the NT population was excluded in the calculations of practising prosthetists per 100,000 population.
3. In 2003 there were 71 dual registered dental therapists and hygienists in Australia; some of these are included in both the dental therapist and hygienist numbers.
4. In 2000 there was no data collection for dental therapists, hygienists and prosthetists; results cited for these groups are calculated by multiplying the total registered numbers by the 1997–98 labour force participation rates.
5. Dental hygienists were not permitted to practise in Tasmania until 2001.

Sources: AIHW DSRU Dental Labour Force data collection 2000, 2003 and 2005.

Table S63: Employed dental labour force, by remoteness area of main job, 2003 or 2005[a]

Type of practitioner	Major Cities	Inner Regional	Outer Regional	Remote/ Very Remote	Total[b]
			Number		
Dentists (2005[b])	7,889	1,488	591	100	10,074
Dental therapists (2003)	720	322	173	28	1,242
Dental hygienists (2003)	502	51	23	—	577
Dental prosthetists (2003)	542	194	53	5	794
			Number per 100,000		
Dentists (2005)	58.6	34.6	28.5	19.8	49.5
Dental therapists (2003)	5.5	7.8	8.5	5.6	6.2
Dental hygienist (2003)	3.8	1.2	1.1	0.0	2.9
Dental prosthetists (2003)	4.1	4.7	2.6	1.0	4.0

(a) Data for allied dental practitioners was not available for 2005 and therefore 2003 data have been reported.

(b) In 2005 no specialist dentists responded to the survey in the Northern Territory. According to the Dental Board there were 14 specialists registered in 2005. These have been added to the total but excluded from the regional figures.

Notes

1. Region is based on the main practice location.
2. In 2003 there was no data collection in the NT and no collection of prosthetists in WA; results cited are based on data from the 2002 collection.
3. Dental prosthetists were not permitted to practise in the NT; the NT population was excluded in the calculations of practising prosthetists per 100,000 population.
4. In 2003 there were 71 dual registered dental therapists and hygienists in Australia; some of these are included in both the dental therapist and hygienist numbers.

Sources: AIHW DSRU Dental Labour Force data collection 2003 and 2005.

References

ABS (Australian Bureau of Statistics)(various years). Population by age and sex. ABS cat. no. 3201.0. Canberra: ABS.

ABS (various years). Births, Australia. ABS cat. no. 3301.0. Canberra: ABS.

ABS (various years). Deaths, Australia. ABS cat. no. 3302.0. Canberra: ABS.

ABS (various years). Causes of death, Australia. ABS cat. no. 3303.0. Canberra: ABS.

ATO (Australian Taxation Office) 2006. 2005–06 Commissioner of Taxation annual report. Canberra: ATO.

Commonwealth of Australia 1986. 1986–87 Budget Paper No.1. Budget strategy and outlook 1986–87. Canberra: AG.

Commonwealth of Australia 2000. 2000–01 Budget Paper No.1. Budget strategy and outlook 2000–01. Canberra: AG.

Commonwealth of Australia 2001. 2001–02 Budget Paper No.1. Budget strategy and outlook 2001–02. Canberra: AG.

Commonwealth of Australia 2006. 2006–07 Budget Paper No.1. Budget strategy and outlook 2006–07. Canberra: AG.

Commonwealth of Australia 2007. 2007–08 Budget Paper No.1. Budget strategy and outlook 2007–08. Canberra: AG.

DoHA (Australian Government Department of Health and Ageing) 2004. Annual report 2003–04. Canberra: DoHA.

DoHA 2005. Annual report 2004–05. Canberra: DoHA.

DoHA 2006. Annual report 2005–06. Canberra: DoHA.

DoHA 2007. Medicare statistics, June quarter 2007. Canberra: DoHA.

Kenny D, Nelson P, Butler T, Lennings C, Allerton M & Champion U 2006. NSW young people on community orders health survey 2003–2006: Key findings report. Sydney: University of Sydney.

Medicare Australia 2007. Annual report 2006–07: statistical tables. Viewed 17 January 2008, <www.medicareaustralia.gov.au>.

NCHECR (National Centre in HIV Epidemiology and Clinical Research) 2007. HIV/AIDS, viral hepatitis and sexually transmissible infections in Australia: Annual surveillance report 2006. Sydney: NCHECR, University of New South Wales.

NNDSS (National Notifiable Diseases Surveillance System) 2008. Summary tables that include all diseases. Viewed 5 February 2008, <www.9health.gov.au/>.

OECD (Organisation for Economic Co-operation and Development) 2007. OECD health data 2007: statistics and indicators for 30 countries. Paris: OECD.

PHIAC (Private Health Insurance Administration Council)(various years). Annual report. Canberra: PHIAC.

PHIAC 2007. PHIAC A quarterly reports. Canberra. Viewed 4 November 2007, <www.phiac.gov.au>.

WHO (World Health Organization) 2007. WHO mortality database, table 1: number of registered deaths. WHO life tables. Viewed 9 August 2007, <www.who.int/whosis>.

Methods and conventions

Methods

Details of methods used in particular sections of the report are included in the text and boxes, and in footnotes to figures and tables. Entries in columns of tables may not add to the totals shown, because of rounding.

Age-standardisation has been used to facilitate the comparison of populations with differing age compositions, either different populations at one time or the same population at different times. The 2001 Australian population (ABS 2003) has been used as the standard population for all intra-Australia comparisons in this and the most recent two editions of *Australia's health* (2006 and 2004). The 1991 Australian population was used for these comparisons in earlier editions of *Australia's health* back to the 1996 edition; some statistics may thus differ slightly from those in some previous editions.

The European and the World Standard Populations have been used for some international comparisons. Details of these standard populations are provided.

Table A4: Age composition of the Australian population at 30 June 2001, and of European and World Standard Populations

Age group (years)	Australia, 30 June 2001	European Standard	World Standard
0	253,031	1,600	2,400
1–4	1,029,326	6,400	9,600
5–9	1,351,664	7,000	10,000
10–14	1,353,177	7,000	9,000
15–19	1,352,745	7,000	9,000
20–24	1,302,412	7,000	8,000
25–29	1,407,081	7,000	8,000
30–34	1,466,615	7,000	6,000
35–39	1,492,204	7,000	6,000
40–44	1,479,257	7,000	6,000
45–49	1,358,594	7,000	6,000
50–54	1,300,777	7,000	5,000
55–59	1,008,799	6,000	4,000
60–64	822,024	5,000	4,000
65–69	682,513	4,000	3,000
70–74	638,380	3,000	2,000
75–79	519,356	2,000	1,000
80–84	330,050	1,000	500
85 and over	265,235	1,000	500
Total	**19,413,240**	**100,000**	**100,000**

Sources: ABS 2003; WHO 1996.

Within Australia, most regional comparisons are among states and territories. For within-state comparisons, Australian Bureau of Statistics sources use capital city statistical areas and the rest of each state. Definitions for regional comparisons from other sources are not consistent, and are stated at appropriate places in the text.

Average annual rates of change or growth rates have been calculated as geometric rates:

$$\text{Average rate of change} = ((Pn/Po)^{1/N} - 1) \times 100$$

where Pn = value in later time period

Po = value in earlier time period

N = number of years between the two time periods.

The classification of deaths follows the 10th revision of the International Classification of Diseases (WHO 1992). Diseases treated in hospitals and the procedures performed during a hospital stay are classified using the fourth edition of the International statistical classification of diseases and related health problems, 10th revision, Australian Modification (ICD-10-AM) (NCCH 2004).

Presenting dates and time spans

Periods based on full calendar years (1 January to 31 December) are written as, for example, 2001 for one year. When there are two or more calendar years in the period, the first and final years are written in full. For example, 2001–2002 is a two calendar-year span and 2001–2003 covers three calendar years.

Periods based on financial years (1 July to 30 June, as with hospital statistics) are written with a second number which is abbreviated: for example, 2001–02 for one financial year, 2001–03 for two and 2001–04 for three. A longer span of financial years is written as 'In the 10-year period from 1997–08 to 2006–07…'.

Some surveys may be based on other 12-month spans—for example, the general practice BEACH survey is based on collection periods from 1 April to 30 March. These are presented as for financial years; for example, 2001–02 would be a 'year' or 12-month period.

Symbols

$	Australian dollars, unless otherwise specified
—	nil or rounded to zero
%	per cent
g	gram
kg	kilogram
'000	thousands
m	million
mm Hg	millimetres of mercury
mmol/L	millimoles per litre
n.a.	not available
. .	not applicable
nec	not elsewhere classified
n.p.	not published by the data source
>	more than
<	less than
≥	more than or equal to
≤	less than or equal to
*	value subject to sampling variability too high for most practical purposes and/or the relative standard error is 25% to 50%
**	value subject to sampling variability too high for most practical purposes and/or the relative standard error is more than 50%

References

ABS (Australian Bureau of Statistics) 2003. Australian demographic statistics, September quarter 2002. ABS cat. no. 3101.0. Canberra: ABS.

NCCH (National Centre for Classification in Health) 2004. The international statistical classification of diseases and related health problems, 10th revision, Australian modification (ICD-10-AM). 4th edition. Sydney: University of Sydney.

WHO (World Health Organization) 1992. International statistical classification of diseases and related health problems, 10th revision, volumes 1 and 2. Geneva: WHO.

WHO 1996. World health statistics annual, 1995. Geneva: WHO.

Abbreviations

AACR	Australasian Association of Cancer Registries
ABS	Australian Bureau of Statistics
ACIR	Australian Childhood Immunisation Register
ACSQHC	Australian Council for Safety and Quality in Health Care
ADHD	attention-deficit hyperactivity disorder
AGPS	Australian Government Publishing Service
AHCA	Australian Health Care Agreements
AHIC	Australian Health Information Council
AHMAC	Australian Health Ministers' Advisory Council
AHMC	Australian Health Ministers' Conference
AHMS	Australian Health Measurement Survey
AIDS	acquired immune deficiency syndrome
AIHW	Australian Institute of Health and Welfare
ALOS	average length of stay
AMD	age-related macular degeneration
AMI	acute myocardial infarction
ANZDATA	Australian and New Zealand Dialysis and Transplant Registry
AR-DRG	Australian Refined Diagnosis Related Group
ARI	acute respiratory infection
ART	assisted reproductive technology
ASGC	Australian Standard Geographic Classification
ASHR	Australian Study of Health and Relationships
AusDiab	Australian Diabetes, Obesity and Lifestyle Study
BEACH	Bettering the Evaluation and Care of Health
BMI	body mass index
BSE	bovine spongiform encephalopathy
CABG	coronary artery bypass grafting
CATI	computer-aided/assisted telephone interview
CHD	coronary heart disease
CHINS	Community Housing and Infrastructure Needs Survey
CJD	Creutzfeldt-Jakob disease
COPD	chronic obstructive pulmonary disease
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DALY	disability-adjusted life year
DDD	defined daily dose
DFLE	disability-free life expectancy
DHAC	Commonwealth Department of Health and Aged Care
DHS	Department of Human Services (Victoria)
DMFT	decayed, missing or filled teeth

DoHA	Australian Government Department of Health and Ageing
DRG	diagnosis related group
DVA	Australian Government Department of Veterans' Affairs
ESKD	end-stage kidney disease
FCTC	World Health Organization's Framework Convention on Tobacco Control
FOBT	faecal occult blood test
GDP	gross domestic product
GIFT	gamete intra-fallopian transfer
GP	general practitioner
GRIM	General Record of Incidence of Mortality
HBV	hepatitis B virus
HCV	hepatitis C virus
HDL	high-density lipoprotein
HDSC	Health Data Standards Committee
Hib	Haemophilus influenzae type b
HIC	Health Insurance Commission
HIV	human immunodeficiency virus
HSVD	heart, stroke or vascular diseases
ICD	International Classification of Diseases
ICD-10-AM	International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification
ICF	International Classification of Functioning, Disability and Health
ICPC	International Classification of Primary Care
ICSI	intra-cytoplasmic sperm injection
IFG	impaired fasting glucose
IGT	impaired glucose tolerance
IPD	invasive pneumococcal disease
IRSD	Index of Relative Socioeconomic Disadvantage
IVF	in-vitro fertilisation
LDL	low-density lipoprotein
LE	life expectancy
MBS	Medicare Benefits Schedule
MIR	mortality to incidence ratio
MMR	maternal mortality rate
MMR	measles, mumps and rubella
MND	motor neurone disease
MS	multiple sclerosis
MSIC	medically supervised injecting centre
NAGATSIHID	National Advisory Group on Aboriginal and Torres Strait Islander Health Information and Data
NATSIHS	National Aboriginal and Torres Strait Islander Health Survey
NATSINWP	National Aboriginal and Torres Strait Islander Nutrition Working Party

NATSISS	National Aboriginal and Torres Strait Islander Social Survey
NCCH	National Centre for Classification in Health
NCHECR	National Centre in HIV Epidemiology and Clinical Research
NCIRS	National Centre for Immunisation Research and Surveillance
NCSCH	National Cancer Statistics Clearing House
NDR	National Diabetes Register
NDSHS	National Drug Strategy Household Survey
NDSS	National Diabetes Services Scheme
NEHTA	National E-Health Transition Authority
NHDC	National Health Data Committee
NHFA	National Heart Foundation of Australia
NHIG	National Health Information Group
NHIMG	National Health Information Management Group
NHMRC	National Health and Medical Research Council
NHPA	National Health Priority Area
NHPC	National Health Performance Committee
NHS	National Health Survey
NNDSS	National Notifiable Diseases Surveillance System
NPIWG	National Public Health Information Working Group
NSAID	non-steroidal anti-inflammatory drug
NSMHW	National Survey of Mental Health and Wellbeing
OATSIH	Office for Aboriginal and Torres Strait Islander Health
OECD	Organisation for Economic Co-operation and Development
Pap	Papanicolaou (cervical smear test)
PBS	Pharmaceutical Benefits Scheme
PCI	percutaneous coronary intervention
PEI	patient episode initiation
PHIAC	Private Health Insurance Administration Committee
PHIIS	Private Health Insurance Incentives Scheme
PSA	prostate-specific antigen
RFE	reason for encounter
RPBS	Repatriation Pharmaceutical Benefits Scheme
RSE	relative standard error
RSV	respiratory syncytial virus
SAI	Standards Australia International
SARS	severe acute respiratory syndrome
SCRCSSP	Steering Committee for the Review of Commonwealth/State Service Provision
SCRGSP	Steering Committee for the Review of Government Service Provision
SEIFA	Socio-Economic Indexes for Areas
SH&FPA	Sexual Health and Family Planning Australia
SIDS	sudden infant death syndrome

SIGNAL	Strategic Inter-Governmental Nutrition Alliance
SIMC	Statistical Information Management Committee
SLA	statistical local area
SLTEC	shiga-like toxin-producing Escherichia coli
SMR	standardised mortality ratio
SPP	Specific Purpose Payment
SPR	standardised prevalence ratio
STI	sexually transmitted infection (sometimes referred to as sexually transmissible infection)
TAFE	technical and further education
TB	tuberculosis
TG	triglyceride
TSE	transmissible spongiform encephalopathy
URTI	upper respiratory tract infection
vCJD	variant Creutzfeldt-Jakob disease
VTEC	verotoxigenic Escherichia coli
VVCS	Vietnam Veterans Counselling Service
WHO	World Health Organization
WHO-ISH	World Health Organization–International Society of Hypertension
YLD	years lost due to disability
YLL	years of life lost (due to premature mortality)

Places

ACT	Australian Capital Territory
Aust	Australia
Can	Canada
Fra	France
Ger	Germany
Jpn	Japan
NSW	New South Wales
NT	Northern Territory
NZ	New Zealand
Qld	Queensland
SA	South Australia
Tas	Tasmania
UK	United Kingdom
USA	United States of America
USSR	former Union of Soviet Socialist Republics
Vic	Victoria
WA	Western Australia

Glossary

Aboriginal A person of Aboriginal descent who identifies as an Aboriginal and is accepted as such by the community in which he or she lives.

acute Coming on sharply and often brief, intense and severe.

acute coronary syndrome Describes acute *myocardial infarction (heart attack)* or *unstable angina* when they first present as a clinical emergency with chest pain or other features.

acute hospitals Public and private hospitals which provide services mainly to admitted patients with acute or temporary ailments. The average length of stay is relatively short.

addiction/addictive behaviour When a person shows a very high dependence on something that is harmful or dangerous to them. It is marked by repeated and compulsive activity which the person finds (or would find) very difficult or impossible to stop. The term is most often applied to addictive drug use, such as with alcohol, tobacco or other drugs.

admission Admission to hospital. In this report, the number of *separations* has been taken as the number of admissions, hence an admission rate is the same as a separation rate.

admitted patient A patient who undergoes a hospital's formal admission process.

affective disorders Mood disorders such as *depression*, *mania* and *bipolar affective disorder*. (The term does not include *anxiety disorders*, which are classified as a separate group.)

age-specific rate A rate for a specific age group. The numerator and denominator relate to the same age group.

age-standardisation A method of removing the influence of age when comparing populations with different age structures. This is usually necessary because the rates of many diseases vary strongly (usually increasing) with age. The age structures of the different populations are converted to the same 'standard' structure, then the disease rates that would have occurred with that structure are calculated and compared.

aids and appliances Durable medical goods dispensed to ambulatory patients that are used more than once for therapeutic purposes, such as glasses, hearing aids, wheelchairs and orthopaedic appliances and prosthetics that are not implanted surgically but are external to the user of the appliance. Excludes prostheses fitted as part of admitted patient care in a hospital.

Alzheimer's disease Condition marked by progressive loss of brain power shown by worsening short-term memory, confusion and disorientation. A form of *dementia*.

ambulatory care Care provided to hospital patients who are not admitted to the hospital, such as patients of emergency departments and outpatient clinics. The term is also used to refer to care provided to patients of community-based (non-hospital) health-care services.

anaemia A reduced level of haemoglobin, the protein that carries oxygen in the red blood cells. It has many causes, including bleeding (loss of red blood cells), low production of red blood cells, and processes that damage them. It can cause paleness, tiredness and even breathlessness.

angina Temporary chest pain or discomfort when the heart's own blood supply is inadequate to meet extra needs, as in exercise. See also *unstable angina* and *cardiovascular disease*.

angioplasty A method of reducing a blockage in an artery by opening out a balloon placed inside the artery at the point of narrowing. If the artery is a coronary artery the procedure is technically known as percutaneous transluminal coronary angioplasty (PTCA).

anxiety disorders A group of mental disorders marked by excessive feelings of apprehension, worry, nervousness and stress. Includes panic disorder, various phobias, generalised anxiety disorder, obsessive-compulsive disorder and post-traumatic stress disorder.

AR-DRGs See *diagnosis related groups*.

arrhythmia A disturbed rhythm of the heart beat—either too fast, too slow or irregular.

arthritis A group of disorders in which there is inflammation of the joints, which can become stiff, painful, swollen or deformed. The two main types of arthritis are *osteoarthritis* and *rheumatoid arthritis.*

associated cause(s) of death Any condition(s), diseases and injuries—other than the *underlying cause*—considered to contribute to a death. See also *cause of death.*

asthma A common, chronic inflammatory disease of the air passages causing widespread narrowing in them with obstruction of airflow and episodes of wheezing, chest tightness and shortness of breath. Different medications can prevent the episodes or relieve them.

atherosclerosis A process in which fatty and fibre-like deposits build up on the inner walls of arteries, often forming *plaques* that can then cause blockages. It is the main underlying condition in *heart attack, angina, stroke* and *peripheral vascular disease.*

atrial fibrillation A condition marked by an irregular, rapid heart beat. It arises because the heart's collecting chambers (atria) stop beating rhythmically and quiver uselessly (fibrillate).

auto-immune diseases Diseases such as *rheumatoid arthritis* and *Type 1 diabetes*, in which the immune system reacts against body tissues and damages them.

available beds Beds immediately available for use by admitted patients.

average length of stay (ALOS) The average of the length of stay for admitted patient episodes.

benchmark A standard or point of reference for measuring quality or performance. See also *benchmarking*.

benchmarking A continuous process of measuring quality or performance against the highest standards. See also *benchmark*.

bipolar affective disorder A mental disorder where the person may be depressed at one time and *manic* at another. Formerly known as *manic depression*.

blood cholesterol Fatty substance produced by the liver and carried by the blood to supply the rest of the body. Its natural function is to supply material for cell walls and for steroid hormones, but if levels in the blood become too high this can lead to *atherosclerosis* and heart disease.

body mass index (BMI) The most commonly used method of assessing whether a person is normal weight, underweight, overweight or obese. It is calculated by dividing the person's weight (in kilograms) by their height (in metres) squared; that is, kg ÷ m^2. For both men and women, underweight is a BMI below 18.5, acceptable weight is from 18.5 to less than 25, overweight is 25 and above (includes obese), and obese is 30 and over.

bronchitis Inflammation of the main air passages (the bronchi). May be acute (because of infection) or chronic (most often because of tobacco smoking).

bulk-billing The process by which a medical practitioner or optometrist sends the bill for services direct to Medicare, so the patients concerned pay nothing. Also known as direct billing.

campylobacteriosis A disease usually marked by diarrhoea, abdominal pain, fever, nausea and vomiting for a few days, caused by some types of *Campylobacter* bacteria and often foodborne.

cancer A large range of diseases, in which some of the body's cells become defective, begin to multiply out of control, can invade and damage the area around them, and can also spread to other parts of the body to cause further damage.

capital consumption The amount of fixed capital used up each year—otherwise known as depreciation.

capital expenditure Expenditure on large-scale fixed assets (for example, new buildings and equipment with a useful life extending over a number of years).

cardiovascular disease Any disease of the *circulatory system*, namely the heart (cardio) or blood vessels (vascular). Includes *heart attack, angina, stroke* and *peripheral vascular disease*. Also known as circulatory disease.

casemix The range and types of patients (the mix of cases) treated by a hospital or other health service. This provides a way of describing and comparing hospitals and other services for planning and managing health care. Casemix classifications put patients into manageable numbers of groups with similar conditions that use similar health-care resources, so that the activity and cost-efficiency of different hospitals can be compared. See *diagnosis related groups*.

cataract A cloudy or opaque area in the lens of the eye.

cause of death From information reported on the medical certificate of cause of death, each death is classified by the underlying cause of death according to rules and conventions of the 10th revision of the *International Classification of Diseases*. The underlying cause is defined as the disease that initiated the train of events leading directly to death. Deaths from injury or poisoning are classified according to the circumstances of the violence which produced the fatal injury, rather than to the nature of the injury. See also *underlying cause of death*.

cerebrovascular disease Any disorder of the blood vessels supplying the brain or its covering membranes. A notable and major form of cerebrovascular disease is stroke.

chemotherapy The use of drugs (chemicals) to prevent or treat disease, with the term usually being applied to treatment for cancer rather than for other uses.

cholesterol See *blood cholesterol*.

chronic Persistent and long-lasting.

chronic bronchitis Long-term condition with inflammation of the bronchi, the lung's main air passages, causing frequent coughing attacks and coughing up of mucus.

chronic diseases Term applied to a diverse group of diseases, such as heart disease, cancer and arthritis, that tend to be long-lasting and persistent in their symptoms or development. Although these features also apply to some *communicable diseases* (infections), the term is usually confined to non-communicable diseases.

chronic obstructive pulmonary disease (**COPD**) Serious, progressive and disabling long-term lung disease where damage to the lungs, usually because of both *emphysema* and *chronic bronchitis*, obstructs oxygen intake and causes increasing shortness of breath. By far the greatest cause is cigarette smoking.

circulatory disease See *cardiovascular disease* (alternative name).

circulatory system The heart along with the blood vessels, comprising the system that circulates blood around the body to supply oxygen and nutrients to all body tissues and to carry away waste products from them. Also known as the cardiovascular system.

cirrhosis Permanently damaged structure of the liver due to extensive death of its cells with resultant scarring. The main causes are chronic alcohol abuse and hepatitis C.

cohort A group of individuals being studied who have experienced the same event at a specified period in time; for example, 'birth cohort' refers to people born in the same year.

colonoscope See *colonoscopy*.

colonoscopy A procedure whereby the inside of the large bowel (colon) is viewed using a long flexible tube (*colonscope*) inserted through the anus.

colorectal cancer Cancer of the colon (the lower part of the intestine, usually 1.5 to 2 metres) or of the rectum (the final 15 cm of the colon, ending with the anus).

communicable diseases (infectious diseases) Diseases or illnesses due to infectious organisms or their toxic products. Communication may occur directly or indirectly via contact with other humans, animals or other environments that harbour the organism.

comorbidity When a person has two or more health problems at the same time.

complication A secondary problem that arises from a disease, injury or treatment (such as surgery) that worsens the patient's condition and makes treatment more complicated.

condition (health condition) A broad term that can be applied to any health problem, including symptoms, diseases, and various risk factors such as high blood cholesterol, obesity and so forth. Often used synonymously with *disorder* or *problem*.

confidence interval A statistical term describing a range (interval) of values within which we can be 'confident' that the true value lies, usually because it has a 95% or higher chance of doing so.

congenital A condition that is recognised at birth, or that is believed to have been present since birth, including conditions which are inherited or caused by environmental factors.

constant prices Dollar amounts for different years that are adjusted to reflect the prices in a chosen reference year. This provides a way of comparing expenditure over time on an equal dollar-for dollar basis without the distorting effects of inflation. The comparison will reflect only the changes in the amount of goods and services purchased, not the changes in prices of these goods and services caused by inflation.

coronary artery bypass graft (CABG) Surgical procedure using blood vessel grafts to bypass blockages in the coronary arteries and restore adequate blood flow to the heart muscle.

coronary artery disease Disease of the coronary arteries, typically meaning *atherosclerosis*. When this leads to symptoms such as chest pain the result is known as *coronary heart disease*.

coronary heart disease Disease due to blockages in the heart's own (coronary) arteries, expressed as *angina* or a *heart attack*. Also known as *ischaemic heart disease*.

crude death rate The number of deaths in a given period divided by the size of the corresponding population indexed to 100,000.

cryptosporidiosis A disease usually marked by diarrhoea with cramping abdominal pain and other symptoms, caused by *Cryptosporidium parvum* (a protozoan parasite) and transmitted directly from person to person, or foodborne.

dementia A general and worsening loss of brain power such as memory, understanding and reasoning.

dentate Having one or more natural teeth.

depression A mood disorder with prolonged feelings of being sad, hopeless, low and inadequate, with a loss of interest or pleasure in activities and often with suicidal thoughts or self-blame.

determinant Any factor that can increase the chances of ill health (risk factors) or good health (protective factors) in a population or individual. By convention, services or other programs which aim to improve health are often not included in this definition.

diabetes (diabetes mellitus) A chronic condition in which the body cannot properly use its main energy source, the sugar glucose. This is due to a relative or absolute deficiency in insulin, a hormone produced by the pancreas. Insulin helps glucose enter the body's cells from the bloodstream and then be processed by them. Diabetes is marked by an abnormal build-up of glucose in the blood and it can have serious short- and long-term effects. For the three main types of diabetes see *Type 1 diabetes*, *Type 2 diabetes* and *gestational diabetes*.

diagnosis related groups (DRGs) A widely used type of casemix classification system. In the case of Australian acute hospitals, AR-DRGs (Australian Refined Diagnosis Related Groups) classify admissions into groups with similar clinical conditions (related diagnoses) and similar resource usage. This allows the activity and performance of hospitals to be compared on a common basis. See also *casemix*.

dialysis/haemodialysis A process used to treat kidney failure. A machine is connected to the patient's bloodstream so it can take on the role of the kidneys by removing excess substances and waste from the blood.

diphtheria A bacterial infection that usually starts with soreness of the throat and tonsils but which can also affect other parts of the body and become severe enough to block breathing. It is preventable by vaccination.

direct billing See *bulk-billing*.

disability Described by the International Classification of Functioning, Disability and Health as a concept of several dimensions relating to an impairment in body structure or function, a limitation in activities (such as mobility and communication), a restriction in participation (involvement in life situations such as work, social interaction and education), and the affected person's physical and social environment. Described by the *Oxford concise colour medical dictionary* (1998) as 'a loss or restriction of functional ability or activity as a result of impairment of the body or mind'.

disability-adjusted life year (DALY) Years of healthy life lost through premature death or living with disability due to illness or injury.

disease A physical or mental disturbance involving *symptoms* (such as pain or feeling unwell), dysfunction or tissue damage, especially if these *symptoms* and *signs* form a recognisable clinical pattern.

disorder (health disorder) Used synonymously with *condition*.

donovanosis Infectious disease (previously called granuloma inguinale) caused by the bacteria *Chlamydia granulomatis*. It features painless genital ulcers with tissue destruction, and can result in secondary infection and scarring.

Down syndrome Condition caused by a genetic defect known as trisomy 21—an extra chromosome 21, making three instead of two. Produces a characteristic facial appearance and shortness, often with heart defects and usually reduced intelligence.

emphysema A chronic lung disease where over-expansion or destruction of the lung tissue blocks oxygen intake, leading to shortness of breath and other problems.

endoscopy The viewing of internal parts of the body, such as the inside of the lower bowel (the colon) with a *colonoscope*.

enterohaemorrhagic *E. coli* infection A disease marked by diarrhoea that can be mild or severe and bloody, and sometimes also by haemolytic uraemic syndrome (sudden kidney failure and anaemia in children) and other symptoms. It is caused by some types of *E. coli* bacteria and is usually foodborne.

epidemic An outbreak of a disease or its occurrence at a level that is clearly higher than usual, especially if it affects a large proportion of the population.

epidemiology The study of the patterns and causes of health and disease in populations, and the application of this study to improve health.

epilepsy A disturbance of brain function marked by recurrent fits and loss of consciousness.

external cause Environmental event, circumstance and/or condition as the cause of injury, poisoning and/or other adverse effect. The term is used in disease classification.

fertility rate Number of live births per 1,000 women aged 15–49.

fetal death Birth of a fetus weighing at least 400 grams (or, where birthweight is unavailable, of at least 20 weeks gestation), which shows no signs of life. Commonly referred to as stillbirth.

fetal death rate Number of fetal deaths per 1,000 total births (fetal deaths plus live births).

free-standing day hospital facility A private hospital where only minor operations and other procedures not requiring overnight stay are performed, and which does not form part of any private hospital providing overnight care.

gastroscopy A procedure whereby the inside of the stomach is viewed using a flexible tube passed down into it via the mouth.

generalised anxiety disorder A mental disorder where a person is overly and unrealistically anxious and worried about many things over a long period. One of the group of *anxiety disorders*.

gestational diabetes *Diabetes* which is first diagnosed during pregnancy (gestation). It may disappear after pregnancy but signals a high risk of diabetes occurring later on.

gout Disease of excess uric acid in the blood causing attacks of joint pain (most often in the big toe) and other problems.

gross domestic product (GDP) A statistic commonly used to indicate national wealth. It is the total market value of goods and services produced within a given period after deducting the cost of goods and services used up in the process of production but before deducting allowances for the consumption of fixed capital.

haemodialysis See *dialysis*.

health Term relating to whether the body (which includes the mind) is in a good or bad state. With good health the state of the body and mind are such that a person feels and functions well and can continue to do so for as long as possible. See also *public health*.

health indicator See *indicator*.

health outcome A change in the health of an individual or population due wholly or partly to a preventive or clinical intervention.

health promotion Activities to improve health and prevent disease, often described as the process that helps individuals and communities to increase control over the *determinants* of health.

health status An individual's or population's overall level of health, taking into account various aspects such as *life expectancy*, amount of *disability*, levels of disease *risk factors* and so on.

heart attack Life-threatening emergency that occurs when a vessel supplying blood to the heart muscle is suddenly blocked completely by a blood clot. The medical term commonly used for a heart attack is *myocardial infarction*. See also *cardiovascular disease*.

heart failure When the heart functions less effectively in pumping blood around the body. It can result from a wide variety of diseases and conditions that can impair or overload the heart, such as heart attack, other conditions that damage the heart muscle directly (cardiomyopathies), high blood pressure, or a damaged heart valve.

hepatitis Inflammation of the liver, which can be due to certain viral infections, alcohol excess or a range of other causes.

Hib (*Haemophilus influenzae* type b) infection A bacterial infection of infants and children that can cause meningitis, pneumonia and other serious effects. It is preventable by vaccination.

highly specialised drugs Under Section 100 of the National Health Act, certain drugs (for example, cyclosporin) can be supplied to community patients only through hospitals because the hospitals can provide the facilities or staff necessary for the appropriate use of the drugs. These drugs are funded by the Australian Government separately from the Pharmaceutical Benefits Scheme.

Hodgkin disease (Hodgkin lymphoma) A cancer marked by progressive painless enlargement of lymph nodes throughout the body. A form of *lymphoma*.

hostel Establishment for people who cannot live independently but who do not need nursing care in a hospital or nursing home. Hostels provide board, lodging or accommodation and cater mostly for the aged, distressed or disabled. Residents are generally responsible for their own provisions but may be given domestic assistance such as help with meals, laundry and personal care.

hypertensive disease Disease occurring when high blood pressure (hypertension) is severe or prolonged enough to cause damage to the heart, brain or kidneys.

illness A state of feeling unwell, although the term is also often used synonymously with disease.

immunisation Inducing immunity against infection by the use of an antigen to stimulate the body to produce its own antibodies. See *vaccination*.

impaired glucose tolerance Condition in which blood glucose levels are higher than normal but less than required for a diagnosis of diabetes, and which signals an increased risk of developing *Type 2 diabetes*.

impairment Any loss or abnormality of psychological, physiological or anatomical structure or function.

incidence The number of new cases (of an illness or event, and so on) occurring during a given period. Compare with *prevalence*.

indicator A key statistical measure selected to help describe (indicate) a situation concisely, track progress and performance, and act as a guide to decision making. It may have an indirect meaning as well as a direct one; for example, Australia's overall death rate is a direct measure of mortality but is often used as a major indicator of population health.

Indigenous A person of Aboriginal and/or Torres Strait Islander descent who identifies as an Aboriginal and/or Torres Strait Islander and is accepted as such by the community with which he or she is associated.

inflammation Local response to injury or infection, marked by local redness, heat, swelling and pain. Can also occur when there is no clear external cause and the body reacts against itself, as in *auto-immune diseases*.

insulin Hormone that is produced by the pancreas and regulates the body's energy sources, most notably the sugar glucose.

International Classification of Diseases International Statistical Classification of Diseases and Related Health Problems. The World Health Organization's internationally accepted classification of death and disease. The 10th Revision (ICD-10) is currently in use. In this report, causes of death classified before 1979 under previous revisions have been reclassified to ICD-10 by the AIHW. ICD-10-AM is the Australian modification of ICD-10, used for diagnoses and procedures recorded for patients admitted to hospitals.

intervention (for health) Any action taken by society or an individual which 'steps in' (intervenes) to improve health, such as medical treatment and preventive campaigns.

ischaemia Reduced or blocked blood supply. See also *ischaemic heart disease*.

ischaemic heart disease *Heart attack* and *angina* (chest pain). Also known as *coronary heart disease*. See also *ischaemia*.

length of stay Duration of hospital stay, calculated by subtracting the date the patient is admitted from the day of separation. All leave days, including the day the patient went on leave, are excluded. A same-day patient is allocated a length of stay of one day.

life expectancy An indication of how long a person can expect to live. Technically it is the number of years of life remaining to a person at a particular age if death rates do not change.

listeriosis A disease which normally appears in otherwise healthy people as an acute, mild fever, sometimes with influenza-like symptoms, caused by the bacteria *Listeria monocytogenes* and usually foodborne. It can cause more severe symptoms in newborns, the elderly, people with poor immunity and pregnant women (in whom it can also cause abortion).

long-term condition A term used in the ABS National Health Surveys to describe a health condition that has lasted, or is expected to last, at least six months. See also *chronic diseases*.

low birthweight Weight of a baby at birth that is less than 2,500 grams.

lymphoma A cancer of the lymph nodes. Lymphomas are divided into two broad types, *Hodgkin disease* lymphomas and *non-Hodgkin lymphomas*.

Major Diagnostic Categories (MDCs) A high level of groupings of patients used in the AR-DRG classification. See also *diagnosis related groups*.

malignancy See *cancer*.

mammogram X-ray of the breast. It may be used to assess a breast lump or as a screening test in women with no evidence of cancer.

mania A mental disorder where the person is overexcited, overactive and excessively and unrealistically happy and expansive. It is the opposite of depression and can alternate with it in the same person in what is known as *bipolar affective disorder* (formerly known as *manic depression*).

manic See *mania* and *manic depression*.

manic depression, manic depressive disorder See *bipolar affective disorder, mania,* and *depression*.

measles A highly contagious infection, usually of children, that causes flu-like symptoms, fever, a typical rash and sometimes serious secondary problems such as brain damage. It is preventable by vaccination.

median The midpoint of a list of observations ranked from the smallest to the largest.

Medicare A national, government-funded scheme that subsidises the cost of personal medical services for all Australians and aims to help them afford medical care.

melanoma A cancer of the body's cells that contain pigment (melanin), mainly affecting the skin.

meningitis Inflammation of the brain's covering (the meninges), as can occur with some viral or bacterial infections.

mental illness Disturbances of mood or thought that can affect behaviour and distress the person or those around them, so the person often has trouble functioning normally. They include *anxiety disorders, depression* and *schizophrenia.*

metastasis The spread of a cancer from its original site to other parts of the body.

morbidity Refers to ill health in an individual and to levels of ill health in a population or group.

mortality Death.

motor neurone disease A serious disease of the nervous system with progressive wasting of muscles, weakness and paralysis.

multiple sclerosis One of the most common nervous system disorders, with varied symptoms such as loss of control of limbs, sudden vision problems and disturbed sensations.

mumps A contagious viral disease marked by acute and painful swelling of the saliva-producing glands, often similarly affecting the testicles and sometimes other parts.

musculoskeletal Relating to the muscles, joints and bones.

myocardial infarction Term still commonly used to mean a *heart attack*, but more correctly refers only to those heart attacks which have caused some death of heart muscle.

neonatal death Death of an infant within 28 days of birth.

neonatal mortality rate Number of neonatal deaths per 1,000 live births.

neoplasm An abnormal ('neo', new) growth of tissue. Can be 'benign' (not a cancer) or 'malignant' (a cancer). Same as a *tumour*.

neural tube defects Defects such as spina bifida and anencephalus that have arisen in the neural tube, the part of the embryo that develops into the brain and spinal cord.

neurosis/neurotic disorders A broad category of mental disorders with anxiety as their main feature and whose symptoms are mostly exaggerations of normal emotions or behaviour. They include *anxiety disorders, obsessive-compulsive disorder, stress* reactions and other problems.

non-admitted patient A patient who receives care from a recognised non-admitted patient service/clinic of a hospital, including emergency departments and outpatient clinics.

non-Hodgkin lymphoma (NHL) A range of cancers of the lymphatic system (lymph glands and the channels they are linked to) that are not of the Hodgkin variety.

non-Indigenous People who have declared they are not of Aboriginal or Torres Strait Islander descent. Used interchangeably with o*ther Australians*.

nursing homes Establishments which provide long-term care involving regular basic nursing care to chronically ill, frail, disabled or convalescent people, or senile inpatients. Also referred to as *residential aged care facilities*.

obesity Marked degree of overweight, defined as *body mass index* of 30 or over. See also *overweight*.

obsessive-compulsive disorder A form of *anxiety disorder* where repeated and unwanted thoughts and impulses disturb and dominate a person. Often involves rituals such as excessive hand washing, checking and counting, which in turn cause anxiety if they are prevented or out of control.

occasion of service Occurs when a patient receives some form of service from a functional unit of a hospital, but is not admitted.

ophthalmology A medical specialty dealing with eye diseases.

Organisation for Economic Co-operation and Development (OECD) An organisation of 30 developed countries, including Australia.

osteoarthritis A chronic and common form of *arthritis*, affecting mostly the spine, hips, knees and hands. It first appears from the age of about 30 and is more common and severe with increasing age.

osteoporosis Thinning and weakening of the bone substance, with a resulting risk of fracture.

other Australians People who are not of Aboriginal or Torres Strait Islander descent, or whose status is not known. Used interchangeably with *non-Indigenous*.

outcome (health outcome) A health-related change due to a preventive or clinical intervention or service. (The intervention may be single or multiple, and the outcome may relate to a person, group or population, or be partly or wholly due to the intervention.)

out-of-pocket costs The total costs incurred by individuals for health-care services over and above any refunds from Medicare and private health insurance funds.

overweight Defined as a body mass index of 25 or over. See also *obesity*.

P value The probability that an observed difference has arisen by chance alone. By convention, a P value of 0.05 or less is usually considered *statistically significant* because the difference it relates to would occur by chance alone only one in twenty times or less often.

panic disorder Marked by panic attacks (episodes of intense fear or discomfort) that occur suddenly and often unpredictably.

Pap smear Papanicolaou smear, a procedure to detect cancer and pre-cancerous conditions of the female genital tract.

parasuicide The deliberate or ambivalent act of self-damage which is potentially life-threatening, but does not result in death.

pathology General term for the study of disease, but often used more specifically for diagnostic services which examine specimens, such as samples of blood or tissue.

patient days The number of full or partial days of stay for patients who were admitted for an episode of care and who underwent separation during the reporting period. A patient who is admitted and separated on the same day is allocated one patient day.

patient transport services Organisations engaged mainly in providing transport of patients by ground or air, along with health (or medical) care. These services are often provided during a medical emergency but are not restricted to emergencies. The vehicles are equipped with lifesaving equipment operated by medically trained personnel. Includes public ambulance services or flying doctor services, such as the Royal Flying Doctor Service and Care Flight. Also includes patient transport programs such as patient transport vouchers or support programs to assist isolated patients with travel to obtain specialised health care. (Note: Previously called 'Ambulance and other'.)

performance indicators Measures of the efficiency and effectiveness of health services (hospitals, health centres, and so forth) in providing health care.

perinatal Pertaining to or occurring in the period shortly before or after birth (usually up to 28 days after).

perinatal death Fetal or neonatal death.

perinatal mortality rate Number of perinatal deaths per 1,000 total births (fetal deaths plus live births).

peripheral vascular disease Pain in the legs due to an inadequate blood supply to them.

pertussis (whooping cough) A highly infectious bacterial disease of the air passages marked by explosive fits of coughing and often a whooping sound on breathing in. It is preventable by vaccination.

Pharmaceutical Benefits Scheme (PBS) A national, government-funded scheme that subsidises the cost of a wide range of pharmaceutical drugs, and that covers all Australians to help them afford standard medications.

phobia A form of *anxiety disorder* in which there is persistent, unrealistic fear of an object or situation and which interferes with the person's life as they seek to avoid the object of their fear. Phobias include fear of heights, flying, open spaces, social gatherings, and animals such as spiders and snakes.

plaque (atherosclerotic) A localised area of *atherosclerosis*, especially when raised or built up, and which may cause blockages in arteries.

poliomyelitis (polio) Muscle paralysis, wasting and deformity of limbs after infection by a common virus (poliovirus) that can damage the so-called motor nerves in the spinal cord. It is preventable by vaccination.

post-traumatic stress disorder (PSD) A form of *anxiety disorder* in which a person has a delayed and prolonged reaction after being in an extremely threatening or catastrophic situation such as a war, natural disaster, terrorist attack, serious accident or witnessing violent deaths.

potential years of life lost (PYLL) Number of potential years of life lost in a population as a result of premature death.

prescription drugs Pharmaceutical drugs available only on the prescription of a registered medical practitioner and available only from pharmacies.

prevalence The number or proportion (of cases, instances, and so forth) present in a population at a given time. Compare with *incidence*.

prevention (of disease or ill health) Action to reduce or eliminate the onset, causes, complications or recurrence of disease or ill health.

principal diagnosis The diagnosis describing the problem that was chiefly responsible for the patient's episode of care in hospital.

private hospital A privately owned and operated institution, catering for patients who are treated by a doctor of their own choice. Patients are charged fees for accommodation and other services provided by the hospital and relevant medical and allied health practitioners. The term includes private *free-standing day hospital facilities*.

private patient Person admitted to a private hospital, or person admitted to a public hospital who decides to choose the doctor(s) who will treat them or to have private ward accommodation. This means they will be charged for medical services and accommodation.

problem (health problem) Another poorly defined term often used synonymously with *condition* or *disorder*. May also be used more specifically to refer to symptoms and other health factors that a person or the doctor perceives as a concern—a problem—that needs attention; and which, for example, the person may record in a survey or their doctor may list in clinical notes to form a 'problem list'.

prostate cancer Cancer of the prostate, the male organ that sits next to the urinary bladder and contributes to the semen (sperm fluid).

psychiatric hospitals Establishments devoted mainly to the treatment and care of admitted patients with mental illness.

psychosis A broad grouping for a more severe degree of mental disturbance, often involving fixed, false beliefs known as delusions.

public health Term variously referring to the level of health in the population, to actions that improve that level or to related study. Activities aimed at benefitting a population tend to emphasis prevention, protection and health promotion as distinct from treatment tailored to individuals with symptoms. Examples include provision of a clean water supply and good sewerage, conduct of anti-smoking education campaigns, and screening for diseases such as cancer of the breast and cervix.

public hospital A hospital controlled by a state or territory health authority. In Australia public hospitals offer free diagnostic services, treatment, care and accommodation to all Australians who need them.

public patient A patient admitted to a public hospital who has agreed to be treated by doctors of the hospital's choice and to accept shared ward accommodation. This means that the patient is not charged.

quintile A group derived by ranking the population according to specified criteria and dividing it into five equal parts.

radiology The use or study of X-rays and other rays to help view internal parts of the body as a guide to diagnosis as well as to treatment and its progress.

real expenditure Expenditure expressed in terms which have been adjusted for inflation (for example, in 1989–90 dollars). This enables comparisons to be made between expenditures in different years.

recurrent expenditure Expenditure on goods and services which are used up during the year—for example, salaries. It may be contrasted with *capital expenditure*.

refraction The eye's ability to bend the light rays that enter it, to form an image at the back of the eye.

renal dialysis See *dialysis/haemodialysis*.

residential aged care facilities See *nursing homes*.

revascularisation ('re-vesselling') Restoring adequate blood flow to the heart or other part of the body, usually after the supply has been reduced or blocked, as in angina or a *heart attack*. Revascularisation includes methods such as *angioplasty* and *coronary artery bypass graft* surgery.

rheumatic fever An acute, serious disease that affects mainly children and young adults and can damage the heart valves, the heart muscle and its lining, the joints and the brain. Is brought on by a reaction to a throat infection by a particular bacterium. Now very rare in the non-Indigenous population, it is still at unacceptably high levels among Indigenous Australians living in remote areas. See *rheumatic heart disease*.

rheumatic heart disease Chronic disease from damaged heart valves caused by earlier attack(s) of *rheumatic fever*.

rheumatoid arthritis A chronic, multisystem disease whose most prominent feature is joint inflammation, most often affecting the hand joints in symmetrical fashion. Can occur in all age groups but most commonly appears between ages 20 and 40 years. Its causes are not certain but involve *auto-immune* processes.

risk factor Any factor which represents a greater risk of a health disorder or other unwanted condition or event. Some risk factors are regarded as causes of disease, others are not necessarily so. Along with their opposites, protective factors, risk factors are known as *determinants*.

rubella (German measles) A communicable disease of children and young adults which has mild symptoms but which often causes serious birth defects if it occurs in a mother during the first 3 months of pregnancy. It is preventable by vaccination.

salmonellosis A disease commonly marked by sudden onset of headache, abdominal pain, fever, diarrhoea, nausea and sometimes vomiting, caused by some types of salmonella bacteria and often foodborne.

same-day patients Admitted patients who are admitted to hospital and separated on the same day.

schizophrenia A group of serious mental disorders where imagined and disordered thoughts are key features, often with problems of behaviour, mood and motivation, and a retreat from social life.

separation The formal process by which a hospital records the completion of treatment and/or care for an admitted patient.

shigellosis A communicable disease characterised by acute diarrhoea with fever, nausea and sometimes other symptoms, usually transmitted directly from person to person via the faecal–oral route. It is caused by *Shigella* species bacteria, including *Shigella dysenteriae 1,* the cause of dysentery.

sign (clinical) An indication of a disorder that is detected by a clinician or other observer who examines the person affected. Unlike with *symptoms*, a patient does not necessarily notice or complain of a sign and many signs are detected only with special techniques used by the person doing the examination.

statistical significance An indication from a statistical test that an observed difference or association may be significant or 'real' because it is unlikely to be due just to chance. A statistical result is usually said to be 'significant' if it would occur by chance only once in twenty times or less often. See *P value*.

statistics (health) Numerical description of a population's health and the factors affecting that health.

stent A metal mesh tube that is expanded within an artery at a point of narrowing and left there to hold the artery open.

stillbirth See *fetal death*.

stress Poorly defined term referring to when a person is under significant psychological or physical pressure—real or perceived, acute or chronic. Examples include illness or injury, bereavement, family problems, work demands or job loss.

stroke When an artery supplying blood to the brain suddenly becomes blocked or bleeds. Often causes paralysis of parts of the body normally controlled by that area of the brain, or speech problems and other symptoms.

substance use disorder Disorder of harmful use and/or dependence on illicit or licit drugs, including alcohol, tobacco and prescription drugs.

suicide Deliberately ending one's own life.

symptom Any indication of a disorder that is apparent to the person affected. Compare with *sign (clinical)*.

tetanus A serious infection in which a bacterial nerve poison causes spasm of the jaw muscles (lockjaw) and body muscles generally. It is caused by a bacterium entering through a wound. The disease is preventable by vaccination.

thrombolysis Emergency 'clot-busting' drug treatment for a *heart attack*.

thrombosis Clotting of blood, with the term usually applied to clotting within a blood vessel due to disease, as in a *heart attack* or *stroke*.

tinnitus The sensation of ringing or other sounds in the ears when there is no external source of sound.

Torres Strait Islander A person of Torres Strait Islander descent who identifies as a Torres Strait Islander and is accepted as such by the community in which he or she lives.

transient ischaemic attack (TIA) A 'mini' *stroke*, with temporary problems in speech or paralysis that last for 24 hours or less, often only minutes. It is a strong warning sign of a more severe stroke.

tuberculosis (TB) A bacterial disease that affects the lungs especially, with serious fever-like symptoms and destruction of tissue. It can spread to other parts of the body, causing secondary problems and often death if not treated.

tumour See *neoplasm*.

Type 1 diabetes A form of *diabetes* mostly arising among children or younger adults, marked by a complete lack of insulin and needing insulin replacement for survival.

Type 2 diabetes The most common form of *diabetes*, occurring mostly in people aged 40 years or over, and marked by reduced or less effective insulin.

underlying cause of death The condition, disease or injury initiating the sequence of events leading directly to death; that is, the primary or main cause. Compare with *associated cause(s) of death*.

underweight Defined as a *body mass index* less than 18.5.

unstable angina A form of *angina* that is more dangerous than normal angina but less so than a *heart attack*. It can feature chest pain that occurs at rest; and in someone who already has angina it can be marked by new patterns of onset with exertion or by pain that comes on more easily, more often or for longer than previously.

uraemia A marker of kidney failure, with a build-up in the blood of urea and related waste products which the kidneys would normally eliminate through the urine.

vaccination The process of administering a vaccine to a person to produce immunity against infection. See *immunisation*.

vector An insect or other organism that transmits infectious micro-organisms from animal to human or human to human.

ventricular septal defect A congenital defect of the heart that occurs as an opening in the wall that separates the left and right main pumping chambers (the ventricles).

whooping cough See *pertussis*.

yersiniosis A disease typically involving acute diarrhoea, fever and other abdominal symptoms, caused by the bacteria *Yersinia pseudotuberculosis* and *Yersinia enterocolitica* and often foodborne.

Index

Index

B

C

D

E

F

G

H

I

M

N

O

P

Q

R

S

T

U

V

W

Y

Z