Australia's health 2006

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

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The Hon Tony Abbott 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 2006,* 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
Chairperson of the Board

3 May 2006

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Contents

Preface

Introducing *Australia's health 2006*, the tenth edition of our biennial health report to all Australians, is a great pleasure for me. I have watched as previous editions of *Australia's health* and its sister publication *Australia's welfare* have become increasingly comprehensive and well-regarded. *Australia's health 2006* is not the kind of publication to read cover to cover. But it is a rich reference source with a wealth of information about the health status of our fellow Australians and the health services they receive. In particular, it is an essential resource for policy makers and for those who want to understand the big picture of health in Australia better.

The report shows that Australians generally have good health and are privileged to have a range of health care services available to them. There are stark exceptions to this that can be confronting—even if well-known already—notably the generally much poorer health status of Indigenous Australians.

Health care service provider and funding arrangements are both increasingly complex and increasingly costly to both individuals and taxpayers. A continuing challenge is how to balance both the complementary and competitive perspectives of government and non-government agencies, professional groups, and small businesses. Overall, national expenditure on health was 9.7% of GDP in 2003–04; and average health expenditure per person has grown by an average 3.8% each year between 1997–98 to 2002–03. Expenditure on aids and appliances, health research and pharmaceuticals contributed more to this growth than other areas.

While the ageing of the population is having a significant impact on the number and type of health care services delivered, high quality services for children continue to be a priority. *Australia's health 2006* has a special chapter focusing on children and their health. The chapter highlights the fact that while our children are generally very healthy, there are concerns that their ongoing health could be affected by more and more of them becoming overweight or obese. Levels of diabetes are now rising among our children and it is a continuing concern that asthma and mental health problems affect so many of them.

Many colleagues in and out of the AIHW, including its collaborating centres, have worked with commitment to produce *Australia's health 2006*. I thank them wholeheartedly for creating this dependable reference work for all Australians. Much of the groundwork was done under the experienced guidance of the former Director, now Professor Richard Madden, and I thank him for his substantial legacy to the Institute.

Finally, I will steal a moment to recognise the outstanding contribution of Dr Ching Choi, who resigned from the AIHW this year after 14 years of service. As Head of the Institute's Welfare Division, Ching 'steered' to publication five editions of *Australia's welfare* (1993, 1995, 1997, 1999 and 2001). Then as Head of the Health Division he oversaw three editions of *Australia's health* (2002, 2004 and now 2006). I am told by his many admirers that he did this with unswerving attention to matters managerial, editorial and of substance. Thank you Ching and good luck.

Penny Allbon

Director

Australian Institute of Health and Welfare

Overview—*Australia's health 2006*

Australians generally enjoy very good health and Australia's international ranking for numerous aspects of health is high and better than a decade or so ago (see Figure 1.1). This overview section presents selected findings from the body of the report's seven chapters. Please use the index at the back to find pages with more detail on topics of interest.

General

Life expectancy and death

- Australians continue to live longer. Babies born today can expect to live for over 80 years on average. For females, life expectancy at birth in 2002–2004 was 83 years and for males it was 78 years.
- The life expectancy of Australians places us among the top five nations in the world.
- At age 65, Australian men in 2002–2004 could expect to reach the age of 82.5 years on average and women to reach 86.1 years—respectively about six and eight years more than their counterparts in the early 20th century.
- Almost 80% of Australia's deaths now occur in those aged 65 or over; and almost 1 in 3 (31%) occur in those aged 85 or over.

Health and ill health

- Across numerous important health indicators, Australia ranks among the top 10 of the world's developed countries.
- In 2004–05, 56% of Australian adults and young people in a national survey rated their health as excellent or very good, more than in surveys in 2001 and 1995.
- Death rates for cardiovascular disease continue to decline, including heart attack and stroke.
- Australia's overall cancer death rates declined by about 14% between 1986 and 2004 and these rates are low when compared with other Western countries.
- Despite improvements, cancer is now Australia's leading cause of death among 45–64 year olds and causes more premature deaths and overall disease burden than cardiovascular disease.
- Mental ill health is the leading cause of the non-fatal burden of disease and injury in Australia. Also, it is estimated to have caused about one eighth of the total Australian disease burden in 2003, exceeded only by cancer and cardiovascular disease.
- An estimated 1 in 5 Australians will have a mental illness at some time in their lives; and, from the National Health Survey of 2004–05, about 2.1 million people have a mental or behavioural problem as a long-term condition.
- Despite this, the overall suicide rate for males in 2004 was among the the lowest since national records began in 1907 (excluding the World War II period) and for females it was similarly one of the lowest recorded.

- The great fall in deaths from traffic accidents continued since the peak year of 1970. Compared with 1970, male rates in 2004 were down by three-quarters and female rates also showed a large fall.
- The prevalence of self-reported asthma fell considerably between 2001 and 2004–05.
- The prevalence of self-reported diabetes more than doubled between 1989–90 and 2004–05. However, between 1997 and 2004, death rates from diabetes were stable for males and fell slightly for females.

Health risks

- Smoking rates continue to fall, with 1 in 6 Australians aged 14 years or over smoking tobacco daily in 2004, compared with 7 in 10 men and 3 in 10 women in the 1950s.
- About 1 in 12 young people aged 12–19 years smoked daily in 2004, more females (9.1%) than males (7.3%).
- Between 1993 and 2004, the proportion of Australians aged 14 years or over using illicit drugs during the previous 12 months decreased with few exceptions; however, the proportion that used alcohol increased.
- In 2004, about 5 in 6 Australians aged 14 years or over had drunk alcohol in the previous 12 months. About 1 in 12 had drunk at levels that risked harm in both the short and long term.
- From self-reports in 2004, about 1 in 7 Australians aged 14 years or over had used an illicit drug during the previous 12 months, with 1 in 9 using cannabis.
- An estimated 2.5 million adults were obese in 2004–05, about 1 in 5 males aged 18 years or over and 1 in 6 females. A further 4.9 million were estimated to be overweight but not obese.
- In 2004, about half of Australia's adults did not undertake leisure-time physical activity at levels recommended for health benefits. Females reported less leisure-time physical activity than males.

Population groups

Infants (aged under 1 year)

- Australia's infant death rates almost halved over the two decades up to 2003. However, the 2003 rate of 4.8 deaths per 1,000 live births was still double that of the world's lowest rate, 2.4 in Iceland.

Children (aged under 15 years)

- Children under 15 years are generally much healthier than in previous generations, with a fall in their death rates of over 90% over the past 100 years and a halving over the past two decades.
- Vaccination rates of children have improved in recent years. The most recent data show that respective full vaccination rates for those aged 1, 2 and 6 years are 91%, 92% and 84%.
- Smoking rates among children aged 12–14 years almost halved between 1984 and 2002, from 17% to 9%.

- The proportion of children under 15 years who are overweight or obese continues to rise, according to state-level data.
- The incidence of diabetes among children under 15 years has increased in recent years.

Young people (aged 15–24 years)

- Over the past two decades, mortality for young people fell by over 30%.
- The large fall in the overall male suicide rate since 1997 was largely driven by a halving for 15–24 year olds from a peak in the early 1990s.
- In 2004–05, 19% of young Australians were overweight and a further 6% were obese, making 1 in 4 with excess weight.
- In 2004, almost 4 in 10 (39%) young Australians had drunk alcohol in the previous 12 months at levels that risked harm in the short term.
- In 2004, almost 3 in 10 young Australians had used an illicit drug in the previous 12 months.

Older people (aged 65 years or over)

- Dementia is the greatest single contributor to the burden of disease due to disability at older ages, as well as the greatest single contributor to the cost of care in residential aged care. It is estimated that in 2004 about 171,000 people aged 65 years or over had dementia.

Indigenous Australians

- About 70% of Indigenous Australians die before reaching 65 years of age, compared with little over 20% for other Australians.
- Death rates of Indigenous infants generally remain about 3 times those of other Australian infants.
- The death rates of Indigenous children (under 15 years) are around 2–3 times as high as for other Australian children.
- Despite this picture, death rates for Indigenous Australians fell significantly between 1991 and 2003 in Western Australia.
- Similarly there were major falls in Indigenous infant mortality rates between 1991 and 2003.

Socioeconomically disadvantaged people

- Infants living in the most disadvantaged areas (bottom fifth) of Australia had twice the death rate of those in the least disadvantaged (top fifth) in 2000–2002. During childhood, the same comparison showed a 75% and 46% higher rate for boys and girls respectively.
- In 1998–2000, the death rate for males living in areas of most socioeconomic disadvantage was 80% higher overall than for males living in areas of least disadvantage; and correspondingly for females the rate was 50% higher.

- Those aged 25–64 years who live in socioeconomically disadvantaged areas are more likely, compared with those in more advantaged areas, to assess their health as poor or only fair, drink alcohol at harmful levels (males,) smoke, be obese, and have high blood pressure.

Australians born overseas

- Death rates for Australians born in other countries are generally lower than for those born in Australia, probably in part because of a 'selection' factor. For example, in 2001–2003 the rate for Vietnam-born Australians was only 52% of that for persons born in Australia and for those born in China the corresponding figure was 70%.

People in rural and remote areas

- The health of Australians in rural and remote areas is generally worse than for those living in major cities. This reflects several issues, including the generally worse health of Indigenous Australians.

Prisoners

- A 2004 survey of prison entrants found that their prevalence of hepatitis C was 25 times as high as in the general population.

Health expenditure

- Health continues to grow in importance as a sector of the Australian economy—national expenditure on health was 9.7% of gross domestic product in 2003–04.
- Governments funded over two-thirds (68%) of the $78.6 billion total health expenditure in 2003–04.
- Hospital services accounted for over one-third (34.8%) of recurrent health expenditure in 2003–04.
- Government expenditure on public health (disease prevention and health promotion) accounted for 1.7% of recurrent health expenditure in 2003–04.
- Growth in recurrent health expenditure, in constant dollar terms, averaged 5.5% per year between 1997–98 and 2002–03. The most rapidly growing expenditures were on aids and appliances (up 13.9% per year on average), health research (12.5%) and pharmaceuticals (11.7%).
- Average per person expenditure on health for Aboriginal and Torres Strait Islander peoples was 18% higher than for other Australians although the general health status of Indigenous peoples was considerably poorer.

Health workforce

- In 2005, 1 in 17 of all employed people were in health occupations—nearly 570,000 Australians, representing a growth of 26% since 2000.
- Of these people in health occupations, about 4 in 5 were working in the health services industry; and of the 722,500 people working in the health services industry, a little over 3 in 5 were in health occupations.
- The 26% growth in numbers was much faster than the 11% growth across all occupations over the period, and translated to a rise from 2,359 to 2,802 health workers per 100,000 population, overall.

- This was not the pattern for every health occupation: for example there were decreases for general practitioners (down to 179 per 100,000 from 192) and pharmacists (down to 73 per 100,000 from 80).
- In 2003, about 7 in 8 registered medical practitioners were working in medicine and a similar proportion of registered and enrolled nurses were working in nursing.
- According to OECD figures, Australia had higher numbers of general practitioners and nurses relative to population in 2003 than did New Zealand, Canada, the United States and the United Kingdom.

Health services

- Health service use has increased by almost any measure: medical services up by 4.4% in just one year; hospital stays up almost 9% in the public sector over the last five years and 30% in the private sector; and pharmaceutical prescriptions up 41% over the latest decade.
- Around 85% of Australians visit a doctor at least once a year, at an average of five GP visits per Australian. However, this includes 4% of people having more than 50 medical services in a year.
- The most common reason patients have for visiting a doctor is for a general check-up or to get a prescription.
- From the doctor's perspective, the most common reasons for patient visits are high blood pressure, throat infection, depression, blood cholesterol problems and the need for vaccinations.
- There has been a marked increase in vaccinations against influenza for Australians aged 65 years or over, about 8 in 10 in 2004 compared with 6 in 10 in 1998.
- On any one day in Australia about 19,000 Australians are admitted to hospital and there are about 125,000 other hospital services, such as emergency department consultations. In a year there is about one hospital stay for every three Australians.
- Same-day admissions to hospitals now make up over half of all admissions.
- The private sector is gradually taking an increasing proportion of hospital patients, although public hospitals still provide about 60% of hospital stays and 70% of bed days.
- This 'shift' to private hospitals is largely driven by a general growth in same-day surgery, in turn reflected by a growth in the number of private free-standing day hospital facilities.
- Four of the top five reasons for hospital admission are usually managed as same-day stays: renal dialysis, chemotherapy, endoscopy and eye lens procedures.
- In 2003–04 almost 1 in 20 hospital separations were associated with an adverse event—harm from treatment or care—that arose either in the hospital itself or from outside.
- The average cost of a public hospital episode of care in 2003–04 was about $3,300.

1 Introduction

Health is not only important to individuals; the health of a nation's population also has important implications for national wellbeing and prosperity. Health and health care are consistently top interests for Australians, and more so as the population ages and as health and medical knowledge expands and then spreads within society.

While health and health care are topical and regularly covered by the electronic and print media, popular reports often portray a less than satisfactory picture. It is understandable that they tend to focus on sensational or 'new' things that can demand attention and concern. These include medical mishaps, service shortfalls and emerging epidemics, only partly balanced by the odd brilliant breakthrough. Examples of such concerns are any increases in the use of an illicit drug, long waiting lists for elective surgery, hospital adverse events, high levels of obesity and rising national health expenditure.

However, there are parallel and important good-news stories that deserve to be more widely known. They include the decline in use of most illicit drugs, the large rise in the number of surgeries undertaken, the vast number of successful hospital treatments with patients recovering well from their illnesses, the fall in mortality from major diseases such as heart disease and cancer, and the great value that people place on their health and how much they may be prepared to see paid for it (through the taxation system and out of their own pockets). There are also, of course, some disturbing facts which continue to pervade the picture. The poorer health of Australia's Indigenous population and the rise in obesity are two of these.

The role of *Australia's health*, therefore, is to put the various stories together in a rounded and balanced way and to present a much wider picture as a report card to the nation. This, the tenth biennial national report on the health of Australians, brings together key health statistics from many sources to give as comprehensive a picture as possible. It charts the progress of health in the past two decades or more, looking at the health status of the Australian population, the factors that influence that status, health services and expenditure.

This first chapter begins by summarising Australia's international standing in health and its comparative progress over recent decades. It then sets out the general Australian context before discussing what health is and broadly how it can be improved and the performance of the health system measured. The chapter next outlines the Australian health system; describes the role of national health information, how it is governed and some related information priorities; and concludes by summarising the structure of the rest of the report.

1.1 Australia compares well

Eighteen years ago in 1988, when the then Australian Institute of Health released the first *Australia's health* report, it concluded that:

> The general level of health of Australians is better than it has ever been. There have been remarkable declines in mortality from all causes and this trend has accelerated during the last 15 years. Yet Australia still lags behind other apparently comparable countries ... (AIH 1988:171).

Eighteen years on, the level of health of Australians has continued to improve. Moreover, in most aspects of health Australians no longer lag behind other comparable countries (those from the Organisation for Economic Co-operation and Development: OECD). There is now much better information in the community about health and the vast network of health services has continued to improve to provide prevention, early intervention and treatment of diseases.

Figure 1.1 shows broadly how Australia ranked in 1987 and 2002 on various aspects of health among 30 member countries of the OECD. Comparisons are made where data are available for a substantial number of countries (on average, 25 countries for each indicator) for the years 1987 and 2002, although in a few cases data relate to the years immediately preceding or following.

In 2002, Australia's life expectancy at birth had risen to be one of the highest in the world. Life expectancy at age 65 for males is second only to Japan, and for females is third behind Japan and France. Our ranking among OECD countries has improved markedly for mortality rates from coronary heart disease, stroke, lung cancer and transport accidents. Our smoking rates have continued to fall, with the ranking improving from middle third to 'best' third. The ranking for lower alcohol consumption has also improved a little. The dental health of our 12 year olds is at the top of the 'best' third, along with mortality from accidental falls. And various measures of life expectancy and mortality place Australia among the best in the world.

However, our ranking has fallen in relation to mortality from suicide, diabetes and respiratory diseases, and for infants, although our levels for these indicators remain among the middle third of the OECD countries. Our ranking for obesity has not changed and is clearly among the 'worst' third in the OECD group.

1.2 Australia at a glance

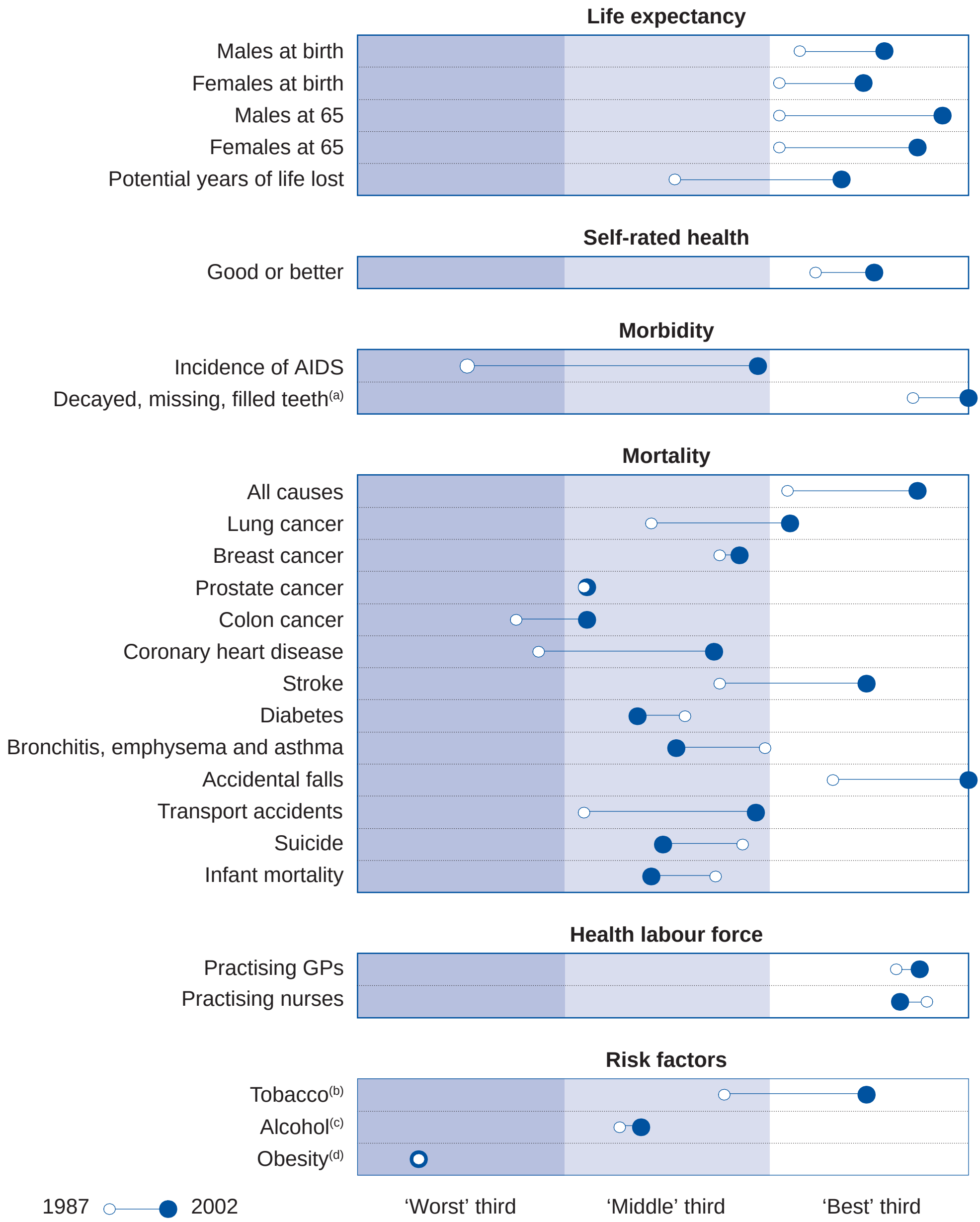
Australia is a vast continent with a relatively small population: 20.3 million people as at June 2005. The population is highly urbanised, with over 70% living in metropolitan areas and mostly near the coastline.

Australia is a nation made up mainly of migrants or their descendants; only 2.4% of the population reported Indigenous origin at the 2001 Population Census and over 50% of Australians were either born overseas or had at least one parent born overseas. The country of origin of Australia's population is diverse; migrants since World War II have come from all regions of the world (see Box 1.1).

1.3 Understanding health

What is health?

Defining the scope and boundary of health has always involved much debate. Those who propose a narrower definition often adopt a biomedical view, emphasising the presence or absence of diseases and medically measured risk factors. Those favouring a broader definition would include a wide range of social and economic determinants of health along with various aspects of wellbeing.



(a) Average number for 12 year olds.
(b) Daily smokers as a proportion of the population aged 15 years or over.
(c) Litres of pure alcohol per person aged 15 years or over.
(d) Proportion of the population with a body mass index greater than 30.
Source: OECD 2005.

Figure 1.1: Australia's ranking among OECD countries, selected indicators, 1987 and 2002

Box 1.1: Australia at a glance

- *20.3 million population at June 2005, including about 493,000 Indigenous people (2.4% of total)*
- *Climate varied but mainly dry, high exposure to sun radiation*
- *Gross domestic product (GDP) per person was $10,693 in September 2005. In 2003, Australia ranked 12th among OECD countries. Services industries are the main contributor to GDP (56% in 2004–05)*
- *Real national net disposable income per person in September 2005 was $8,973*
- *Unemployment at 5.2% in January 2006*
- *High ownership of residential housing—in 2002–03, 69% of households were outright owners or paying off a home loan*
- *14.9% of households spent 30% to 50% of their gross income on housing, and 4.7% spent more than 50%, in 2002–03*
- *Fertility rate of 1.77 births per woman in 2004, well below replacement level but relatively stable and middle-ranking among developed countries*
- *Infant mortality rate of 4.7 per 1,000 live births in 2004, middle range among developed countries; however, the rate for the Indigenous population is about 3 times this rate*
- *Average expectation of life at birth was 78.1 years for males and 83.0 for females, in 2002–04; however, estimates of Indigenous expectation of life at birth for 1966–2001 were 59.4 years for males and 64.8 years for females*
- *Life expectancy free of severe and profound disability was 72.4 years for males and 74.5 for females in 2003*
- *Number of days per year when the concentration of PM_{10} (particles with diameter of 10 microns or less) and ozone exceeded the air quality National Environmental Protection Measure standards: in 2003, Sydney PM_{10} 10 days and ozone 4 days; Melbourne PM_{10} 13 days and ozone 2 days; other cities much lower.*

The World Health Organization, in its 1946 Constitution, adopted a broad definition and defined health as a 'state of complete physical, mental and social wellbeing and not merely the absence of disease and infirmity' (WHO 1946). At that time, such a wide-ranging definition was revolutionary, in particular in the inclusion of social wellbeing into the concept of health. This definition has encouraged health researchers to broaden their scope and has given legitimacy and added emphasis to research on the determinants of health and health outcomes.

The development of health statistics has also been influenced by this broadening of the scope of health. While much of 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 on 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 the level of health functioning and outcomes.

A framework

Australia's health is based on the conceptual framework presented in Figure 1.2. It shows that Australia's levels of health and wellbeing, including diseases and disability, are influenced by a complex interplay between health determinants, interventions and resources, including systems. Health determinants can be socioeconomic, environmental, behavioural (such as alcohol use or physical activity), biomedical (such as blood cholesterol or blood pressure) and genetic factors.

These causes and their effects on health and wellbeing can be modified to various degrees by prevention and health promotion, treatment, rehabilitation and other health care. Such interventions are supported by human and material resources and associated systems, including essential information via research, monitoring and evaluation.

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

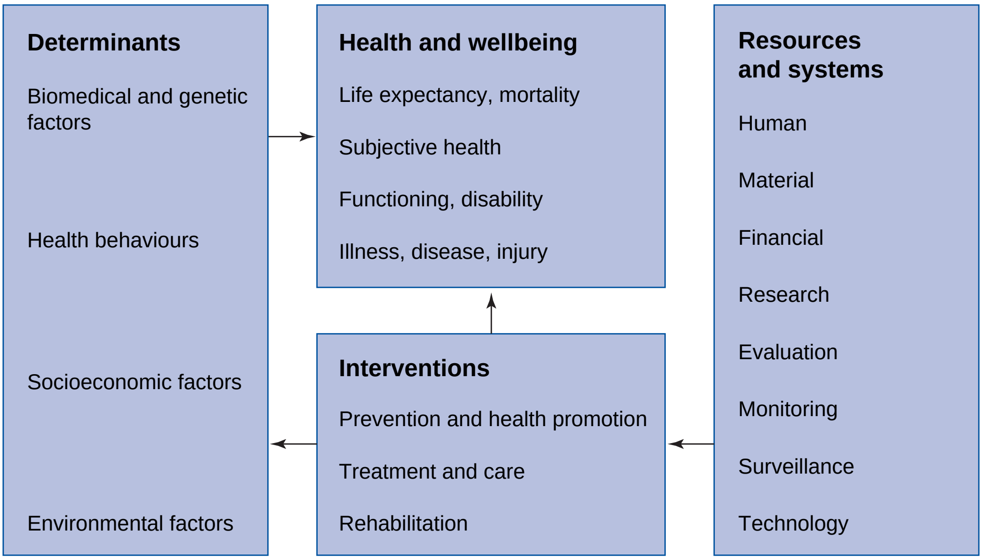


Figure 1.2: Conceptual framework for *Australia's health*

1.4 Improving health and measuring performance

Many things influence health—as further described in Chapter 3—including preventive and treatment interventions. Having a country that is socially and economically prosperous is arguably the most important factor in ensuring a good average level of health in the population. These general influences in turn affect other major factors that interact and lead to differences among individuals and subpopulations in their health—such as their education and income levels, their choices about healthy living, and so forth. A prosperous country can also afford to spend more on health care, thereby improving the health of its population. Conversely, improving health could lead to improved education and employment which, in turn, leads to economic and social prosperity.

Action on broad social determinants 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 and at many levels. 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. As well as seeking to reduce people's exposure to risks, some health strategies aim to help individuals develop personal skills to exercise more control over their own environments and to make healthy choices. Other strategies may aim to enhance a community's capacity to provide culturally relevant services.

The health system's effectiveness in achieving its goals is ultimately a function of its performance as a system. In 2001, Australia's National Health Performance Committee adopted a conceptual framework specially designed for measuring that performance (NHPC 2001). This framework (Figure 1.3) is consistent with the *Australia's health* conceptual framework, and offers a structure for considering system performance. Its components include the:

- 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
- degree to which care is integrated and coordinated.

Given the great range of influences on health, many major improvements depend on a strong partnership among components of the system—such as public 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, employers, and so on.

As in other areas of public policy, pursuing the best health for a society will often involve value judgments and include political processes because of 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.

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

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

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 system is complex, with many types of service providers and a variety of funding and regulatory mechanisms. Those who provide services include a range of medical practitioners, other health professionals, hospitals, clinics, and other government and non-government agencies. Funding is provided by the Australian Government, state and territory governments, health insurers, individual Australians and a range of other sources.

Overall coordination of major components of the health care system is the responsibility of the Australian Health Ministers' Advisory Council (AHMAC)—a committee of the heads of the Australian Government, state and territory health authorities, and the Australian Government Department of Veterans' Affairs. AHMAC advises the Australian Health Ministers' Conference on policy, resources and financial issues. Specific national bodies (currently being reviewed) have been established by AHMAC or the ministers to coordinate information, advice and program implementation, namely the:

- National Health Priorities Action Council, which oversees government activities to promote better services and achieve better results in priority health areas
- Australian Safety and Quality Commission in Health Care, which leads national efforts to improve the safety and quality of health care, with a particular focus on minimising the likelihood and effects of error

- National Public Health Partnership, which plans and coordinates national public health activities
- National Health Information Group (NHIG), which coordinates and directs the implementation of the National Health Information Agreement (see page 10).

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. These schemes subsidise payments for services provided by doctors and optometrists, and for a high proportion of prescription medications bought from pharmacies. The Australian and state and territory governments also jointly fund public hospital services. Between them, these 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 integrated with 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.

Many patients' 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, depending on the GP's billing arrangements. For specialised care, patients can be referred 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 in areas such as mental health, alcohol and other drugs, 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.

Patients admitted to a public hospital can choose to be treated as public or private patients. Public patients receive treatment from doctors and specialists nominated by the hospital, but are not charged for their care and treatment.

Patients treated in a private hospital—or as a private patient in a public 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 funds contribute towards medical fees and the hospital costs for insured patients. 'No-gap' or 'known-gap' arrangements are increasingly being agreed on between hospitals and insurers.

Australians also visit dentists and other private sector health professionals of their choice such as physiotherapists, chiropractors and natural therapists. Charges are usually met by the patients themselves or with the support of private health insurance. Emergency ambulance services are not free of charge for most Australians, but subscription schemes are offered by the ambulance authorities or through private health insurance.

Several state and territory governments have established 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. The Australian Government, with the support of the Council of Australian Governments, has also decided in 2006 to establish a national call centre.

Many Australians purchase health insurance provided by health benefits organisations (more commonly known as private health insurance funds). Unlike other countries such as the United States of America and Germany, Australia has virtually no employer-based health insurance schemes. Australians have a choice of a wide range of private health insurance schemes. Hospital insurance schemes cover services in private hospitals as well as services provided in public hospitals for private patients and associated medical services. These are supplemented by additional schemes that cover a wide range of allied health and other professional services, including some alternative/complementary health services.

In response to a significant decline in health insurance membership towards the end of the last century, the Australian Government introduced various incentives to encourage uptake and retention of private health insurance, the most notable being a 30% rebate on membership fees and the introduction of lifetime cover. As of late 2005, around 8.8 million Australians (43% of the population) were covered by private health insurance for hospital treatment.

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

- activities to ensure food quality
- immunisation services and other communicable disease control (including biosecurity)
- public health education campaigns (including health promotion in the areas of nutrition and physical activity)
- 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.

The health system is 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. The state and territory governments are also largely responsible for industry regulations, such as for 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.

Essential support to the health service system is given by many other agencies. Research and statistical agencies provide the information needed for prevention, detection, diagnosis, treatment, care and associated policy. Consumer and advocacy groups contribute to public discussion and policy. Professional associations for health practitioners set professional standards and clinical guidelines. Universities and hospitals undertake training of 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 part of the health system, many other government and non-government organisations play a role because of their influence on health. Departments of transport and the environment, liquor licensing authorities and the media are just a few examples.

1.6 National health information and how it is governed

Health information is fundamental to developing effective health policies and programs, to ensuring quality provision of services, to coordinating treatment and care and to empowering consumers.

In accordance with Figure 1.2, health information is about:

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

Increasing attention is being given to organising health information to support decision making. The National Health Information Agreement—originally made in 1993—covers the Australian Government Department of Health and Ageing, state and territory health agencies, the Australian Bureau of Statistics (ABS), the Australian Institute of Health and Welfare (AIHW), and the Health Insurance Commission (now Medicare Australia).

A major product of the agreement is the *National health data dictionary*, which is updated annually to provide standards for national health information and to provide guidance for gathering health data. Data standards published in the dictionary are used, for example, in collecting health information to support performance monitoring of the Australian Health Care Agreements between the Australian Government and the state and territory governments.

Priorities for national health information

In 2002, AHMAC endorsed a set of 10 priorities to guide the development of health information for the period 2003–2005. Published in a document entitled *Health information development priorities* (HIDP) (NHIMG 2003), they were:

- Aboriginal and Torres Strait Islander health
- Integration of services—coordinated care
- Safety and quality in health care
- Information technology and health
- Population health
- Equity and access
- Health labour force
- Performance of the health system
- Standards and classification
- Management of health information.

The HIDP was intended to focus the health sector, over a three-year period, on data development in the areas that were lacking health information of sufficient quality and consistency to support policy development and program monitoring.

2005 was the final year of the HIDP, and the bodies responsible for implementing it are reflecting on what has been achieved, with a view to informing their priorities regarding data and information for the future.

Some of the committees responsible for segments of national health information have recently reviewed their past and future activities. For example, the National Advisory Group on Aboriginal and Torres Strait Islander Health Information and Data and the National Public Health Information Working Group have each released strategic plans to guide information development in their fields during the next three years.

Later this year, the AIHW will release a publication that will review achievements in the 10 priority areas for information development in 2003–2005 and summarise the priorities announced for the period 2005–2008.

Governance arrangements for national health information

Figure 1.4 outlines the main decision-making structures for health information in Australia. Two advisory bodies—the Australian Health Information Council (AHIC) and the NHIG—were established in 2003 to provide leadership on information management and technology, and to coordinate advice to AHMAC.

The key role of AHIC is to provide independent advice on long-term directions and strategic reform issues relating to national health information. AHIC gathers views from consumers, health professionals, information technology software developers, and other private stakeholders and experts.

The NHIG was established to advise on planning and management requirements, and to manage and allocate resources for national health information projects and working groups. Membership consists of all Australian jurisdictions, the AIHW and the ABS.

Five standing committees that report to the NHIG are associated with the development of health information for statistical purposes (see Figure 1.4).

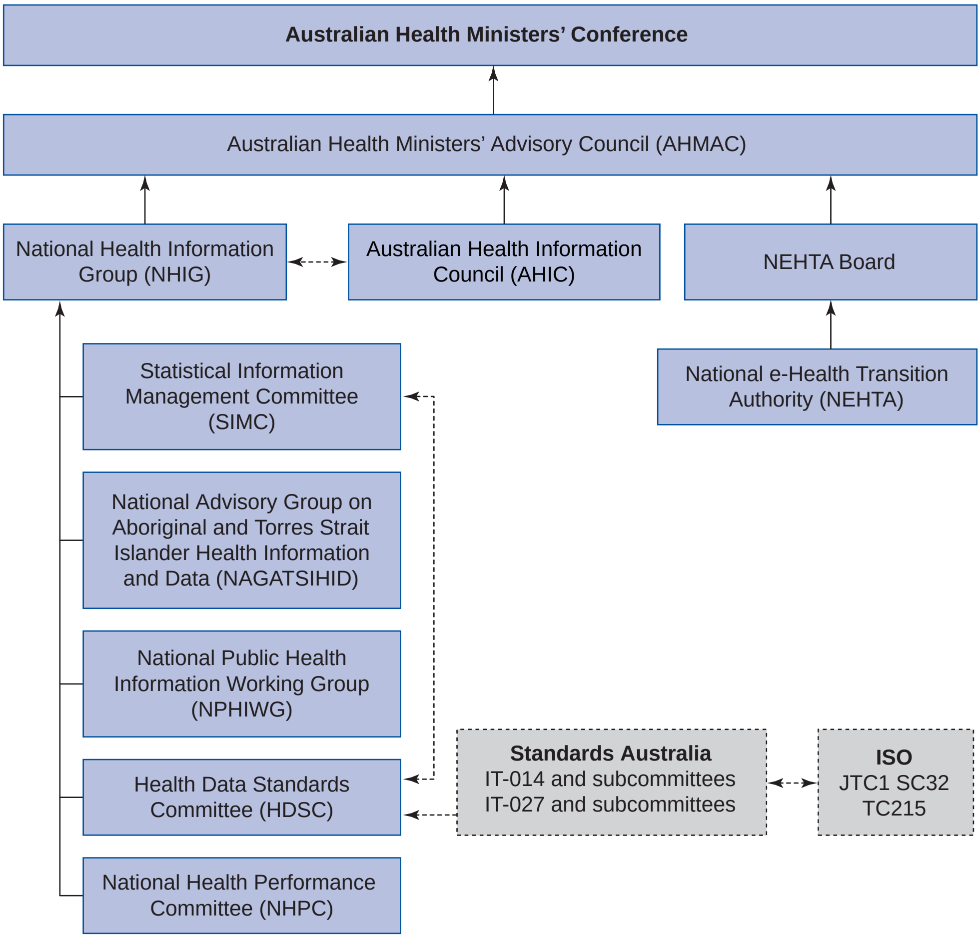


Figure 1.4: Governance for national health information

With the rapidly increasing uptake of electronic health information systems, along with community concern about personal privacy, a key challenge for the health information system is implementing a secure, effective electronic health record that will lead to better health. In 2005, the National e-Health Transition Authority (NEHTA) was incorporated to 'accelerate the adoption of e-health by supporting the process of reform in the Australian health sector'. NEHTA is governed by a board composed of the chief executive officers from each of the Australian, state and territory government health departments. It is responsible for clinical data standards; patient, provider and product identification standards; patient, provider and product directories; supply chain; consent models; secure messaging and information transfer; and technical integration standards.

Australian health ministers have established a new Australian Commission on Safety and Quality in Health Care, which commenced operations on 1 January 2006; it succeeded the Australian Council for Safety and Quality in Health Care, which operated from 2000 to 2005. A key objective of the Commission is achieving safe, effective and responsive care for consumers. This requires, among other things, the development of information about the safety and quality of care in hospitals, primary health care and other parts of the health system.

These governance arrangements are intended to enable a more coordinated, coherent governance of national health information, data collection, data standards and related information communications technology. The aim is that the clinical and statistical aspects of information management and their related standards work be brought together in a more integrated way.

At the time of writing, the structure and roles of some national information committees were under review. The publication that the AIHW will release later this year will also describe the new governance arrangements.

1.7 Structure of this report

The report is broadly structured along the lines of the conceptual framework shown in Figure 1.2.

Chapter 2 reports on the health status of Australians and describes the major diseases and conditions that have an impact on their health.

Chapter 3 focuses on the determinants of health: biomedical and genetic factors, health behaviours, socioeconomic factors and environmental factors.

Chapter 4 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 5 is a special chapter on the health of Australian children. It provides details on demographic trends, health conditions and disability among these young Australians.

Chapter 6 examines health system funding and expenditure, and deals with employment in the health industry. It outlines some of the challenges in resourcing a complex system.

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.

Statistical tables covering a range of topics are included after Chapter 7. These tables contain data on population and fertility as well as health-related information. 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 given at the end of the report.

Following the Glossary are the National Health Sector Performance Indicators. These indicators are described, and referenced to tables, figures and sections in the report itself.

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AIH (Australian Institute of Health) 1988. Australia's health 1988. Canberra: AGPS.

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2 Health of Australians

The health of the Australian population is continually improving. Australians are now living longer than ever before. There have been large reductions in morbidity and mortality from communicable diseases; notable improvements have also been observed for a variety of chronic diseases and injuries over the last several decades. The impact of these changes is visible in almost all segments of the population, although not uniformly so.

This chapter provides an overview of the health of the Australian population as a whole. The concept of population here is not limited to any particular class or characteristic but includes all Australians without regard to any special features. The health of populations defined by a particular characteristic, such as country of birth, age group, socioeconomic status and so forth, is described in Chapter 4.

The chapter is organised into 10 major sections, as follows:

2.1 Demographics
2.2 Health and functioning
2.3 Morbidity and illness
2.4 Disability
2.5 Causes of death
2.6 Non-communicable diseases
2.7 Mental health problems and illnesses
2.8 Communicable diseases
2.9 Injury in Australia
2.10 Summarising the burden of disease

The first five sections of the chapter describe the health of the Australian population in general dimensions, namely life expectancy, population ageing, self-assessment of health, illness, disability and mortality. Sections 2.6 to 2.9 provide surveillance summaries of a variety of diseases (non-communicable and communicable), mental problems and illnesses, and injuries, as well as describing their individual effects on the Australian population. The last section summarises the impact of various diseases and injuries on the health of the population using the disability-adjusted life years (DALY) measure, developed by the World Bank and the World Health Organization (WHO) (World Bank 1993) and applied to the Australian situation by the Australian Institute of Health and Welfare (AIHW: Begg et al. in press; AIHW: Mathers et al. 1999).

2.1 Demographics

An important aspect of monitoring a population's health is to track its demographic structure: how large is the population, what is the ratio of males to females, and what is its age composition? These characteristics reflect past demographic events but they also influence present and future health.

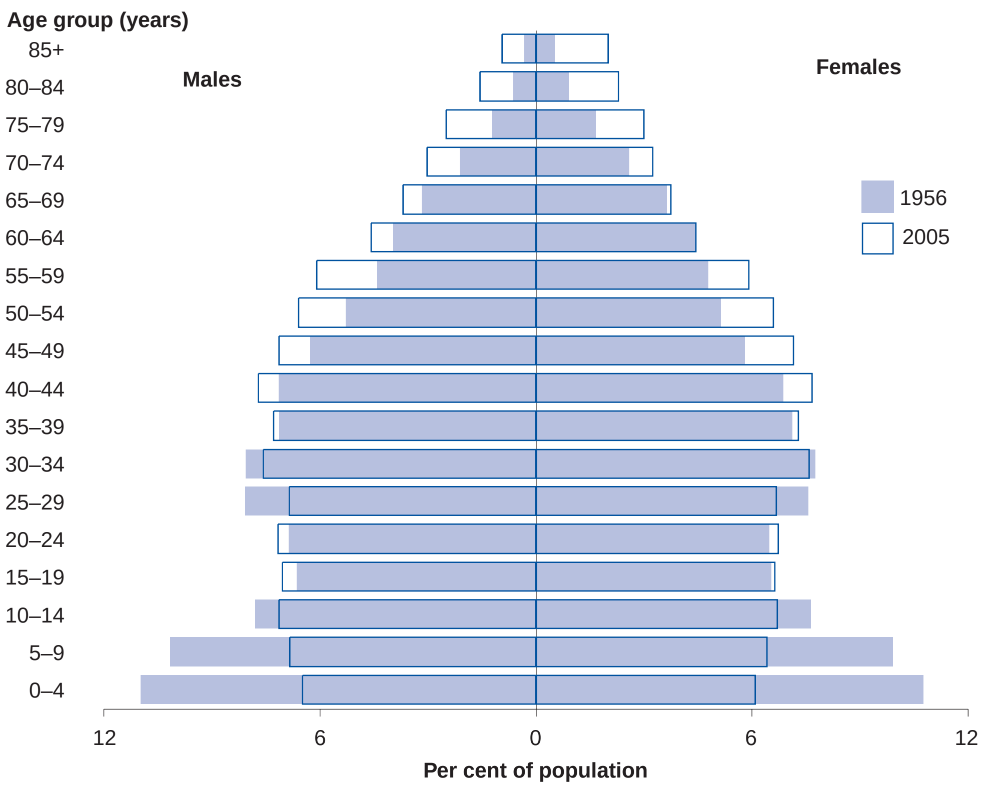
Other demographic features that provide good insights to a population's health are fertility, mortality and life expectancy. Birth and death rates are major drivers of a population's structure. Immigration is another contributor. Life expectancy summarises the outlook on life based on current mortality patterns.

A continually ageing population, for example, is much more than a demographic outcome. In the context of health, population ageing translates into higher overall morbidity and mortality, and an increasingly older population will place greater demand on health care facilities.

Age and sex structure

The estimated resident population of Australia was 20.3 million in June 2005 (ABS 2005a). Since Federation in 1901, the population has increased by 16 million, with over 2 million added over the past decade. Natural increase has been the main component of growth, contributing around two-thirds in the past 50 years. Net overseas immigration has contributed to the remainder of the increase.

Two major features of demographic transition in Australia have been declining fertility and declining mortality. The decline in fertility since the 1960s has led to slow growth of the population in younger ages, whereas declining mortality has contributed to significant increases in the number of old people. Figure 2.1 shows this change in the age structure, from its pyramid-like look in 1956 to its present beehive shape.



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

Source: ABS 2005a.

Figure 2.1: Age structure of the Australian population, 1956 and 2005

Since 1979, females have outnumbered males. In 1956, there were 2.7% more males than females in Australia's population, while in 2005 there were 1.1% more females than males. This crossover reflects significant gains in the health of females, compared to males. However, the gap appears to be reducing with relatively greater increases to male life expectancy in the past 20 years.

Median age

The median age is the mark at which half the population is older and half is younger, and for Australia in 2005 it is estimated to be 36.6 years, having increased by 5.8 years in the last two decades (ABS 2005a). The Australian median age is much younger than in some developed countries, for example Japan (42.9 years) and Italy (42.3).

The older population

During the past several decades, the number and proportion of the population aged 65 years or over have increased rapidly in Australia. The increase in the population aged 85 years or over was even more marked.

In 2005, more than 2.6 million Australians were aged 65 years or over, representing 13.1% of the total population (Table 2.1). The proportion is similar to that in the United States and Canada but is substantially lower than in Japan and Italy.

The proportion of those aged 85 years or over was 1.5% of the total population and for those aged 65 years or over it was 13%. There were 5,178 Australian centenarians and over 110,000 persons aged 90 years or over in 2005.

Table 2.1: Estimated resident population, ages 65 years or over, 2005

	Males		Females	
Age group (years)	Estimated resident population	Per cent of population	Estimated resident population	Per cent of population
65–69	382,427	3.8	389,377	3.8
70–74	300,026	3.0	327,001	3.2
75–79	251,725	2.5	301,262	2.9
80–84	162,847	1.6	238,309	2.3
85–89	70,712	0.7	132,463	1.3
90–94	24,350	0.2	61,292	0.6
95–99	5,050	0.05	15,982	0.2
100 and over	1,728	0.02	3,450	0.03
Total (65 years or over)	**1,198,865**	**11.9**	**1,469,136**	**14.4**
Total, all ages	**10,110,836**	**100.0**	**10,217,773**	**100.0**

Source: ABS 2005b.

Fertility

The total fertility rate in Australia has fallen below the replacement level of 2.1 births for the past quarter of a century, as in most developed and an increasing number of developing countries (ABS 2006a). The fertility rate is the number of babies, on average, that a woman could expect to bear during her lifetime if she experienced current age-specific fertility rates throughout her childbearing life. In 2004, the Australian total fertility rate based on birth registration was 1.8 births (ABS 2006a). The decline had a strong effect on the age structure of the population. However, the rate has now levelled off and may be even beginning to rise (McDonald 2005).

Another indicator of Australia's fertility is the median age of mothers at first birth. In 2004, the median age at birth was 30.6 years (ABS 2005c). Fertility rates in Australia now peak in the age group 30–34 years, at 114 babies per 1,000 females, with the second highest fertility rate among those aged 25–29 years. The fertility rate of females aged 20–24 years has halved since 1980 to 53 babies per 1,000 females.

The upward shift in the age of mothers at first birth has contributed to the declines in the total fertility rate. However, a balance may now have been reached in these two interrelated aspects of fertility.

Mortality

Mortality is another key determinant of a population's age structure. Cause-specific mortality also provides insights into health events around the time of death. (For further information on causes of death in Australia, see Section 2.5.)

There were 132,508 deaths recorded in Australia in 2004. Male deaths outnumbered female deaths, 68,395 to 64,113. The crude death rate ratio was 108 males to 100 females (Table 2.2). About 75% of male and 85% of female deaths in 2004 were of persons aged 65 years or over. The median age at death was 76.6 years for males and 82.6 years for females.

Table 2.2: Age- and sex-specific distribution of deaths, 2004

	Males		Females		Sex ratio	
Age group (years)	**Number**	**Rate[(a)]**	**Number**	**Rate[(a)]**	**Crude[(b)]**	**Rate ratio[(c)]**
<1	678	524.6	506	415.4	134	126
1–14	340	17.8	229	12.6	148	141
15–24	940	66.4	410	30.4	229	218
25–44	3,656	124.6	1,759	59.7	208	209
45–64	11,612	477.1	6,971	286.8	167	166
65–84	36,532	3,408.1	28,190	2,278.2	130	150
85+	14,631	15,635.9	26,047	12,892.7	56	121
Missing age	6	. .	1	. .	. .	. .
Total	**68,395**	**684.6**	**64,113**	**634.7**	**107**	**108**

. . 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.

Source: AIHW National Mortality Database.

Death rates are declining in Australia. The female age-standardised death rate fell by 72%, from 1,844 per 100,000 in 1907 to 511 in 2004. The corresponding male death rate fell by 65%, from 2,234 to 770 per 100,000. These mortality reductions have occurred in several different phases. Large reductions in infant mortality and in the 0–4 year death rate preceded declines in death rates in middle age groups. The death rates subsequently began falling among those aged 65 years or over (Figure 2.2).

Source: AIHW National GRIM Books.

Figure 2.2: Trends in death rates, selected age groups, 1907–2004

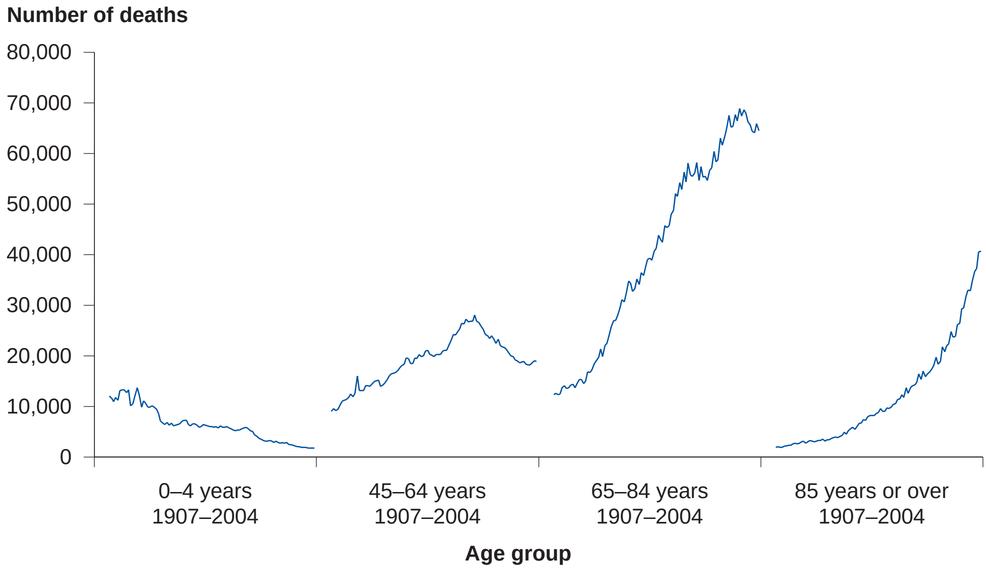
Reductions in death rates do not necessarily mean a lower death count. The annual number of deaths in Australia increased from 45,305 in 1907 to 132,508 in 2004. While much of this increase reflects population growth, some of it is due to more people getting close to the upper end of the life span.

The number of deaths has also varied greatly in different age groups during this period (Figure 2.3). For example:

- The number of deaths of children aged 0–4 years declined from 13,000 in 1907 to less than 1,500 in 2004. Mortality in this age group accounted for around a quarter of all deaths at the beginning of the 20th century.
- The number of deaths in the 65–84 years age range began falling in 1996, from 68,292 deaths to 64,722 in 2004.
- While the bulk of deaths in Australia currently occur among those aged 65–84 years, the number of deaths in the 85 years or over group is increasing rapidly. This latter group will be the category with the largest number of deaths sometime in the future.

Life expectancy

Life expectancy at birth is the average number of years a newborn can expect to live if the existing mortality patterns prevail over the individual's lifetime. At other ages, life expectancy denotes the additional number of years a person may expect to live, on average (Box 2.1). Life expectancy is one of the most commonly used summary indicators of a population's health. Calculated as it is using current death rates, life expectancy also summarises the mortality pattern obtained in a population.



Source: AIHW National GRIM Books.

Figure 2.3: Trends in death numbers, selected age groups, 1907–2004

A direct consequence of declining death rates, as described earlier, is that Australians enjoy one of the highest life expectancies in the world. Australian females born in 2002–2004 could expect to live an average of 83.0 years while a male could expect to live 78.1 years.

Box 2.1: 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 is based on the prevailing mortality patterns in a population; the calculation assumes that the current death rates will persist throughout the life span. The life expectancy of newborns is based on age-specific death rates that year and not on future, projected death rates.

In this report, life expectancy is expressed as the total number of years a person may expect to live 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 82.5 years, rather than 17.5 years.

Life expectancy at different ages

With each year lived, life expectancy increases. This is because, as age-specific, life-threatening factors are overcome, the opportunity to survive improves. Early in the 20th century, when death rates were high in the younger age groups, this gain was substantial upon surviving the first few years of life. The gain remains but is much smaller at present because infant mortality rates are not much higher than those in later childhood.

The calculation of life expectancy at birth takes into consideration factors affecting the full course of life, including the relatively higher death rates in early years of life. Some of these factors do not extend beyond those early years. Persons at age 30 years would have overcome many of these early risk factors and therefore would have an increased life expectancy. In 2002–2004, life expectancies for 30-year-old females and males were 83.8 years and 79.4 years, respectively about 0.8 years and 1.3 years greater than at birth.

These increments in life expectancy with age continue into the later years of life as well. Australian females and males aged 65 years in 2002–2004 could look forward to living up to the ages of 86.1 years and 82.5 years, respectively; again, substantially greater than those obtained at birth and at age 30 years. For those aged 85 years, life expectancy increased to 91.9 years for females and 90.7 years for males in 2002–2004 (Table 2.3). The calculation of life expectancies at ages 65 years and 85 years takes into account only those risk factors that have an impact in later years of life.

Table 2.3: Life expectancy at different ages, 1901–1910 and 2002–2004

	Males			Females		
Age	1901–1910	2002–2004	Per cent Increase[a]	1901–1910	2002–2004	Per cent Increase[a]
Birth	55.2	78.1	41.5	58.8	83.0	41.2
30 years	66.5	79.4	35.3	69.3	83.8	36.9
65 years	76.3	82.5	54.9	77.9	86.1	63.6
85 years	87.7	90.7	111.1	89.2	91.9	64.3
Gap[b]	32.5	12.6	. .	30.4	8.9	. .

(a) The life expectancy (remaining years) for an age in 2002–2004 expressed as a percentage increase over the remaining years for the same age in 1901–1910. For example, at age 85 years the percentage increase for males = 100 x ((90.7–85) – (87.7–85)) / (87.7–85).

(b) Gap between life expectancy at birth and at age 85 years.

Sources: ABS 2005d; ABS unpublished data.

Trends in life expectancy

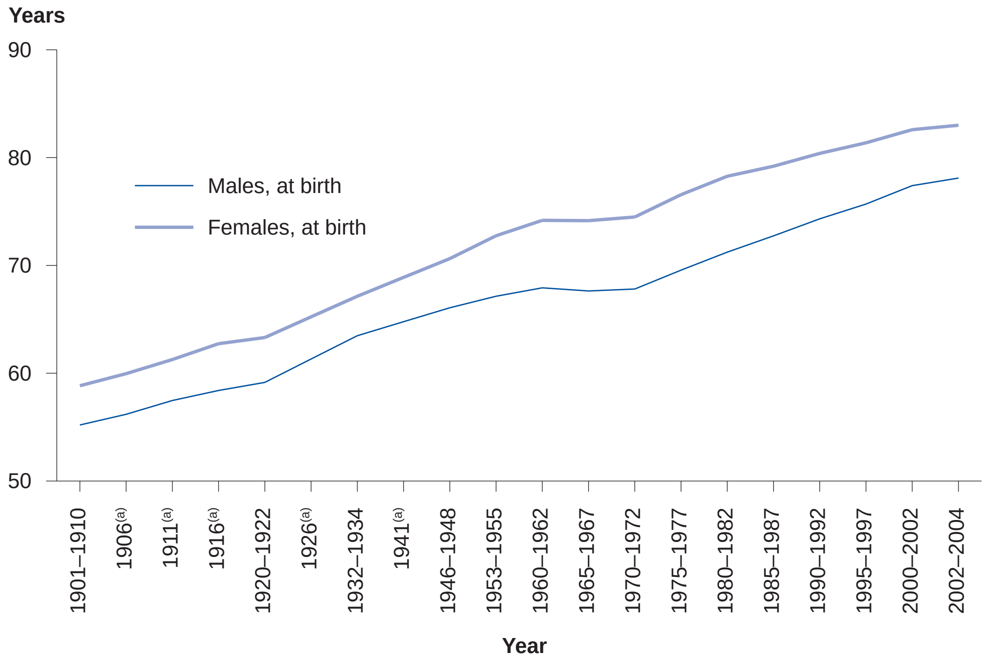
Life expectancy in Australia has been increasing. Apart from a period around 1960–1970, when the death rates for heart disease were at their peak, life expectancy improved continually throughout the last century and into this century (Figure 2.4).

The overall increase in life expectancy at birth between 1901–1910 and 2002–2004 was about 42%. For females, the increase was 24.2 years—from 58.8 years to 83.0 years. For males, it increased by 22.9 years—from 55.2 years to 78.1 years (Table 2.3).

Male life expectancy has been consistently lower than for females all through this period, although the size of the difference has varied. In 1901–1910, the differences were

3.6 years and 1.6 years, at birth and at age 65 years, respectively. The largest difference between male and female life expectancies occurred during 1980–1982, with a gap of 7.0 years at birth. The gap was 4.2 years for those aged 65 years.

Since then, the gaps have reduced markedly, to 4.9 years at birth and 3.6 at age 65 years, in 2002–2004.



(a) Prorated for missing years.

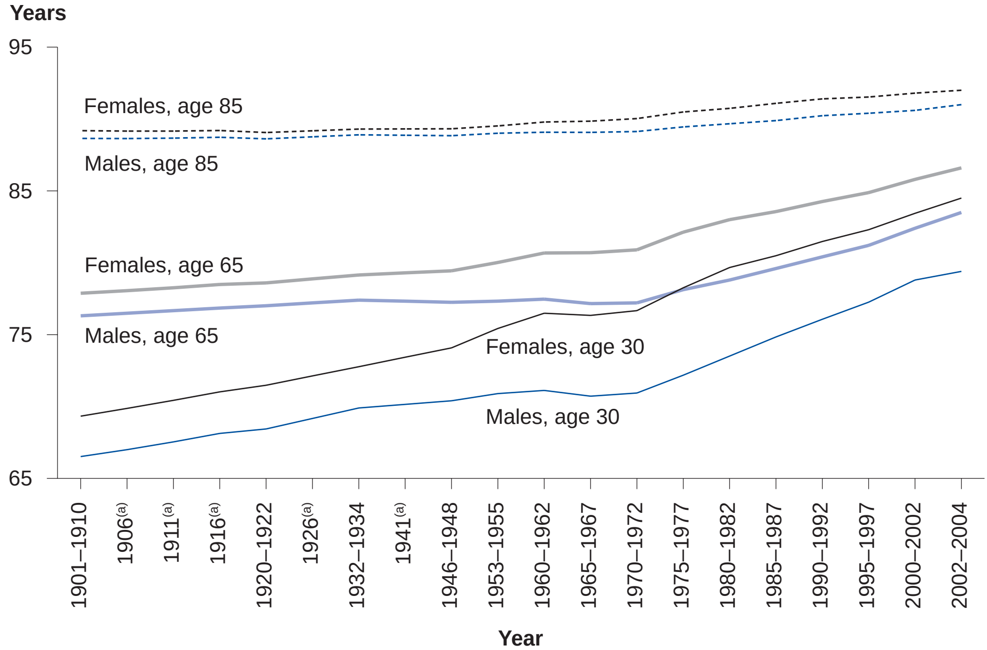
Sources: ABS 2005d; AIHW Population Database.

Figure 2.4: Trends in life expectancy at birth, 1901–1910 to 2002–2004

Early in the 20th century, improvements in life expectancy were at middle or younger ages, with reductions in infant and child mortality being the major contributors. Consequently, the gap between life expectancies at birth and at age 65 years has reduced markedly (Table 2.3). However, over the past few decades, reductions in mortality at older ages have also contributed substantially to the increases in life expectancy (Figure 2.5).

The varying changes in life expectancy at different ages are due to a major shift in deaths to older ages (sometimes referred to as 'compression of mortality'). In 1901–1910, the gap between life expectancy at birth and at age 85 years was 30.4 years for females and 32.5 years for males; by 2002–2004, these gaps had reduced to 8.9 years and 12.6 years, respectively (Table 2.3).

The life expectancies at other ages have also shown varying trends. While the changes at age 30 years are broadly similar to those at birth (Figure 2.5), the course of life expectancy at age 65 years was different. Little change in life expectancy occurred at age 65 years until the 1970s but from then on it has consistently improved. Some improvements in life expectancy have also occurred for persons aged 85 years from the 1970s.



(a) Prorated for missing years.

Sources: ABS 2005d; AIHW Population Database.

Figure 2.5: Trends in life expectancy at various ages, 1901–1910 to 2002–2004

International comparisons of life expectancy

Overall, Australians enjoy one of the highest life expectancies in the world (WHO 2005a). Table 2.4 compares Australia with a range of other countries. (Note that the estimates of Australian life expectancy differ from those provided in earlier pages, because of a different method used by the WHO for calculating life expectancy.)

Newborn Australians could expect to live a little longer than those in countries such as Canada, New Zealand, Norway and Spain—and longer again than in the United Kingdom and the United States. The WHO has estimated that the Australian male life expectancy in 2003 (78 years) was among the world's highest. Similarly, female life expectancy in Australia (83 years) was not far behind that in the countries with the highest life expectancy—Japan (85 years), France and Italy (both 84 years).

Table 2.4: Life expectancy at birth for selected countries, 2003

Country	Males	Females
Japan	78	85
Italy	78	84
France	76	84
Australia	**78**	**83**
Sweden	78	83
Switzerland	78	83
Spain	76	83
Canada	78	82
Iceland	78	82
Singapore	78	82
New Zealand	77	82
Norway	77	82
United Kingdom	76	81
United States of America	75	80

Source: WHO 2005a.

2.2 Health and functioning

Health and functioning are multidimensional concepts relating to peoples' body functions and structures, the activities people do and the life areas in which they participate. Environmental factors also affect these experiences. Good health and functioning may be described as states characterised by an ability to perform daily tasks with vigour and a low risk of developing disease or disability.

This section attempts to describe some of the common aspects of health and functioning. However, in the absence of quality data, the focus of the section is limited to self-assessed health status, sexual and reproductive health, and oral health. Other sections of this chapter cover the more traditional topics of disease, disability and mortality.

Self-assessment of health

Individuals' rating of their own overall health is often used as one of the indicators of health status and is sometimes used as a predictor of health care use and mortality.

Self-rating information is collected in many national and state-wide surveys in Australia. The Australian Bureau of Statistics' (ABS) National Health Survey (NHS) asks respondents to assess their health against five grades, from excellent through to poor. Several other surveys generate similar information.

In 2004–05, 56% of NHS respondents aged 15 years or 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). The ratings by males and females showed similar patterns.

The patterns of self-rating varied with age but were similar for males and females. More people in the younger age groups assessed their health as very good or excellent, compared with those in the older age groups (Figure 2.6). The proportion of those assessing their health as poor increased with age, from 1% of those aged 15–24 years to 13% of those aged 75 years or over.

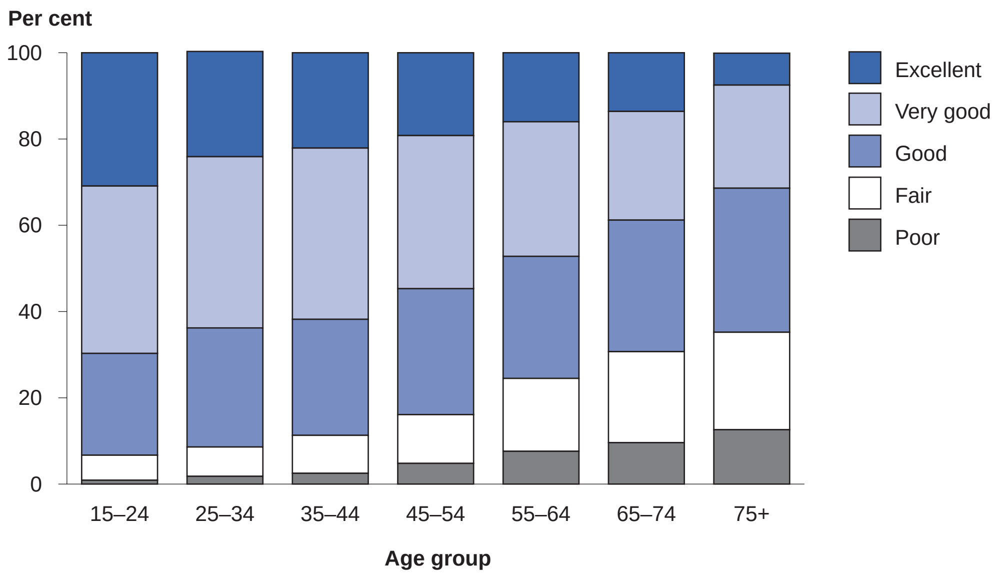
Table 2.5: Trends in self-assessed health status(a)(b), 1995, 2001 and 2004–05 (per cent)

Self-assessed health status	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 30 June 2001.

(b) Persons aged 15 years or over.

Source: ABS 2006b.



Source: ABS 2006b.

Figure 2.6: Self-assessed health status, by age, 2004–05

The majority of adults (92%) who assessed their health as good or better rated it as the same or improved in the preceding 12 months (Table 2.6). This change in health status information is based on the 2001 NHS. Of those who assessed their health as fair, 70% indicated either no change or an improvement in health. Just over half of those who assessed their health as poor reported a decline in their health compared to one year previously (51%). Overall, however, 87% of those aged 18 years or over rated their health as the same or improved compared with one year previously.

Table 2.6: Changes in health status[(a)], 2001 (per cent)

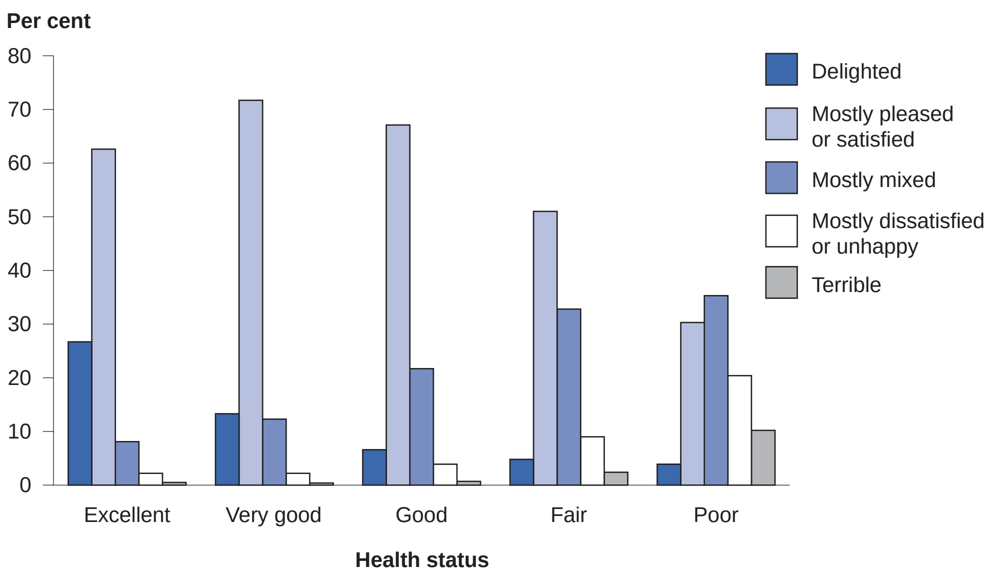
Self-assessed health status	Self-assessed health status[(b)]				
	Much better	Better	Same	Worse	Much worse
Excellent	7.8	10.5	79.7	1.9	0.1
Very good	8.6	13.9	71.7	5.7	0.2
Good	7.4	15.7	62.6	13.2	0.9
Fair	4.2	15.2	50.5	26.1	3.9
Poor	2.3	11.5	35.6	29.0	21.6
Total	**7.2**	**13.9**	**65.6**	**11.3**	**2.0**

(a) Persons aged 18 years or over.

(b) Compared to one year ago.

Source: AIHW analysis of ABS 2001 National Health Survey data.

There is an association between the self-assessed level of health and feelings about life (Figure 2.7), with those reporting good or better health being more likely to report positive feelings and satisfaction. About 82% of adults in the 2001 NHS who rated their health as good or better either said they were mostly pleased or satisfied, or delighted, with their life. By contrast, only 50% of those who rated their health as fair expressed similar satisfaction. The proportion was much lower (36%) among those who had assessed their health as poor. It should be noted that these observations cannot determine whether feeling healthy brings more satisfaction, vice versa, or both.



(a) Persons aged 18 years or over.

Source: AIHW analysis of ABS 2001 National Health Survey.

Figure 2.7: Self-assessed health status, by satisfaction with life[(a)], 2001

The 2004–05 NHS also confirmed that the more long-term conditions a person has, the more likely they are to rate their health unfavourably (Table 2.7). For example, about 63% of persons reporting two long-term conditions assessed their health as excellent or very good, compared with 74% of those reporting no long-term condition and 49% of those reporting four long-term conditions.

Table 2.7: Self-assessed health status, by number of long-term conditions[(a)], 2004–05 (per cent)

Self-assessed health status	Number of long-term conditions					
	None	One	Two	Three	Four	Five or more
Excellent/very good	74	71	63	55	49	30
Good	22	24	29	32	33	31
Fair/poor	4	5	8	13	18	39
Total	**100**	**100**	**100**	**100**	**100**	**100**

(a) Persons aged 18 years or over.

Source: ABS 2004–05 National Health Survey data.

The relationship between reported long-term conditions and self-assessed health may vary with the type of condition (Table 2.8). For example, persons with diabetes or ischaemic heart disease were less likely to assess their health as excellent or very good (19% and 10%, respectively) in comparison with those with asthma (42%) and back pain (42%).

Table 2.8: Self-assessed health status, by selected long-term conditions[(a)], 2004–05 (per cent)

	Self-assessed health status		
Disease/condition	Excellent/very good	Good	Fair/poor
Diabetes	19	33	58
Asthma	42	31	27
Neoplasms	25	30	45
Mood disorders	30	31	39
Ischaemic heart disease	10	27	63
Back pain and disc disorders	42	31	27
Osteoarthritis	33	30	37

(a) Persons aged 18 years or over.

Source: ABS 2004–05 National Health Survey data.

Self-assessed health was also rated less favourably by those with certain risk factors (Table 2.9). Persons who were overweight or obese were less likely to assess their health as excellent or very good than those whose weight was in the normal range. Similarly, smaller proportions of smokers assessed their health as excellent or very good than did non-smokers. This pattern also applied to those who reported not walking in the preceding week compared with those who did walk.

Table 2.9: Self-assessed health status, by selected risk factors[(a)], 2004–05 (per cent)

		Self-assessed health status				
Risk factor	**Variable**	**Excellent**	**Very good**	**Good**	**Fair**	**Poor**
Body weight	Normal weight range	26	37	25	9	4
	Overweight or obese	15	35	31	14	5
Whether walked in last week	Yes	22	38	27	10	3
	No	17	33	30	14	6
Smoker status	Current daily smoker	12	33	34	14	7
	Never smoked	24	36	27	10	3

(a) Persons aged 18 years or over.

Source: ABS 2004–05 National Health Survey data.

Sexual and reproductive health

Sexual health and reproductive health together form an important component of human health. Sexual health is the enjoyment of sexual activity of one's own choice without causing or suffering physical or mental harm (Renton et al. 1997). Sex and sexuality are a normal aspect of human functioning, and pervade many aspects of a person's overall health and behaviours. Sexual activity in turn is an important component of human reproduction and family formation.

Quantitative information on the sexual and reproductive health of Australians is available in a variety of data sources. A national survey, the Australian Study of Health and Relationships (ASHR), carried out in 2001–02 and broadly representative of age 15–59 years, is an important source. A variety of information is also available from the ABS National Health Surveys, the Bettering the Evaluation and Care of Health (BEACH) Survey of General Practice Activity, the National Hospital Morbidity Database, the National Perinatal Data Collection and the National Notifiable Diseases Surveillance System.

Information has been derived from several of these data sources to generate the following profile of the sexual and reproductive health of Australians.

Sexual behaviour and family formation

The ability to choose whether, when and how often to reproduce, and to exercise those choices with confidence and in safety, has been enhanced over the past half century. The introduction of improved methods of contraception and more accessible, safe abortion has affected, and in turn was affected by, changes in attitudes towards sexuality and reproduction. Various social and economic factors have also influenced decisions about marriage and the timing, spacing and number of children. These influences impinged upon and were further transformed by changes in laws and custom. Australian women are increasingly delaying marriage and postponing childbearing. This reflects changing attitudes towards both sex and having children. Changing sexual behaviours and sexual norms are also an important part of sexually transmitted infections.

In the ASHR, the median age of reported first intercourse was 16 years. About 40% of males and one-quarter of females reported having had intercourse when they were below the age of 16. The median age at first marriage in Australia was 28 years for women and 29 years for men in 2004 (ABS 2004a). The proportion of births occurring within a registered marriage was 68%. Cohabitation now precedes marriage for 76% of couples (ABS 2004a). Among the births to unmarried parents, the father was identified in 89% of cases. Some 20 years earlier, paternity was identified in only two-thirds of births to unmarried mothers (ABS 2005c).

Excluding those who were pregnant or attempting to become so, and those who for various other reasons had no need of contraception, only 13% of women were at risk of an unplanned pregnancy in 2001–02 (Richters et al. 2003a).

Use of contraception

The use of contraception is common, with some 71% of respondents to the Australian Study of Health and Relationships having used some form of contraception (Smith et al. 2003). The types used are many and varied, including non-medical, medical or surgical. Sterilisation (male or female) was the most commonly used method (41.8%), with oral contraceptives and/or the condom also widely used (Table 2.10). Other forms of contraception used were diaphragms, intra-uterine devices, injectables and tubal occlusion devices, as well as post-coital or emergency contraception.

Table 2.10: Methods of contraception used by females, 2001–02

Contraception method	Per cent
Sterilisation	
Tubal ligation/hysterectomy	22.5
Male partner has vasectomy	19.3
Subtotal (sterilisation)	*41.8*
Oral contraceptive	33.6
Condom	21.4
Withdrawal	4.5
Safe-period method	4.4
Injectables	1.5
Intra-uterine devices	1.2
Progesterone implants	1.1
Diaphragms and caps	0.9
Spermicidal foam or jelly	0.2
Female condom	<1.0

Note: Sample size (n=6,275); the total adds to more than 100% because women could report use of more than one method.

Source: Richters et al. 2003a.

Medicare fee-for-service benefits were paid for about 24,000 vasectomies and 4,500 tubal ligations in 2004–05. The number of services for which benefits were paid has fallen since 2000–01 by 30% for tubal ligation and by 12% for vasectomy. These figures exclude services provided to public patients in hospitals and through other publicly funded programs.

In addition to services provided by general practitioners (GPs) and gynaecologists, family planning organisations provide services to promote the sexual and reproductive health of Australians, particularly for those who cannot or prefer not to access such services through GPs and gynaecologists. The available services (heavily concentrated in urban areas) include clinic services for individual clients; community education programs, both direct and through training and resourcing of teachers and community workers; and education and training of GPs and nurses.

Maternal age

An upward trend in maternal age has been shown in Australia in recent years. In 2003, the average age of all women who gave birth was 29.5 years, compared with 28.3 years in 1994. The average age of first-time mothers was 27.6 years in 2003. Mothers aged under 20 years constituted 4.6% of all mothers. Those aged 35 years or over accounted for 18.8% of mothers in 2003, an almost 50% increase on the proportion in 1994 (12.7%).

Method of birth

Of the 252,584 women who gave birth in Australia in 2003, almost two-thirds (60%) had a spontaneous vaginal birth; 28% had a caesarean section and 11% had a forceps, vacuum extraction or vaginal breech delivery (Table 2.11). Obstetric intervention generally occurs if serious complications arise during pregnancy or labour.

There was much variation in the methods of birth across Australian states and territories. The proportion of women who had spontaneous vaginal births varied from 57% to 64%. There were also significant differences between states and territories in the use of forceps and vacuum extraction. Victoria recorded the highest percentage of forceps delivery (6.4%), and Queensland the lowest (2.0%). The percentage of women who had vacuum extractions ranged from 5.7% in the Northern Territory to 9.0% in both Western Australia and the Australian Capital Territory.

Table 2.11: Method of birth, all mothers[(a)], 2003 (per cent)

Method of birth	National average	Inter-jurisdictional range
Spontaneous vaginal	60.3	57.0–63.7
Forceps	3.9	2.0–6.4
Vacuum extraction	6.8	5.7–9.0
Vaginal breech	0.4	0.3–1.0
Caesarean section	28.5	25.2–30.9

(a) The total number of mothers in 2003 was 252,584.

Note: For multiple births, the method of birth of the first-born baby was used.

Source: AIHW NPSU: Laws & Sullivan 2005.

The proportion of women having caesarean sections has increased markedly, from 19.4% nationwide in 1994 to 28.5% in 2003 (AIHW NPSU: Laws & Sullivan 2005). The proportion of caesarean section deliveries was 30% or more in Western Australia, Queensland and South Australia. The Australian Capital Territory reported the lowest proportion (25.2%) of caesarean sections.

Aboriginal and Torres Strait Islander mothers

Aboriginal and Torres Strait Islander females become mothers at a younger age than the overall female population, with an average age when giving birth of 24.8 years in 2003. More than one in five (22.7%) Indigenous mothers were aged under 20 years, compared with 3.9% of non-Indigenous mothers.

Aboriginal or Torres Strait Islander mothers had higher rates of spontaneous vaginal birth (71.0%) than non-Indigenous mothers (59.9%). Caesarean section deliveries occurred in 23.3% of Indigenous mothers, compared with 28.8% of non-Indigenous mothers.

Assisted reproductive technology

Almost 5% of Australian couples are affected by subfertility, where male or female conditions exist (Foran 2005). Causes of infertility include male sperm factors, ovulation disorders, tubal disease, endometriosis and some uterine abnormalities. A variety of assisted conception techniques has been developed, collectively referred to as assisted reproductive technology or ART.

In Australia, ART has been used since 1979. In addition to inducing ovulation, artificial insemination and fertility surgery, ART procedures used include:

- in-vitro fertilisation (IVF), where eggs and sperm are combined in the laboratory for fertilisation outside the body and then replaced in the uterus
- intra-cytoplasmic sperm injection (ICSI), where a single sperm is injected into an egg for fertilisation outside the body and then replaced in the uterus
- gamete intra-fallopian transfer (GIFT), where eggs and sperm are placed in the uterus for fertilisation inside the body.

The embryos arising from the IVF and ICSI methods can be frozen, and later thawed and used in subsequent ART treatment.

The success of ART varies by treatment procedure and whether fresh or thawed embryos or gametes are used. In 2003, with the transfer of fresh embryos or gametes, a viable pregnancy (a pregnancy of at least 20 weeks gestation) was achieved in 23.4% of all IVF egg retrieval cycles, 22.3% of ICSI cycles and 11.6% of GIFT cycles. With the transfer of thawed embryos, a viable pregnancy was achieved in 15.2% of all embryo transfer cycles. When all ART techniques involving embryo transfer or GIFT are combined, viable pregnancy was achieved in 19.5% of cycles.

The average age of women giving birth after ART treatment in 2003 was 34.3 years, 4.8 years older than the average age of all Australian mothers who gave birth. ART mothers had a higher incidence of caesarean section (50.8% of ART mothers compared with 28.5% of all mothers in 2003).

Of ART pregnancies resulting in delivery in 2003, 17.5% were twin and less than 1% were triplet pregnancies. These proportions are markedly different from those without the ART treatment, where only 1.7% of pregnancies resulting in delivery were twin and 0.03% were triplet or higher order pregnancies in 2003.

Maternal mortality

Maternal deaths are rare in Australia (approximately 30 per year). They are classified into direct deaths (deaths from pregnancy complications), indirect deaths (deaths from pre-existing diseases complicated by pregnancy) and incidental deaths, where the pregnancy is unlikely to have contributed significantly to the death.

During the three-year period 1997–1999, there were 90 deaths, a 10% decrease from the previous three years when 100 deaths were reported. The main causes of maternal death in this period were obstetric haemorrhage, amniotic fluid embolism, hypertensive disorders, pulmonary thromboembolism, psychiatric causes and injury. Direct deaths accounted for 37.8% and indirect deaths for 31.1% of all maternal deaths during 1997–99 (AIHW NPSU: Slaytor et al. 2004).

Induced abortions

There is no single comprehensive national data collection resulting from mandated notification of induced abortion in Australia. Legislation relating to induced abortion and the requirement to notify it varies among the states and territories (de Crespigny & Savulescu 2004; Petersen 2005). Notification is not required in New South Wales, Victoria, Queensland, Tasmania, the Northern Territory or the Australian Capital Territory.

Induced abortion may be defined as the termination of pregnancy through medical or surgical intervention (FIGO 1999; WHO 2005b). The number in Australia has been estimated using two different sources. The first is based on data from the AIHW National Hospital Morbidity Database for admitted patients in all states and territories. The second is 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).

There were an estimated 84,218 induced abortions in Australia in 2003, with a rate of 19.7 per 1,000 females aged 15–44 years. Females aged 20–24 years had the highest rate of induced abortions (32.7 per 1,000 females) and the lowest rate was for those aged 40–44 years (6.7 per 1,000 females).

Use of health services

Statistics on hospital separations provide additional information on the extent of morbidity related to pregnancy. Complications of pregnancy, labour and delivery, the puerperium, and pregnancies with abortive outcomes, account for more than 8% of all hospital separations for women.

A further group of sexual or reproductive health conditions accounted for almost 8% of total hospital separations in 2003–04. The largest proportion, 5.7% of total separations, was for diseases of the female pelvic organs and genital tract; the remainder was for diseases of the male genital organs and of the breast (mostly female).

Among the reasons given by patients for a GP visit in 2003–04, sexual and reproductive health issues made up 6.5% of the total.

The reasons for GP encounters in relation to these issues are described in Table 2.12.

Table 2.12: Reasons for GP encounters: sexual and reproductive health issues, 2004

Reason for encounter	Per cent[(a)]
Female genital system	3.4
Check-up/Pap smear	1.2
Pregnancy/family planning	2.4
Oral contraception	0.7
Pre- postnatal checks	0.6
Male genital system	0.7

(a) Per cent of main reasons for encounter.

Source: BEACH survey.

The prescribing of oral contraception by GPs in 2003–04 showed a significant increase over the previous year. The authors suggest that the increase in oral contraceptive use may be partly explained by a move away from the use of injected forms of contraception following medical indemnity issues (AIHW 2004a).

Health of reproductive organs

Sexual difficulties

Almost one-fifth of 50–59-year-old male respondents to the Australian Study of Health and Relationships, and 12.5% of those aged 40–49 years, reported difficulty maintaining an erection during at least one month in the past year (Richters et al. 2003b). However, only 5.2% of the former and 1.4% of the latter had used treatment to aid erections.

Reports of vaginal dryness ranged from 7% among females aged 16–19 years to more than one-third of those aged 50–59 years. Pain during intercourse declined from 25% of females aged 16–19 years to 15.2% among those aged 50–59 years. Other sexual difficulties included lack of interest in sex or not finding sexual intercourse pleasurable, premature or non-orgasm, and lack of confidence in sexual performance or bodily attractiveness.

Sexually transmissible infections

Some sexually transmissible infections (STIs) are notifiable through the National Notifiable Diseases Surveillance System (NNDSS). These include HIV and AIDS, hepatitis B and C, chlamydial infection, donovanosis, gonococcal infection and syphilis. Several diseases, commonly or usually spread by sexual contact, as well as parasitic infestations such as pubic lice, are not subject to national notification and until recently no information on their prevalence was available.

The two most common STIs in Australia are believed to be human papillomavirus and genital herpes, both chronic viral infections. However, they are not notifiable and their prevalence is unknown.

According to the NNDSS, notifications of chlamydia infections increased from 24,039 in 2002 to 36,225 in 2004. Over one-third of infections occurred among those aged 20–24 years. Gonorrhoea, the next most common STI, was reported in 7,193 cases. Antibiotic-resistant strains of gonorrhoea present an increasing problem in the Asia–Pacific region. In Australia, the Australian Gonococcal Surveillance Programme found that the percentage of isolates resistant to penicillin had increased from 19.5% in 2000 to 22% in 2004, and resistance to other antibiotics was also increasing (AGSP 2005).

The bloodborne infections of HIV and hepatitis (B and C) may also be transmitted sexually as well as by other means. More than 85% of newly acquired HIV cases in 1999–2003 involved sex between males. New cases of HIV infection in 2003 totalled 277 (NCHECR 2005). There were 5,853 cases of hepatitis B and 12,938 of hepatitis C (NNDSS 2005). Further information from the NNDSS on STIs, and status reports on HIV/AIDS and hepatitis B and C, are presented in Section 2.8 of this chapter.

According to the Australian Study of Health and Relationships, 20.2% of males and 16.9% of females reported that they had been diagnosed with an STI or bloodborne infection at some stage of their life (Grulich et al. 2003a). The reported diagnoses of infections in the 12 months before the survey were 2.0% and 2.2%, in males and females respectively (Table 2.13). GP practices, rather than sexual health clinics, were the most common location of treatment.

Among those heterosexually active, 42.5% of males and 34.2% of females had used condoms within the year before the survey (de Visser et al. 2003). However, only 44.6% of men and 35.4% of women had always used condoms for vaginal intercourse in the past six months with casual partners. Heterosexual couples who used other forms of contraception were significantly less likely to use condoms as well. Condom use was higher among younger persons and among those with more than one sexual partner. The proportion of homosexual males using a condom was 58.9%. They reported being considerably more likely, at 86.8%, to always use condoms for anal sex with a casual partner.

Table 2.13: Self-reports of being diagnosed with an STI or bloodborne virus, 2001–02

	Ever (%)		Last 12 months (%)	
Infection or virus	Males	Females	Males	Females
Diagnosed with an STI	20.2	16.9	2.0	2.2
Pubic lice	9.8	4.2	0.3	0.1
Genital warts	4.0	4.4	0.5	0.3
Wart virus (on Pap smear)	. .	5.1	. .	0.8
Chlamydia	1.7	3.1	0.2	0.2
Genital herpes	2.1	2.5	0.8	1.1
Syphilis	0.6	0.1	< 0.1	0.0
Gonorrhoea	2.2	0.6	<0.1	<0.1
Non-specific urethritis	5.0	. .	0.3	. .
Pelvic inflammatory disease	. .	2.3	. .	0.2
Bacterial vaginosis	. .	1.8	. .	0.6
Trichomoniasis	. .	0.8	. .	<0.1
Candida or thrush[(a)]	6.6	57.6	1.3	17.5
Hepatitis A	1.9	1.6	<0.1	<0.1
Hepatitis B	0.7	0.5	0.0	<0.1
Hepatitis C	0.5	0.5	0.0	<0.1

(a) Not included when calculating lifetime or 12-month incidence of STIs.

. . Not applicable.

Source: Grulich et al. 2003b.

Oral health

Oral health is an integral component of lifelong health and is much more than the absence of oral diseases. Oral health includes a person's comfort in eating and social interactions, their self-esteem and their satisfaction with their appearance. Importantly, even among people who have no oral diseases or disorders, some have better oral health than others.

Perceptions of oral health and positive or negative effects of oral conditions on the quality of life must necessarily be measured by people's self-reports. In the case of children, perceptions and effects may also be reported by parents.

Oral health can also be assessed objectively through oral examinations by dental clinicians. A widely used clinical measure is the index of decayed, missing or filled teeth, which represents the cumulative experience of treated and untreated dental decay.

Oral health of adults

Three different measures (or 'dimensions') help provide a picture of oral health among adults:

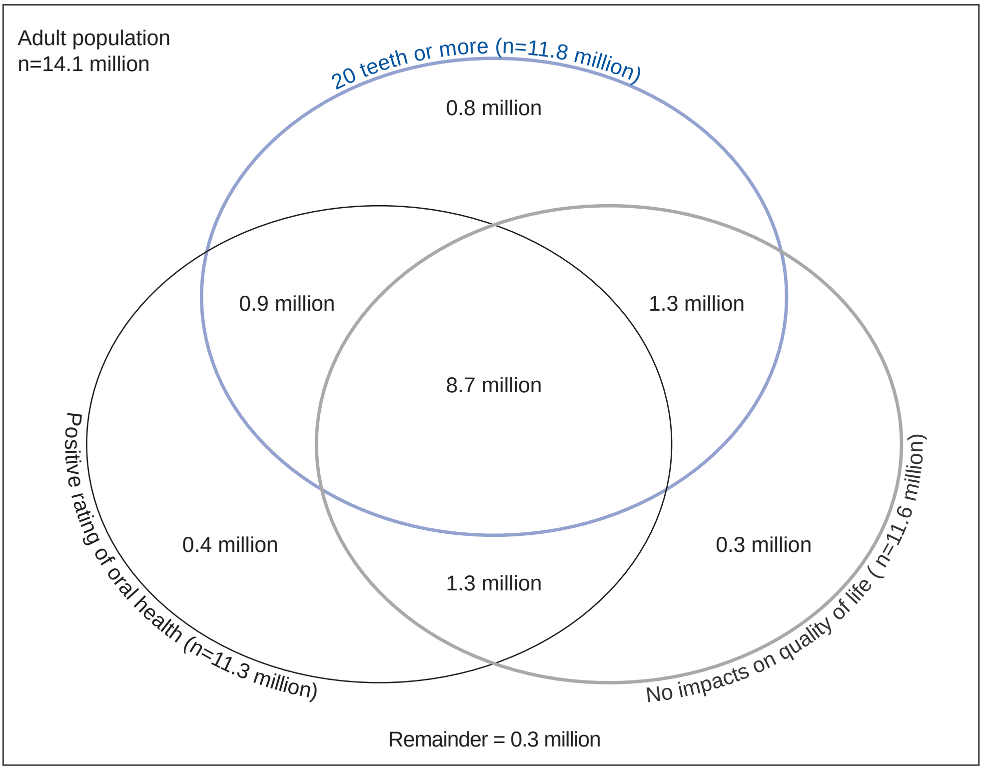
- The number of remaining natural teeth: good oral health may be described as having 20 or more teeth.
- Self-rated oral health: the response scale ranges from 'excellent' to 'poor'.
- Impaired quality of life due to oral conditions: this covers discomfort while eating, being self-conscious about teeth, and finding life less satisfying because of dental problems.

The 2002 National Dental Telephone Interview Survey, and a subsequent self-completed questionnaire that was mailed to interviewees, provide information about the oral health of Australians along these three dimensions. According to the survey, at least 84% of people had at least 20 teeth, 80% rated their oral health as 'good, very good, or excellent', and 83% experienced no adverse effects of oral conditions on quality of life.

However, there was considerable discrepancy among these perceptions in that only 62% of those interviewed reported relatively good oral health in all three dimensions. They are represented by the estimated 8.7 million people in Figure 2.8 who overlap on all three aspects. Examples of discrepancy included an estimated 1.3 million adults who would have had at least 20 teeth and no impact on the quality of life, but rated their oral health only as average, poor or very poor. A further 900,000 would have had at least 20 teeth and rated their oral health as good, very good or excellent, yet experienced one or more adverse effects on their quality of life.

Oral health of children

Good oral health can have positive benefits for both children and their parents. It enhances children's confidence and self-esteem in ways that are valued by both them and their parents.



Note: This figure is indicative only, and sectors are not to scale.
Source: 2002 National Dental Telephone Interview Survey.

Figure 2.8: Dimensions of oral health among Australian adults, 2002

Conversely, oral diseases and disorders during childhood can negatively affect the life of children and their parents. Dental decay can cause toothache, which can be painful and distressing for children and worrying for parents. Dental caries is the single most common chronic disease among children.

Early prevention is the single most effective mechanism to reduce the effects of oral diseases and conditions. Parental counselling about diet, oral hygiene practices, appropriate uses of fluorides and avoidance of transmission of bacteria from parents to children—all establish practices and behaviours for good oral health.

Water fluoridation and oral health of children

Studies conducted by the AIHW's Dental Statistics and Research Unit since 1990 have demonstrated that there are fewer teeth with decay among Australian children who drink water containing about 1 mg/L fluoride ions compared with children who drink water containing no fluoride. These and other studies have also shown that other sources of fluorides, including toothpaste and professionally applied fluoride products, provide further benefits.

Although it helps protect against dental decay, fluoride consumed excessively in early childhood can cause dental fluorosis. This is a developmental disorder of dental enamel, the visible, outer layer of the teeth that creates its hard surface. In its mildest forms, dental fluorosis causes whitening of the enamel surface that is visible only when the tooth is dried. In its most severe forms, dental fluorosis creates a chalky white or brown appearance, and may cause pitting of the enamel surface.

Because dental fluorosis is caused by excessive consumption of fluoride, its severity in populations typically increases with increasing concentration of fluoride in drinking water, and when fluoride from other sources is ingested in early childhood. Examples of the latter include inappropriate consumption of fluoride supplements by children who additionally drink fluoridated water, and inadvertent ingestion of toothpaste containing fluoride.

The potential trade-off between fewer caries and the degree of fluorosis was studied by the AIHW's Dental Statistics and Research Unit in 2002–03. The study asked 677 South Australian children aged 8–13 years and their parents to rate the children's teeth on a scale ranging from 'poor' to 'excellent'. There was also a clinical assessment of caries and dental fluorosis. In addition, the children and their parents were asked various questions directed at their functional, emotional and social 'quality of life' in relation to their oral health, with the answers then compared with the degree of decay and fluorosis.

The study found that fluorosis in its mild and moderate forms was associated with a net benefit in how parents perceived the condition of the children's teeth and in the children's emotional and social dimensions of oral health. Based on these findings, it is evident that the population perceives being free of dental decay as the preferred oral health status, even when it is associated with mild or moderate levels of dental fluorosis. Fluoride programs in Australia seek to strike this balance by improving the oral health of children with a low level of perceived side-effects.

2.3 Morbidity and illness

This section and the rest of this chapter focus on aspects of ill health rather than on health in more general terms.

Information on the levels of ill health, or morbidity, in Australia is limited in scope and quality. There is no single source that can be used to describe the effects of ill health across the spectrum of disease severity. Administrative data sources such as hospital separations and visits to GP can be used to assess those aspects of disease that require medical attention. However, information on a variety of common self-limiting symptoms and minor complaints such as headaches, rashes and troubles with teeth does not easily become available through these sources.

A major source of this type of information in Australia is various health surveys, conducted by the Australian Government (National Health Survey; Survey of Mental Health and Wellbeing; Survey of Disability, Ageing and Carers; and many others), as well as the computer-assisted telephone interviews undertaken by several states and territories. Most of the information generated through these surveys is based on self-reports (see, for example, Box 2.2). The information can be complemented from other sources such as disease registers.

The profile of morbidity in Australia generated from the NHS, which is private household-based, is quite different from that obtained from the mortality or hospital separations data (see Section 2.5). This is to be expected as self-reports tend to include non-fatal, chronic conditions. Quite often, self-reports also represent the less severe end of the spectrum of the disease, even if the reported diseases and conditions are chronic. This information, therefore, must be used in conjunction with morbidity information gleaned from other data sources.

Box 2.2: The National Health Survey and self-assessed health information

The ABS conducts the NHS regularly to collect information about the health of Australians. The last three surveys were conducted in 1995, 2001 and 2004–05. The 2004-05 NHS was conducted from August 2004 to June 2005. The survey was designed to obtain national benchmarks and provide further trend data on a wide range of health issues that include health status, the use of health services in relation to health, and related aspects of lifestyle and other health risk factors. Personal interviews were conducted with all respondents with the exception of children (aged 15 years and under), for which an adult resident, nominated by the household, was interviewed on that child's behalf.

The 2004–05 NHS collected information on a range of diseases, illnesses, conditions and disorders that the respondent reported had lasted or, were expected to last, for six months or more. These are collectively referred to as 'long-term conditions'.

The NHS estimates may not be true measures of prevalence, because they are based on self-reports, rather than physical examination and medical tests. It may be that some diseases are over-reported because the respondent confused the name of the disease, or a doctor at some time had only raised the possibility of the disease now reported by the respondent, but had not made a diagnosis. Also, heightened community awareness of some conditions may inflate reports. Conversely, under-reporting of some conditions may occur. Many diseases produce few or no symptoms, at least in their early stages, and therefore may not be known to the respondent to report. Similarly, diseases which may be of a sensitive nature (for example, AIDS) may also not be reported by the respondent.

Information from the National Health Survey

Two major aspects of morbidity can be illustrated using the NHS data. The NHS collects information on actions taken for health in the two weeks before interview. The action could be for acute events (such as injury, fever or other medical problems) or for existing chronic conditions. The NHS also collects information on the prevalence of long-term conditions, which by NHS definition are conditions that have lasted for six months or are likely to do so (see Box 2.2). In this report, long-term conditions are treated as chronic conditions.

The actions that have been taken recently by people (or on their behalf) for their health include hospitalisation (as inpatients, emergency/casualty attendance, outpatient consultations and at day clinics), consulting with GPs and specialists, seeking dental care and receiving support from other health professionals. Some of the visits to different professionals, or to the same professional, may be for the same ailment or problem. On the other hand, a person may visit the health professional, particularly the GP, for more than one problem.

Medical care

Information is collected about actions taken in the two-week period before the NHS interview. The information may be projected to annual rates for broad comparisons.

Hospital admissions

From the 2004–05 NHS, more than 151,000 persons are estimated to have been discharged from hospitals in Australia in the two weeks before the NHS interview. That translates to almost 4 million separations each year. The NHS estimate is well short of the number of hospital separations in Australia—more than 6 million separations occurred in 2003–04, as obtained in the AIHW National Hospital Morbidity Database (AIHW 2005a). It is instructive to note that the NHS is a private household-based survey and does not include those living in various institutions. Also, the AIHW National Hospital Morbidity Database is event- rather than person-based, which may lead to overestimates.

Visits to emergency departments, outpatient clinics and day clinics

The number of hospital admissions is only the tip of the morbidity pyramid. According to the 2004–05 NHS, there are many non-admitted hospital episodes—an estimated 178,000 visits to emergency departments, 364,000 outpatient visits, and 488,000 attendances at day clinics within a two-week period. On an annual basis, these estimates exceed 4.6 million, 9.4 million and 12.1 million, respectively. However, it should be noted that some of these presentations, in particular attendance at day clinics, may be for health maintenance and disease prevention, and not for reducing morbidity or illness directly.

Visits to GPs and specialists

An estimated 4.5 million visits are made to GPs and specialists in Australia every two weeks (ABS 2006b). This amounts to an estimated 117 million visits in 2004–05. While a large number of these visits are not for new episodes, the extent of prevalent morbidity in Australia at a particular point of time is well demonstrated by this high number. Almost one-fifth of these visits were made to specialists.

Females are more likely to consult health professionals than males, although this does not necessarily suggest a large difference in disease prevalence. Consultations with health professionals increase greatly with age.

Long-term conditions

In 2004–05, an estimated 77% of Australians had a long-term condition. The proportion increased with age, from 41% of those aged under 15 years to over 95% of persons aged 45 years or over.

Table 2.14 shows that the most common long-term conditions, as reported by Australians in 2004–05, are non-fatal chronic conditions such as sensory impairments and diseases, back pain and disc problems, hay fever and allergic rhinitis, and arthritis.

Both sexes report much the same set of diseases and conditions. The lists of leading long-term conditions for both males and females are broadly similar, with high agreement in the ranking. However, migraine was a condition that females commonly experienced that was not in the top 10 conditions for males. Similarly, high cholesterol was in the top 10 conditions for males but ranked 12th most common for females.

What distinguishes the two sexes in terms of reported long-term conditions is the rates, and not ranks, of various conditions. Of the top 10 conditions, females report more of all conditions except deafness, high cholesterol, and back pain and disk problems.

Table 2.14: 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 and disc problems[(a)]	16.0	3	14.7	4
Hayfever and 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 2006b.

Age-specific distribution

The types of long-term conditions that people reported varied with age (Table 2.15). For example, respiratory conditions such as asthma and hayfever (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 or over. Long- and short-sightedness were common in most age groups. It is of interest that long-term conditions that dominate in certain age groups (for example, arthritis in older groups) are not the conditions that are common causes of death in those age groups.

Comorbidity

A large proportion of the population reports the occurrence of more than one long-term condition, and the mix of conditions varies. There are also different reasons for various groupings of conditions.

Table 2.15: 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
	Hayfever & 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		Hayfever & allergic rhinitis	19.3
15–24	Hayfever & 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
	Hayfever & 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 or over	Long-sightedness	59.3
	Back pain & disc problems[(b)]	21.6		Arthritis (all types)	49.9
	Hayfever & 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 2006b.

It may be that some long-term conditions share common causal mechanisms and risk factors. For example, 20% of persons with diabetes also reported the presence of one or more types of 'heart, stroke or vascular diseases' (HSVD), as categorised by the ABS. Conversely, 19% of persons with HSVD also reported having diabetes. The connection between diabetes and HSVD is well recognised.

Other comorbidity may be age-related. For example, 52% of those reporting HSVD also reported the coexistence of arthritis (Table 2.16). On the other hand, only 13% of persons with arthritis reported having HSVD. No clear association other than age as the common factor is noted between arthritis and HSVD.

Causes

More than one out of five respondents to the 2004–05 NHS reported the cause of their long-term condition as work-related (ABS 2006b). The proportion was the highest, almost 40%, among those reporting back pain and disc disorders (Table 2.17). Several other musculoskeletal conditions were also considered by respondents to be work-related.

Table 2.16: Comorbidity for selected long-term conditions[a], 2004–05

Condition	Arthritis	Asthma	Diabetes	HSVD[b]	Mental problems[c]	Estimated number of persons with the condition
	Per cent (row-wise)					Number ('000)
Arthritis	100.0	13.3	9.4	13.0	13.3	3,020
Asthma	20.0	100.0	4.3	4.7	13.6	2,014
Diabetes	40.8	12.4	100.0	20.4	9.0	700
HSVD[b]	52.0	12.5	18.9	100.0	14.3	755
Mental problems[c]	23.4	16.0	3.7	6.3	100.0	1,719

(a) As a proportion of those reporting the selected condition.

(b) Heart, stroke and vascular diseases (includes ischaemic heart disease, cerebrovascular disease, oedema and heart failure, and diseases of the arteries, arterioles and capillaries), as operationalised in ABS 2006b.

(c) Mental and behavioural problems (includes mood (affective) problems, anxiety-related problems, and behavioural and emotional problems with usual onset in childhood/adolescence).

Notes

1. Percentages are given across rows. For example, 13.3% of people who reported arthritis also reported asthma, and 20.0% of those who reported asthma also reported arthritis.
2. Rows and columns do not add up to 100%.

Source: ABS 2006b.

About 16% of respondents attributed their long-term condition to injury. The proportion exceeded 31% among those reporting back pain and disc disorders. Again, several musculoskeletal conditions were considered by respondents to be injury-related.

Table 2.17: Causes of selected long-term conditions, persons aged 15 years or over, 2004–05

	Reported cause (per cent)		
Condition	Work-related[a]	Resulted from injury	Estimated number of persons with long-term condition ('000)
Back pain and disc disorders	39.0	31.2	2,998
Deafness (complete or partial)	27.4	3.8	1,960
Rheumatism and soft tissue disorders	20.6	15.9	580
Anxiety-related problems	19.4	3.9	878
Mood (affective) problems	15.6	3.3	1,022
Other musculoskeletal system and connective tissue disorders	13.0	14.4	1,632

(a) Conditions reported as work-related that may include work injuries.

Source: ABS 2006b.

Trends in prevalence

The ABS has conducted three National Health Surveys in the 1995–2004 decade. While the methods have varied, reasonable insight into trends in self-reported long-term conditions in Australia can be obtained from these surveys (Table 2.18).

The prevalence of long-sightedness is increasing in Australia. Upward trends are also noted for hay fever and allergic rhinitis, mental and behavioural problems, and diabetes.

Table 2.18: Trends in the prevalence of commonly reported long-term conditions, 1995, 2001 and 2004–05 National Health Surveys (per cent)

Condition	1995	2001	2004–05
Long-sightedness	22.0	22.4	26.3
Short-sightedness	20.9	20.9	21.8
Hayfever and allergic rhinitis	13.9	15.5	16.1
Back pain and disc problems[(a)]	6.4	20.5	15.1
Arthritis	15.7	13.9	14.9
Mental and behavioural problems	5.9	9.6	10.7
Hypertensive disease	11.5	10.3	10.4
Asthma	11.1	11.6	10.2
Deafness (complete or partial)	10.1	10.8	10.1
Diabetes	2.4	3.0	3.5

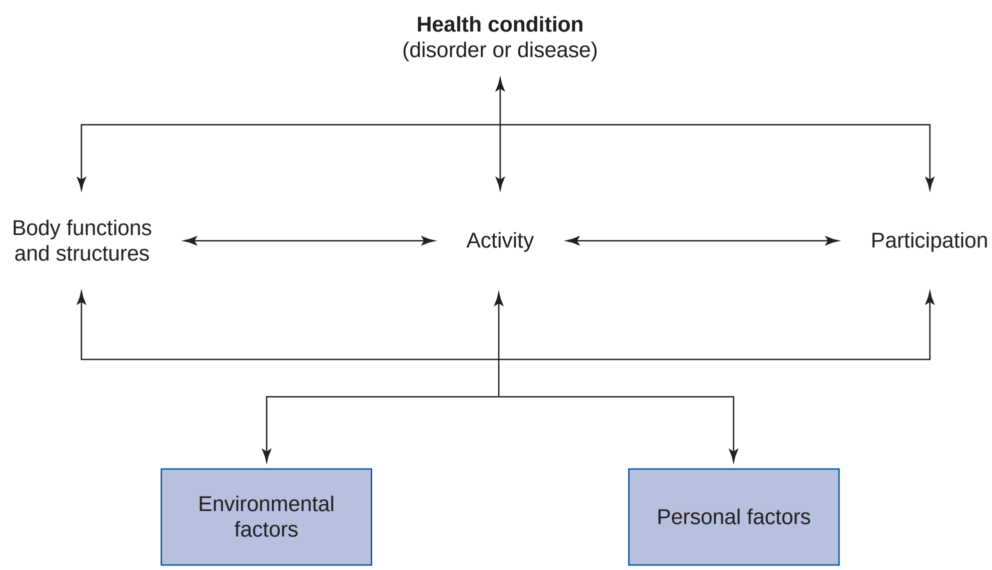
(a) Includes back problems not elsewhere classified.

Note: Percentages were age-standardised to the Australian population as at 30 June 2001.

Source: ABS 2006b.

2.4 Disability

It is estimated that some form of disability affects one in five Australians. Disability may be experienced in terms of impairments of body functions and structures, activity limitations or participation restrictions, and it is crucially influenced by the person's environment (Figure 2.9).



Source: WHO 2001a.

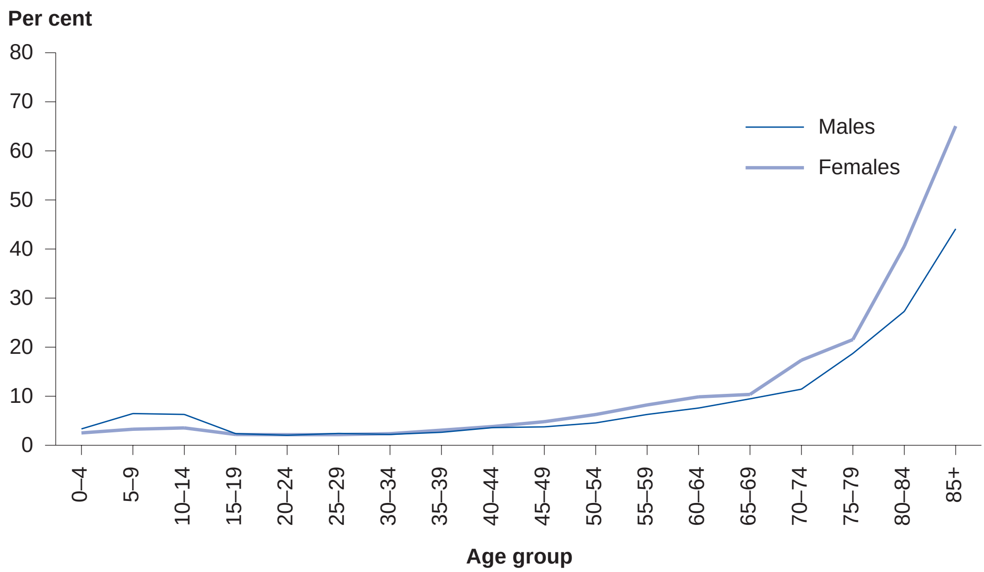
Figure 2.9: Interactions between components of the International Classification of Functioning, Disability and Health

For instance, a person with long-term arthritis may have impaired mobility of joints and bones; limitations in activities such as walking, moving and handling objects; and restrictions in participation in domestic life and recreation. Environmental factors—such as equipment, mobility aids and personal assistance—may all have a crucial effect on the person's overall level of disability.

A chief source of data on disability in the Australian population is the ABS Survey of Disability, Ageing and Carers (ABS 2004b), which captures a broad scope of disabilities. A key indicator of 'severe disability' is the presence of what the survey terms 'severe or profound core activity limitations'; that is, the need for assistance with self-care, mobility or communication. Such limitations were experienced by 6.3% of the population, about one in 16 people, in 2003. A further 14% were found to have a lesser degree of disability, totalling some 20% of the population.

Disability prevalence and ageing

Disability varies strongly with age (Figure 2.10). The peak in prevalence of severe or profound core activity limitations in early childhood and school years may reflect the environment of family, early intervention services and school, which together may identify a greater proportion of disabilities than at later ages. The prevalence rate in 2003 was lower among adolescents than children, and remained at a rate just under 2.5% among people in their 20s and early 30s.



Source: AIHW analysis of ABS 2003 Survey of Disability, Ageing and Carers confidentialised unit record file.

Figure 2.10: Age-specific prevalence of severe or profound core activity limitations, 2003

The prevalence rates begin to climb again for age groups 25 years or over, as new risk factors for disability affect the population. For young adults, particularly males, injury is a relatively high risk. In the middle years people may experience work-related injuries or the onset of musculoskeletal and other conditions such as arthritis and cardiovascular diseases, as well as hearing and psychiatric disabilities.

Disability is not an inevitable part of the experience of ageing. It does, however, become more common at older ages: more illnesses affecting human functioning become prevalent, and the rates of vision, hearing and movement-related disabilities are higher. In the 2003 Survey of Disability, Ageing and Carers, almost one-quarter (23%) of older people reported a severe or profound core activity limitation. Rates were higher for females than for males at all ages over 65 years.

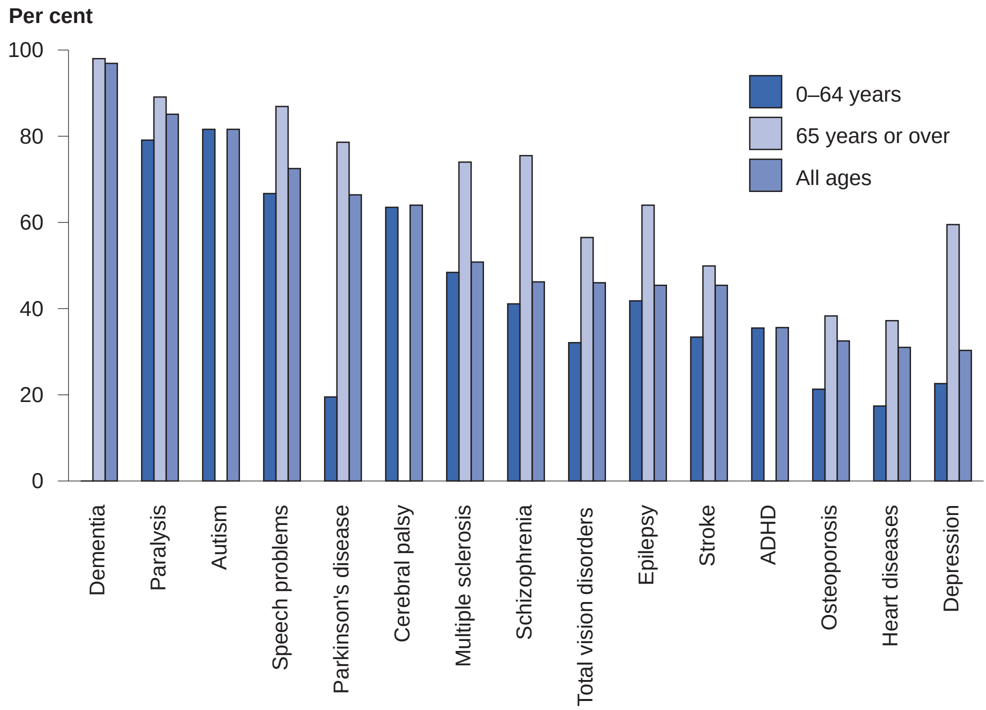
Up to age 69 years, 10% or less of those surveyed reported a severe or profound core activity limitation. As Figure 2.10 illustrates, the prevalence rates started to increase more sharply for people in their 70s (one-fifth of people aged 75–79 years), and rose steeply for those aged 80 years or over; of those aged 85 years or over, 58% had severe disability, with females reporting much higher rates than males (65% compared with 44%). Rates were higher for females than for males at all ages over 65 years. It is important to note that, even at these older ages, about 42% had less severe or no core activity limitations.

Disability and related health conditions

The relationship between health conditions and disability can be viewed in several different ways (AIHW 2005b). One way is by examining health conditions most likely to be associated with profound or severe core activity limitations. Of those health conditions recorded in the ABS Survey of Disability, Ageing and Carers, the 15 most likely to be associated with profound or severe core activity limitations are shown in Figure 2.11. Of people aged under 65 years with autism in 2003, 82% reported such limitations, as did 79% of those with paralysis, 67% of those with speech-related conditions and 64% of those with cerebral palsy. The health condition most likely to be associated with a profound or severe core activity limitation among older people is dementia —98% of those aged 65 years or over had such a limitation. It was followed by paralysis (89%), speech-related conditions (87%), Parkinson's disease (79%) and schizophrenia (76%). Most of these conditions are highly age-related.

Another way of looking at the relationship between disability and health conditions is to ask which are the most common conditions associated with profound or severe core activity limitations in the population. This presents a different picture, related to the prevalence of the health conditions themselves.

The leading conditions associated with profound or severe core activity limitations among people aged under 65 years in 2003 were back problems and arthritis—1.2% of people of this age with a profound or severe core activity limitation reported back problems, and 0.9% reported arthritis (Figure 2.12). For the population as a whole, arthritis, hearing disorders and back problems led the list. Conditions such as attention deficit hyperactivity disorder, autism and dementia, while highly likely to be related to profound or severe core activity limitations (Figure 2.11), were less commonly reported by people because these conditions are generally less prevalent.



Source: AIHW analysis of ABS 2003 Survey of Disability, Ageing and Carers confidentialised unit record file.

Figure 2.11: Proportion who have profound or severe core activity limitation among people with specific health conditions, by age, 2003

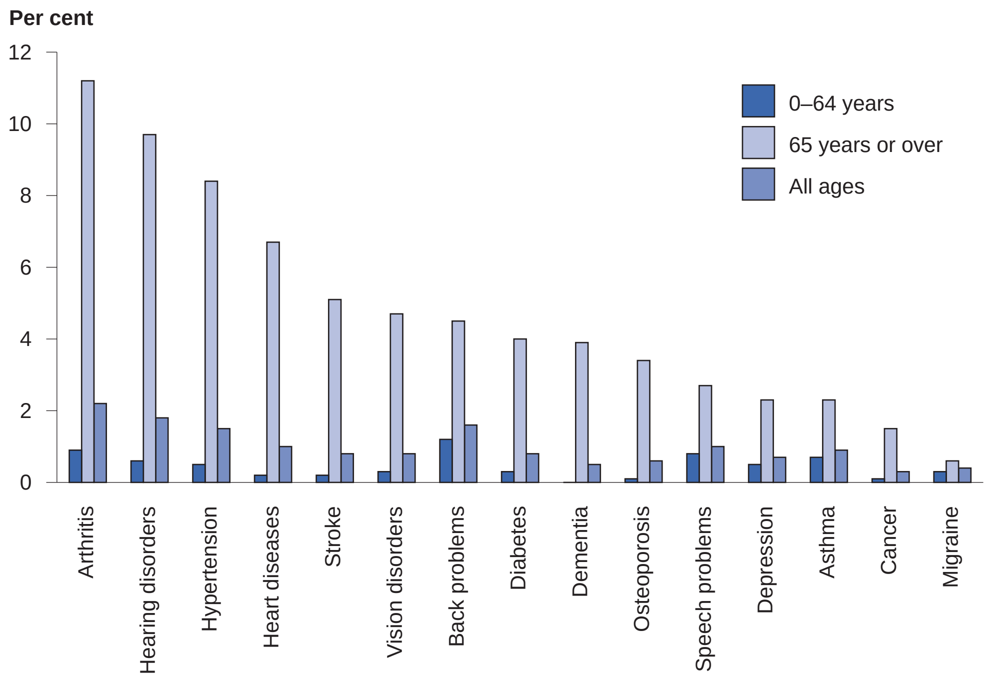
It is not suggested that these conditions and diseases explain or 'account for' most disability in the population. The International Classification of Functioning, Disability and Health model does not suggest direct causal relationships, but rather acknowledges that a health condition is one of several important factors in the creation of disability (see Figure 2.9).

Disability trends, 1981–2003

As the population grows and ages, and as life expectancy increases, there will be more people in Australia at older ages and therefore more people with disabilities. However, there is no evidence that the rates of severe disability are rising for any particular age group (ABS 2004b; AIHW 2000, 2003a). The evidence from the five population disability surveys since 1981 is that:

- the reported age-standardised rates of 'severe disability' in Australia were fairly stable between 1981 and 1993
- there was an increase in rates from 1993 to 1998, mainly attributed to changes in the survey methods, questions and administration
- the 2003 rates were consistent with those of 1998, confirming the earlier pattern of stability. The 2003 survey retained the 1998 survey questions and methods, resulting

in the age-standardised rates for severe or profound core activity limitations of 6.4% in 1998 and 6.3% in 2003.



Source: AIHW analysis of ABS 2003 Survey of Disability, Ageing and Carers confidentialised unit record file.

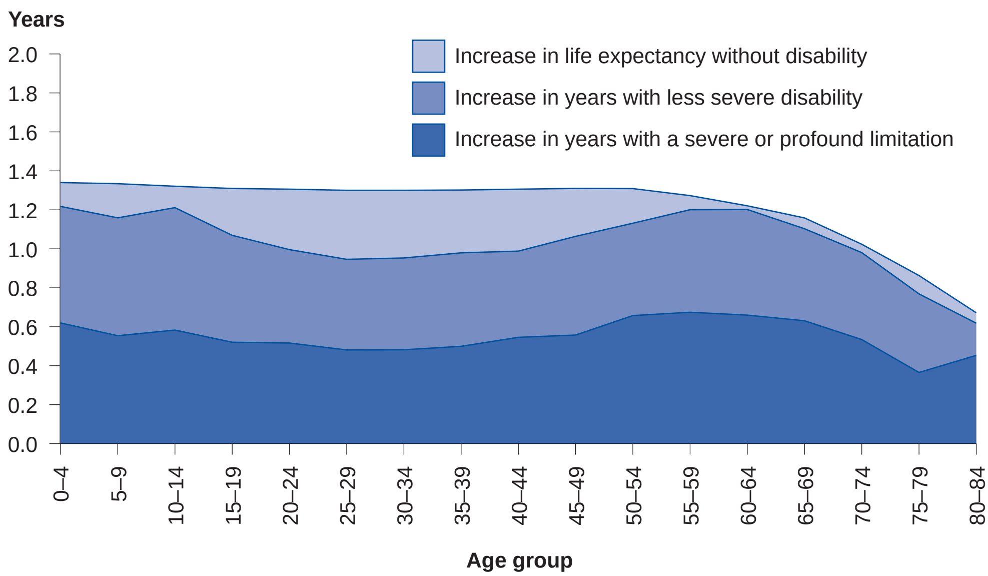
Figure 2.12: Prevalence rate of health conditions (based on all conditions) among people with a profound or severe core activity limitation, by age, 2003

It is concluded that overall there was no change in rates of severe disability between 1981 and 2003. The rise in reported rates in 1998 is attributable to changes in survey methodology rather than population changes.

Disability and life expectancy

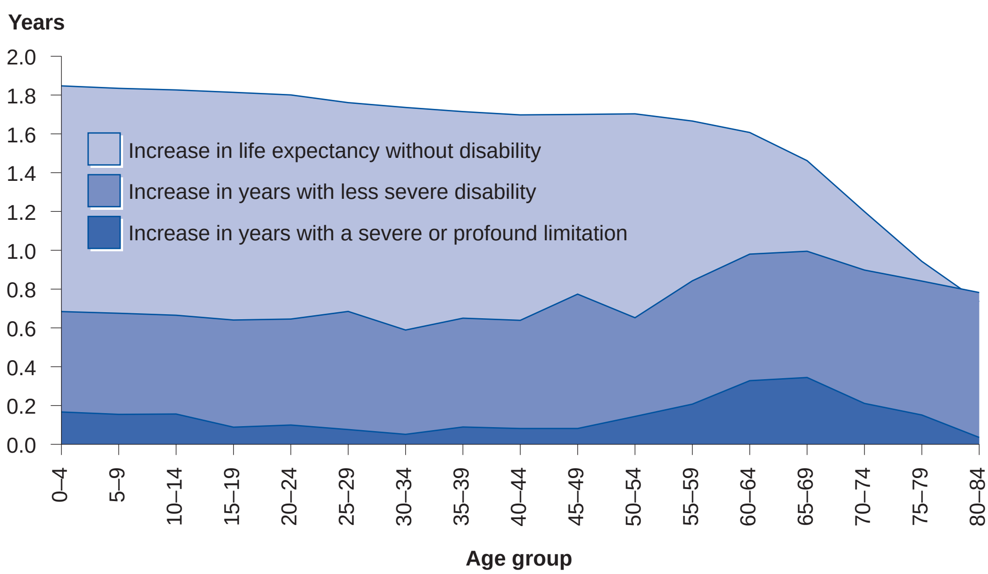
A question of interest in Australia and internationally is whether the years of life lived with disability are increasing along with the gains in life expectancy. In Australia, between 1988–1993 and 1998–2003, gains in life expectancy were accompanied by increases in expected years both with and without disability (AIHW 2006a).

Between 1998 and 2003, life expectancy at birth increased by 1.3 years for females and 1.8 years for males. A large proportion of the gain in female life expectancy at birth was extra years with disability (1.2 of the 1.3 years gained), compared to the proportion for males (0.7 of the 1.8 years). These differences applied across all age groups, and were particularly evident among the older population at age 65 years or over and children aged under 15 years (figures 2.13 and 2.14).



Source: AIHW 2006a.

Figure 2.13: Changes in life expectancy and associated disability, females, 1998 to 2003



Source: AIHW 2006a.

Figure 2.14: Changes in life expectancy and associated disability, males, 1998 to 2003

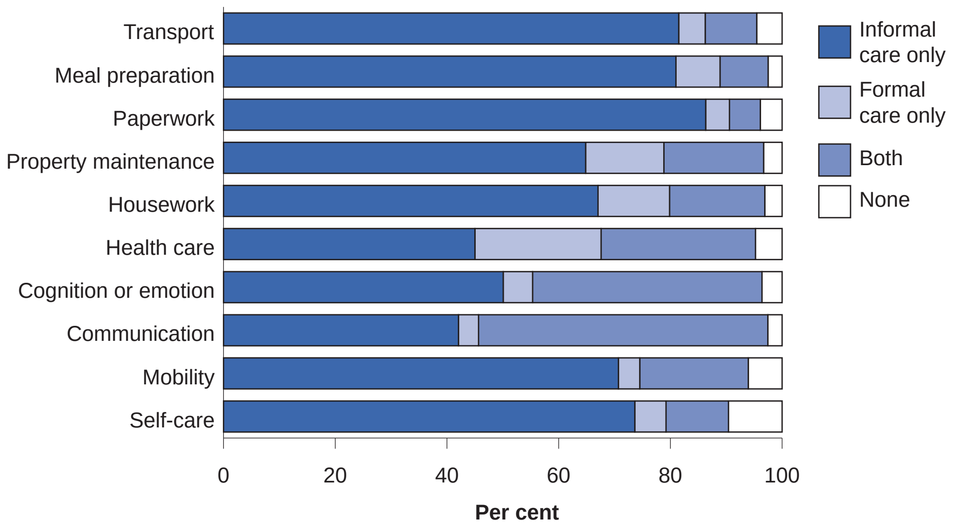
Over this period, the expected years with severe or profound core activity limitations remained approximately the same for males at birth, but increased by 0.7 years (9.2%) for females.

The expected years with disability at age 65 years increased by 1.2 years for females and 1.0 year for males, while small increases in the expected years with a severe or profound core activity limitation were evident for females (0.6 years) and males (0.3 years).

Activity limitations

Activity limitations represent one dimension of disability, but one which is considered important in planning service provision, as well as being a dimension on which population data are of good quality. (By contrast, information on participation restrictions and environmental factors is not as adequate in Australia; see, for instance, AIHW 2005b:256.)

Informal care networks of family, friends and neighbours provided much of the help received by people with severe or profound core activity limitations living in the community; 65% relied entirely on informal assistance with core activities (self-care, mobility and communication) and 39% did so for other activities (Figure 2.15). A combination of both formal and informal care was provided to 24% of people needing help with core activities, and to 55% of those also needing help with other activities. Much smaller percentages of people were entirely reliant on formal care—4% of those needing assistance with core activities and 5% of those also needing assistance with other activities. People needing assistance with communication (52%) and cognition and emotion (41%) were the most likely to be receiving a mix of formal and informal assistance.



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

Source: AIHW analysis of ABS 2003 Survey of Disability, Ageing and Carers confidentialised unit record file.

Figure 2.15: Type of care received in performing various activities, 2003

2.5 Causes of death

The 'cause of death' information, gained from death certificates, provides insights into the events that either directly lead to or contribute to death.

Cause of death statistics usually refer to the 'underlying cause', which is the disease or injury that initiated the train of events leading directly to death. In addition, 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 supplied on death certificates, using an automated process.

The mortality information provided below has been organised to reflect the underlying cause of death in two ways. First, 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. Information on cancer deaths, for example, has been provided by individual cancer type rather than for cancer overall. Similarly, information on the ICD chapter of circulatory (cardiovascular) diseases has been categorised to the level of more specific diseases or conditions, such as ischaemic heart disease. Second, the statistics for various age groups are provided at the ICD chapter level, due to the smaller numbers involved.

Leading causes of death

The top 20 specific causes of death given in Table 2.19 were responsible for nearly 74% of all deaths in 2004. Ischaemic heart disease (also known as coronary heart disease: heart attack and related disorders) and cerebrovascular disease (notably stroke) were the two leading specific causes of deaths in that order, and in both sexes, accounting for more than a quarter of all deaths that year.

Lung cancer was the third leading underlying cause of male deaths, followed by 'other heart diseases', a category which includes heart failure. In contrast, 'other heart diseases' was the third leading cause of death among females, followed by dementia and related disorders.

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

Although the rankings of various underlying causes of death have not changed significantly since the last edition of *Australia's health* (AIHW 2004b), the overall contribution of 20 leading causes of death dropped by over 1 percentage point from 75% of deaths in 2002 to 74% of deaths in 2004. Most of this decline was due to the reduced number of deaths from ischaemic heart disease. The number of deaths due to unknown primary cancer sites, on the other hand, increased considerably between 2002 and 2004. Deaths from various disorders of the urinary system, mostly due to urinary tract infections, also entered the top 20 leading causes of death in females for the first time.

Table 2.19: Leading causes of death, all ages, 2004

	Males			Females		
Rank	Cause of death	Number of deaths	Per cent of all deaths	Cause of death	Number of deaths	Per cent of all deaths
1	Ischaemic heart disease (I20–I25)	13,152	19.2	Ischaemic heart disease (I20–I25)	11,424	17.8
2	Cerebrovascular disease (I60–I69)	4,826	7.1	Cerebrovascular disease (I60–I69)	7,215	11.3
3	Lung cancer (C33–C34)	4,733	6.9	Other heart diseases (I05–I09, I11, I13, I26, I27, I30–I52)	4,272	6.7
4	Other heart diseases (I05–I09, I11, I13, I26, I27, I30–I52)	3,290	4.8	Dementia and related disorders (F01–F03, G30–G32)	3,253	5.1
5	Chronic obstructive pulmonary disease (J41–J44)	2,986	4.4	Breast cancer (C50)	2,641	4.1
6	Prostate cancer (C61)	2,761	4.0	Lung cancer (C33–C34)	2,531	3.9
7	Colorectal cancer (C18–C21)	2,215	3.2	Chronic obstructive pulmonary disease (J41–J44)	2,213	3.5
8	Diabetes (E10–E14)	1,869	2.7	Colorectal cancer (C18–C21)	1,911	3.0
9	Unknown primary site cancers (C76–C80, C26, C39)	1,793	2.6	Pneumonia and influenza (J10–J18)	1,883	2.9
10	Suicide (X60–X84)	1,661	2.4	Unknown primary site cancers (C76–C80, C26, C39)	1,745	2.7
11	Pneumonia and influenza (J10–J18)	1,498	2.2	Diabetes (E10–E14)	1,730	2.7
12	Dementia and related disorders (F01–F03, G30–G32)	1,468	2.1	Diseases of the arteries, arterioles and capillaries (I7)	1,214	1.9
13	Diseases of the arteries, arterioles and capillaries (I7)	1,263	1.8	Kidney failure (N17–N19)	967	1.5
14	Land transport accidents (V00–V89)	1,160	1.7	Pancreatic cancer (C25)	963	1.5
15	Pancreatic cancer (C25)	1,015	1.5	Ovarian cancer (C56)	851	1.3
16	Liver diseases (K70–K77)	954	1.4	Lymphomas (C81–C85, C96)	739	1.2
17	Kidney failure (N17–N19)	928	1.4	Leukaemia (C91–C95)	606	0.9
18	Leukaemia (C91–C95)	842	1.2	Exposure to unspecified factor (X59)	558	0.9
19	Melanoma (C43)	821	1.2	Septicaemia (A40–A41)	525	0.8
20	Lymphomas (C81–C85, C96)	806	1.2	Other disorders of urinary system[(a)] (N39)	479	0.7
	Total (20 leading causes)	50,041	73.2	Total (20 leading causes)	47,720	74.4
	All deaths	68,395	100.0	All deaths	64,113	100.0

(a) All but one of these deaths are classified as N390, urinary tract infection, site not specified.

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 relative contribution of various underlying causes of death differs with age, as shown by the broad (ICD chapter level) causes listed in Table 2.20. Conditions emerging from the perinatal period dominate the infant mortality statistics, followed by congenital anomalies. Similarly, injuries and poisoning are the most common cause of death in the age groups 1–14 years and 15–24 years.

Table 2.20: Leading causes of death[(a)], by age group, 2004

	Males		Females	
Age group	Cause of death	Per cent of deaths[(b)]	Cause of death	Per cent of deaths[(b)]
Infants (under one year)	Conditions emerging from the perinatal period	46.9	Conditions emerging from the perinatal period	47.0
	Congenital anomalies	24.2	Congenital anomalies	24.3
	Ill-defined	12.8	Ill-defined	9.5
	Nervous system diseases	3.4	Injury and poisoning	3.8
1–14	Injury and poisoning	37.4	Injury and poisoning	33.2
	Cancer	18.2	Cancer	21.4
	Nervous system diseases	9.7	Nervous system diseases	12.7
	Congenital anomalies	7.9	Congenital anomalies	8.3
15–24	Injury and poisoning	74.7	Injury and poisoning	61.0
	Cancer	8.0	Cancer	11.5
	Ill-defined	4.4	Cardiovascular disease	5.1
	Nervous system diseases	3.8	Nervous system diseases	5.1
25–44	Injury and poisoning	51.4	Cancer	36.3
	Cancer	15.2	Injury and poisoning	28.0
	Cardiovascular disease	13.7	Cardiovascular disease	11.7
	Digestive disorders	3.5	Digestive disorders	4.5
45–64	Cancer	42.6	Cancer	56.9
	Cardiovascular disease	27.0	Cardiovascular disease	15.3
	Injury and poisoning	10.0	Injury and poisoning	6.2
	Digestive disorders	5.1	Respiratory system diseases	5.4
65–84	Cancer	36.6	Cardiovascular disease	35.1
	Cardiovascular disease	34.4	Cancer	32.4
	Respiratory system diseases	9.9	Respiratory system diseases	9.6
	Endocrine	4.2	Endocrine	4.6
85+	Cardiovascular disease	45.5	Cardiovascular disease	51.9
	Cancer	19.3	Cancer	12.2
	Respiratory system diseases	12.2	Respiratory system diseases	9.4
	Genitourinary diseases	3.5	Mental disorders	5.5

(a) Organised at ICD chapter level.

(b) Percentage of deaths within each age and sex group.

Source: AIHW National Mortality Database.

The changes with age in leading causes of death reflect both longer exposure to various environmental factors and the underlying ageing processes. Among those aged 25–44 years, injuries and poisoning remain the leading cause of death in males, as with the two younger age groups. However, in females aged 25–44 years, cancer takes over from injuries and poisoning as the leading cause of death. In both sexes, cancer is the most common cause of death among those aged 45–64 years, followed by cardiovascular disease, which includes both ischaemic heart disease and stroke.

Cancer and cardiovascular disease are again the two most common causes of death among those aged 65–84 years, but cardiovascular disease dominates the 85 years or over age group mortality. On the other hand, injury is no more one of the top four leading causes of death among those aged 65 years or over.

Respiratory diseases are significant contributors to death among those in advancing age. Prominent among these is COPD, a leading specific contributor to deaths overall. Respiratory diseases are responsible for about 10% of deaths among persons aged 65 years or over.

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 exact an emotional and often economic toll. Furthermore, much of this premature mortality may be avoidable.

Ischaemic heart disease is a major contributor to premature mortality among males, but breast cancer is the leading cause of PYLL among females (Table 2.21). Suicide, land transport accidents and lung cancer also feature highly for both sexes.

Males have 75% more PYLL than females. Two of the largest contributors to this gap are ischaemic heart disease and suicide.

Table 2.21: Leading causes of potential years of life lost (PYLL), 2004

	Males			Females		
Rank	Cause of death	PYLL	Per cent[(a)]	Cause of death	PYLL	Per cent[(a)]
1	Ischaemic heart disease (I20–I25)	61,458	11.4	Breast cancer (C50)	28,323	9.2
2	Suicide (X60–X84)	51,503	9.6	Lung cancer (C33–C34)	16,420	5.4
3	Land transport accidents (V00–V89)	41,875	7.8	Ischaemic heart disease (I20–I25)	15,545	5.1
4	Lung cancer (C33–C34)	28,223	5.2	Land transport accidents (V00–V89)	14,130	4.6
5	Other heart diseases (I05–I09, I11, I13, I26, I27, I30–I52)	17,423	3.2	Suicide (X60–X84)	13,520	4.4
	All causes	**539,105**	**100.0**		**307,858**	**100.0**

(a) Per cent of all-causes PYLL.

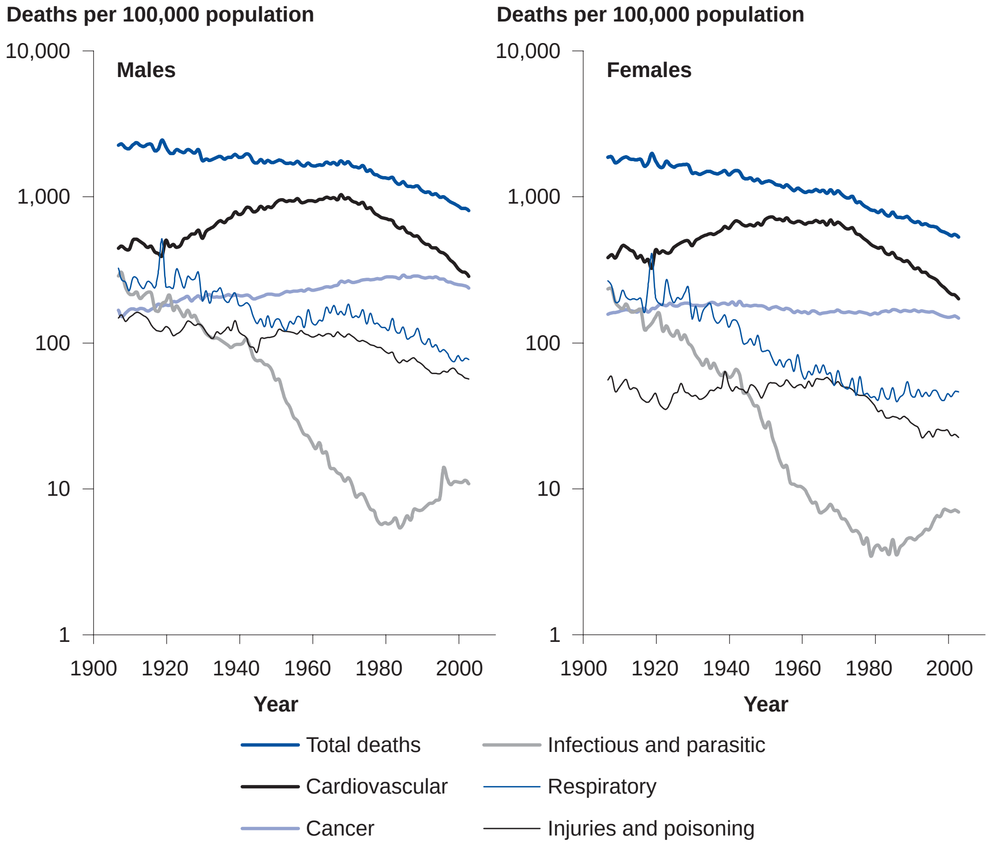
Notes

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

Source: AIHW National GRIM Books.

Trends in cause-specific 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. The male age-standardised rate fell by 66%, from 2,234 deaths per 100,000 in the early 1900s to 770 in 2004. The corresponding female death rate fell by 72%, from 1,844 to 511 (Figure 2.16).



Note: Age-standardised to the Australian population at 30 June 2001. Death rates are presented on a logarithmic scale.

Source: AIHW National GRIM Books.

Figure 2.16: Trends in death rates for all and broad causes of mortality, 1907 to 2004

These consistent overall trends, however, mask much variation in underlying trends in cause-specific death rates. The number of deaths occurring in different age groups from specific conditions has also changed considerably over time. Analysing these trends in more detail can provide a valuable guide to the evolution of a nation's health (Jemal et al. 2005).

Box 2.3: AIHW National GRIM Books

The AIHW has compiled a time series of cause-specific mortality data from early ABS paper records and more recent ABS electronic unit record data to form the General Record of Incidence of Mortality (GRIM) Books.

The GRIM Books are a collection of dynamic and interactive workbooks comprising cause-specific Australian mortality information for the most recent years (currently to 2004) and historically, for many causes, back to 1907. State and territory data are available from 1964 only. Individual workbooks have been created for over 150 causes (or combinations of causes) of death. However, data for all years and every cause may not always be available.

The mortality data are tabulated by cause of death, year of registration, age and sex. These data, together with population estimates, are used to calculate annual age-specific and age-standardised mortality rates, and other summary measures of mortality.

Trends in death rates for specific causes

The death rates for several causes did not follow the steadily declining slope noted for overall mortality, even though by the end of the 20th century the death rates for most of the major causes of death had fallen by varying degrees (Figure 2.16). The following long-term mortality trends for five broad disease groups, by ICD chapter, are noteworthy:

- Reduction in mortality from infectious and parasitic diseases was the single largest contributor to mortality reductions across the century. The death rate fell from 283 per 100,000 males in 1907 to 11 by 2004 (although there was a rise from the century's low point of 5 in 1984). Similarly, the corresponding rate for females fell from 229 to 7 per 100,000. It should be noted that 'infectious and parasitic diseases' excludes pneumonia and influenza, currently the largest contributors to communicable disease mortality.

- Respiratory diseases experienced the second largest reduction in mortality in Australia long-term. In males, the rate fell from 320 per 100,000 in 1907 to 71 in 2004, while in females the corresponding fall was from 263 to 44. These trends exclude the spikes in death rates from the 1918–19 Spanish influenza pandemic.

- Death rates for injury and poisoning recorded the third largest percentage reductions in mortality. The male death rate declined from 147 per 100,000 males in 1907 to 55 in 2004, and the rates for females fell from 55 to 23. These declines were interrupted briefly during the third quarter of the twentieth century by an increase in motor vehicle accident deaths.

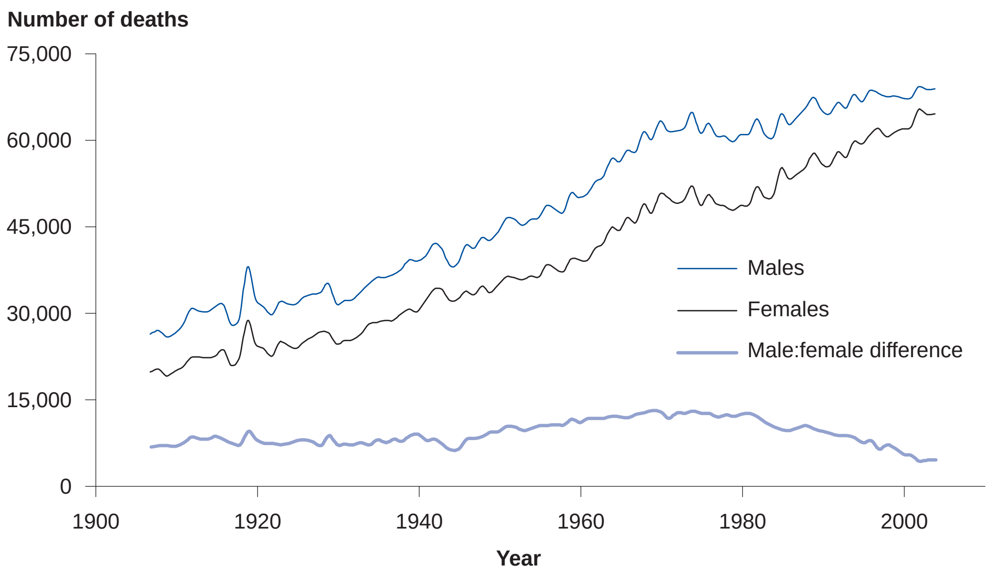
- Cardiovascular mortality has shown an interesting trend over the century: a large rise followed by an even larger fall. The rate for males increased from 437 per 100,000 in 1907 to 1,020 in 1968, then fell to 267 in 2004. In females, it increased from 379 per 100,000 in 1907 to 718 in 1952, before declining to 186.

- In contrast to trends for other major underlying causes, the death rate for cancer increased from 166 per 100,000 males in 1907 to 232 in 2004, with a peak of 287 in 1985. Among females, the death rate rose from 154 per 100,000 in 1907 to a peak of 190 in 1943, then fell to 143 in 2004.

Number of deaths

Despite the marked fall in age-specific death rates, with Australia's population growing larger and older the net effect is that the total number of deaths has been steadily increasing. Between 1907 and 2004, the number of deaths almost trebled from 45,305 to 132,508. The increase was higher for females (from 19,366 in 1907 to 64,113 in 2004) in comparison to males (from 25,939 to 68,395). These increases are mostly due to population growth.

Each year there have been thousands more male deaths than female, reflecting the greater male death rates. The greatest difference was 12,800 more male deaths in 1969, due mainly to the highest number of male deaths for cardiovascular disease, lung cancer and some respiratory conditions. The rise in number of deaths over the century and the ratio of males to female deaths are shown in Figure 2.17.



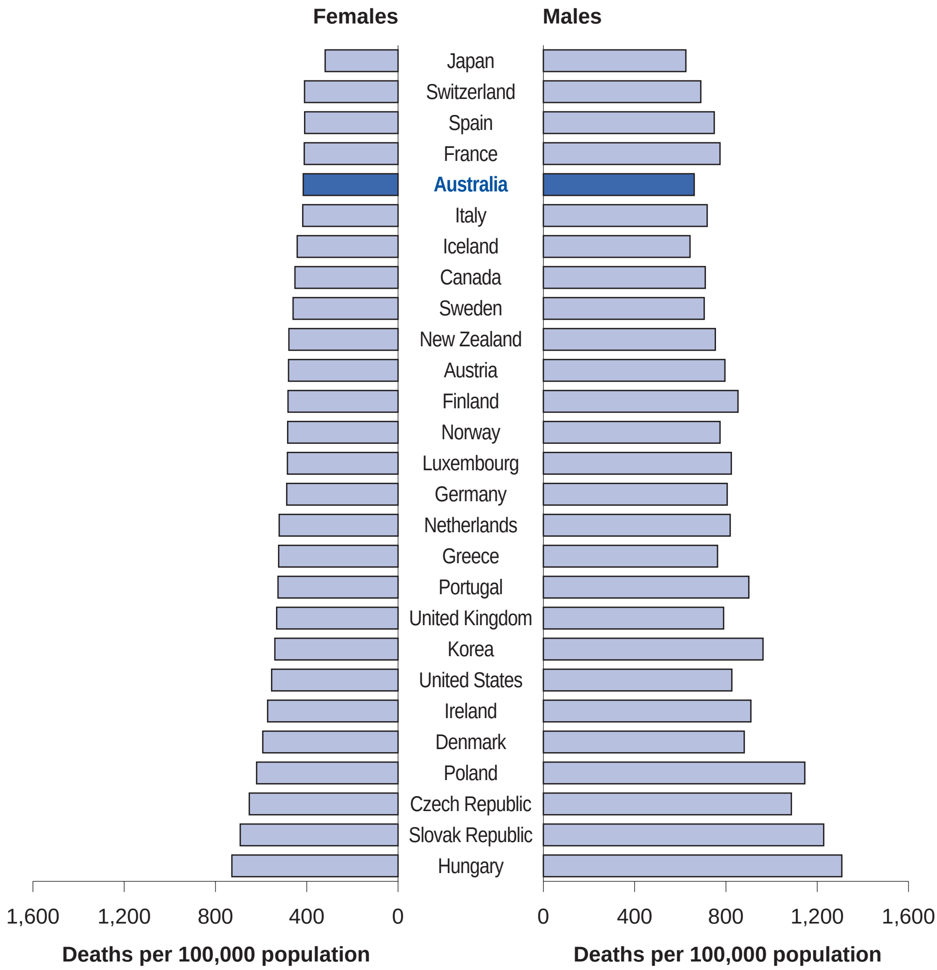
Note: The male:female difference is calculated by deducting the number of deaths among females from the number among males.

Source: AIHW National GRIM Books.

Figure 2.17: Trends in number of deaths, 1900 to 2004

International comparisons

Among developed countries, Australia has a low overall death rate (Figure 2.18). The age-standardised male death rate of 661 per 100,000 in 2001–2002 ranked third lowest among OECD countries, and the female death rate of 415 ranked fifth lowest. Japan had the lowest death rates for both males (624) and females (319). Rates in Eastern European countries such as Hungary, the Czech Republic, the Slovak Republic and Poland are considerably higher.



Notes

1. Data for Denmark and New Zealand are for 2000; data for other countries are for either 2001 or 2002 (latest year available).
2. Rates have been age-standardised to the OECD 1960 population.

Source: OECD 2005.

Figure 2.18: All-cause death rates among developed countries, 2000–2002

Substantial reductions in death rates, especially for persons in older age groups, have led to increases in life expectancy. In 1960, average life expectancy across OECD countries was 68.5 years; by 2003 this had risen to 77.8 years. Implicated in these rises have been rising living standards and national incomes, improved lifestyles and better education, along with better access to health care and more affordable medicines (OECD 2005).

Associated 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. The information is useful for further assessing the contribution of a disease or condition to mortality.

In assessing the contribution of various disorders, it may be useful to examine the underlying cause of death as a proportion of all listings, both underlying and associated (Table 2.22). When cancer is listed it is mostly as an underlying cause of death. In 2004, it was the underlying cause of 87% of male deaths where cancer was listed and 89% of similar female deaths. On the other hand, heart failure was listed as an underlying cause of death in less than 15% of relevant listings.

Table 2.22: Selected diseases as underlying or associated causes of death, 2004 (number of deaths)

	Cause of death					
Type of cause of death	**CHD**	**Stroke**	**Heart failure**	**Diabetes**	**Cancer**	**COPD**
			Males			
Underlying	13,152	4,826	883	1,869	21,831	2,986
Associated[(a)]	7,486	4,340	6,672	4,385	3,327	4,625
Total[(b)]	**20,638**	**9,166**	**7,555**	**6,254**	**25,158**	**7,611**
Per cent underlying[(c)]	64	53	12	30	87	39
			Females			
Underlying	11,424	7,215	1,396	1,730	17,022	2,213
Associated[(a)]	5,854	4,701	7,814	3,751	2,186	2,475
Total[(b)]	**17,278**	**11,916**	**9,210**	**5,481**	**19,208**	**4,688**
Per cent underlying[(c)]	66	61	15	32	89	47

(a) The total number of deaths with the selected disease listed as an associated cause of death and not as an underlying cause of death.

(b) Total number of listings.

(c) Underlying: underlying cause of death listings/ total listings as percentage.

Source: AIHW National Mortality Database.

Multiple causes of death data provide some insights into comorbidity or disease co-occurrence. For example, they show associations between coronary heart disease (CHD), diabetes and heart failure (Table 2.23).

Of all male deaths in 2004 where CHD was listed as a cause (underlying or associated), CHD itself was the underlying cause in 64% of deaths. Diabetes was the underlying cause in only 5% of all male deaths that had CHD mentioned, while heart failure was not the underlying cause of any deaths that had CHD listed. Heart failure was not often listed as an underlying cause in its own right, being the underlying cause less than 1 in 8 times it was mentioned. CHD was the underlying cause of death in 35% of heart failure listings among males.

In contrast to heart failure, diabetes featured as the underlying cause in almost 1 in every 3 deaths (30%) in which it was mentioned. A further 23% of male deaths where diabetes was mentioned had CHD as the underlying cause of death. Similar patterns emerged between various causes of death in females.

No causal pathways from one disease to another can be inferred from these results. However, in combination with information about disease processes and shared risk factors, the way that certain diseases (such as CHD and diabetes) often appear together in mortality records may help us to better understand the associations between them.

Table 2.23: Correlations between underlying and associated causes of death, 2004

Underlying cause of death	Number of deaths	Listing as an underlying or associated cause of death (per cent)					
		CHD	Stroke	Heart failure	Diabetes	Cancer	COPD
				Males			
CHD	13,152	63.7	12.9	35.2	22.5	4.1	18.9
Stroke	4,826	2.9	52.7	2.8	6.2	1.5	2.9
Heart failure	883	0.0	0.9	11.7	0.8	0.3	1.7
Diabetes	1,869	5.1	4.3	4.2	29.9	0.6	1.5
Cancer	21,831	9.7	9.8	10.7	19.0	86.8	18.8
COPD	2,986	3.1	1.9	6.2	3.2	1.3	39.2
Other	22,848	15.4	17.6	29.1	18.5	5.4	16.9
All causes	**68,395**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total listings (number)	**n.a.**	**20,638**	**9,166**	**7,555**	**6,254**	**25,158**	**7,611**
				Females			
CHD	11,424	66.1	10.7	33.8	19.7	3.1	15.0
Stroke	7,215	4.0	60.6	4.3	8.4	1.6	3.1
Heart failure	1,396	0.0	1.2	15.2	1.1	0.3	2.3
Diabetes	1,730	4.8	3.5	3.8	31.6	0.5	1.2
Cancer	17,022	6.4	5.4	7.1	14.5	88.6	13.6
COPD	2,213	2.2	0.8	3.8	2.5	0.7	47.2
Other	23,113	16.4	17.9	32.1	22.2	5.2	17.6
All causes	**64,113**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total listings (number)	**n.a.**	**17,278**	**11,916**	**9,210**	**5,481**	**19,208**	**4,688**

Note: The above table should be read down columns.

Source: AIHW National Mortality Database.

2.6 Non-communicable diseases

Chronic diseases, also referred to as non-communicable diseases, contribute most to morbidity, disability and mortality in Australia. Major examples are heart disease, stroke, cancer, diabetes, asthma and osteoarthritis, among others. Some chronic diseases are now of epidemic proportions in Australia and globally (AIHW 2002).

These diseases are not new to human societies. Both prehistoric and later evidence suggests that our ancestors suffered from a variety of chronic diseases, including osteoarthritis and diabetes. However, it was not until the 20th century that these diseases began to dominate the causes of ill health. Their prevalence is now greater than at any earlier period in human history, partly because they become more common with age and human populations are generally ageing. This growing prevalence threatens economic and social development in some countries, as well as the lives and health of millions of people (WHO 2000).

The chronic diseases are too many, and too difficult to classify, for all of them to be covered in this report. Instead, a selection of the most important—those causing much of Australia's disease burden—is profiled here.

Several of the chronic diseases included in this section are accorded the status of National Health Priority Area by Australian health ministers. This is on the basis of their health impact, the potential to reduce their burden, and community concern about them. Cardiovascular disease, cancer, diabetes, asthma, and arthritis and musculoskeletal conditions fall into this category. Also included in this section are statistical profiles of COPD and chronic kidney disease.

Cardiovascular disease

The term 'cardiovascular disease' (also known as CVD, 'circulatory disease' or 'heart, stroke and vascular diseases') covers all diseases and conditions of the heart and blood vessels (see Box 2.4). Coronary heart disease (CHD), 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 additional major conditions among Aboriginal and Torres Strait Islander peoples.

Box 2.4: Cardiovascular terminology

The definition of 'heart, stroke and vascular diseases' may differ 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 2006b). Hence the data presented in this section for heart, stroke and vascular diseases may differ from that presented by the ABS.

The main underlying causal mechanism in cardiovascular disease is atherosclerosis, 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 cardiovascular disease 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 overview of the burden of cardiovascular disease, followed by statistical profiles of CHD, stroke, heart failure and rheumatic heart disease. Information is also presented on health service use. Also described are the uneven distributions of various cardiovascular diseases in Australia, health care disparities and the health disadvantage arising from these inequalities.

Burden of cardiovascular disease

Cardiovascular disease accounted for 47,637 deaths (36% of all deaths in Australia) in 2004. 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 problems or conditions. In the 2004–05 NHS, about 18% of those surveyed reported one or more long-term diseases of the circulatory system, corresponding to 3.5 million Australians (ABS 2006b).

Combining both the burden from premature mortality and extent of associated disability, cardiovascular disease was estimated to account for 17% of the overall disease burden in Australia in 2003 (AIHW: Begg et al. in press). A large proportion of this burden was due to years of life lost (YLL) to premature mortality (29% of total YLL for Australia in 2003). Years of 'healthy' life lost on account of poor health or disability (YLD) arising from cardiovascular disease accounted for 7% of Australia's total YLD in 2003. The DALY (including YLL and YLD) estimates were provisional at the time of writing.

Cardiovascular disease is the most expensive disease group in terms of direct health care expenditure, at $5.5 billion, being 11% of Australia's total allocated health system expenditure in 2000–01 (AIHW 2005c).

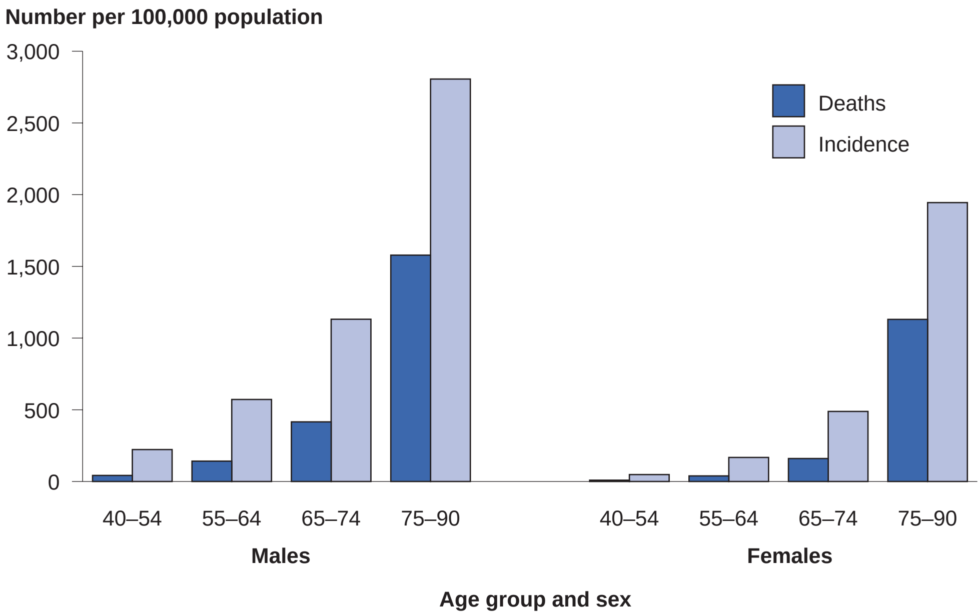
Coronary heart disease

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. Angina is a short episode of chest pain that occurs when the heart has a temporary deficiency in its blood supply due to a severe but incomplete blockage in one of its arteries.

In the 2004–05 NHS, about 1.7% of respondents indicated they had CHD, corresponding to around 334,500 Australians (ABS 2006b). Based on these responses, it is estimated that around 214,400 Australians had angina and 152,200 people had another form of the disease (note that a person may report more than one disease). The prevalence of self-reported angina was higher among males than females, at 1.3% and 0.9% respectively, but no other differences were noted between the two sexes.

The prevalence of CHD increases with age. Around 2% of Australians aged 55–64 years reported angina, the proportion increasing to 8% among those aged 75 years or over. Similarly, the prevalence rate for other forms of CHD rose from around 2% for people aged 55–64 years to 5% for those aged 75 years or over (ABS 2006b).

It is difficult to estimate the incidence of CHD. Jamrozik and others (AIHW: Jamrozik et al. 2001) developed a method for determining the incidence of 'major coronary events' from CHD deaths and non-fatal AMI hospital separations. Using this method, about 49,800 such events are estimated to have occurred in Australia in 2003 among those aged 40–90 years. Less than half of these events (21,480 cases) were fatal. The incidence rate for CHD events was higher among males than females at every age. As a ratio, the differential decreased with age: the male incidence rate for ages 40–54 years was more than four times as high as that for females, while for those aged 75–90 years the ratio was 1.4. Both male and female incidence rates increased with age (Figure 2.19).



Sources: AIHW National Hospital Morbidity Database; AIHW National Mortality Database.

Figure 2.19: Coronary heart disease incidence and mortality, ages 40–90 years, 2003

CHD is one of the major causes 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, 49% needed help or had difficulties with self-care, mobility or communication.

CHD is the largest single cause of mortality in Australia, accounting for 24,576 deaths (19% of all deaths) in 2004. The number of CHD deaths increases greatly with age: around 73% of all CHD deaths occur among those aged 75 years or over, while around 5% occur among those aged under 55 years. The male CHD death rate in 2004 was almost twice as high as the female rate.

CHD death rates have fallen rapidly since the 1970s (Figure 2.20). In the last decade alone (1995 to 2004), the age-standardised CHD death rate declined by about 39% in both males and females. These declines are likely to be due to both a reduction in heart attacks and better survival.

Cerebrovascular disease

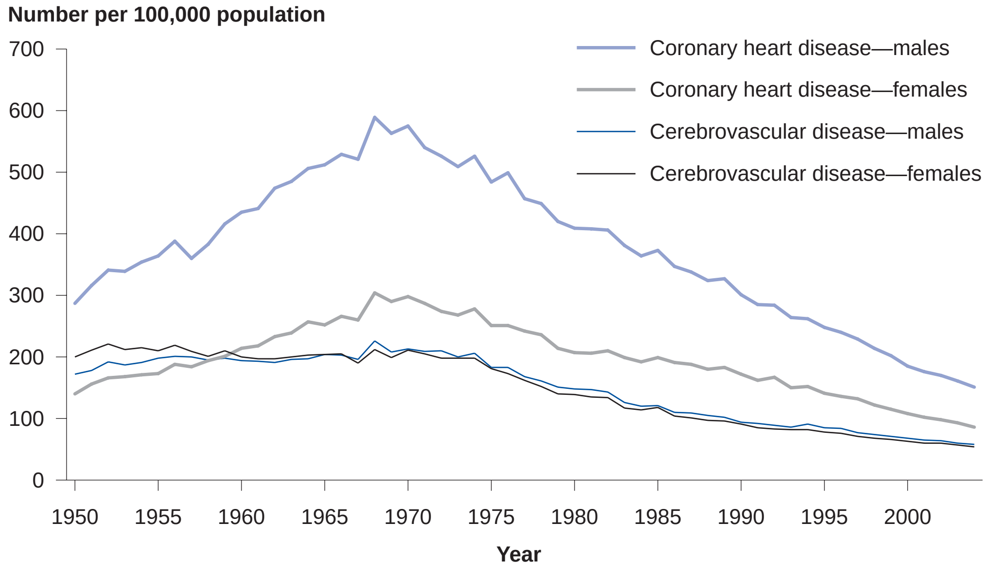
Cerebrovascular disease refers to any disorder of the blood vessels supplying the brain and its covering membranes. Most cases of cerebrovascular death are due to stroke. Stroke occurs when a blood vessel to the brain is suddenly blocked or bleeds. This may result in part of the brain dying due to the 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.

An estimated 40,000 to 48,000 stroke events occur in Australia every year—one every 11–13 minutes. The majority of these, around 70%, are first-ever strokes (AIHW 2004c). Based on the latest Survey of Disability, Ageing and Carers, an estimated 346,700 Australians in 2003 had had a stroke at some time in their lives. Of those who reported having had a stroke, four out of five 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 large cause of disability. About 282,600 persons having a history of stroke in 2003 also reported a disability, representing 7% of all people with disability. In about half of these cases, the disability was mainly attributed to the stroke. Stroke survivors with a disability were much more likely to have a profound core activity limitation than the average person with a disability. This means that the person is unable to do, or always needs help with, communication, mobility or self-care (AIHW: Senes 2006).

Cerebrovascular disease accounted for 12,041 deaths (9% of all deaths) in 2004. Most of these deaths (83%) occurred among those aged 75 years or over. More females than males (7,215 compared with 4,826) died of cerebrovascular disease. However, the age-standardised death rate was slightly higher among males, reflecting the high number of deaths among males in younger age groups.

Mortality from cerebrovascular disease has been on the decline in recent decades. There was no downward trend in the death rates between 1950 and 1975. However, since then, consistent declines have been noted for both males and females. Age-standardised death rates for cerebrovascular disease fell by about 32% and 31% over the period 1995 to 2004, among males and females, respectively (Figure 2.20).



Note: Age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Mortality Database.

Figure 2.20: Death rates for coronary heart disease and cerebrovascular disease, 1950 to 2004

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 to undertake physical activity, and shortness of breath.

Based on 2004–05 NHS self-reports, an estimated 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) (ABS 2006b). More than two-thirds of these were females. There are no national data on the incidence of heart failure in Australia. Based on overseas findings, however, it is estimated that around 30,000 new cases are diagnosed each year in Australia (AIHW: Field 2003).

Heart failure accounted for 2,279 deaths in 2004, with 90% of these occurring among people aged 75 years or over (ABS 2005e). More females than males (1,396 compared with 883) died of heart failure. The condition is more likely to be listed as an associated cause of death than as the underlying cause. It occurs frequently as an associated cause when the underlying cause of death is kidney failure (occurring in 29% of deaths), CHD (24%), diabetes (18%) or chronic lower respiratory disease (17%). (Also see Section 2.5.)

Acute rheumatic fever and chronic rheumatic heart disease

Acute rheumatic fever and rheumatic heart disease are rare in Australia except among Indigenous 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). In 2004, there were 35 registrations of people with acute rheumatic fever in the Top End of the Northern Territory and 24 in Central Australia—all registrations in Central Australia and all but two in the Top End were of Indigenous Australians. In both registers, 29% of cases were recurrences. The peak age of incidence of acute rheumatic fever is 5–14 years. In 2004, 63% of all cases of acute rheumatic fever occurred in this age group (Table 2.24) and all cases reported occurred in Aboriginal and Torres Strait Islander children.

In 2004, there were 881 people with chronic rheumatic heart disease registered in the Top End of the Northern Territory and 252 people in Central Australia. Almost all of these (91% and 95%, respectively) were Indigenous Australians. Two-thirds of cases in both areas were in the 15–44 years age group.

As would be expected, the death rates for Indigenous Australian males and females due to rheumatic heart disease are far higher than for other Australians, 16 and 22 times as high, respectively, over the period 2000–04.

Table 2.24: Incident cases of acute rheumatic fever and prevalent cases of chronic rheumatic heart disease, selected regions, 2004

Region	Acute rheumatic fever (5–14 year olds)	Chronic rheumatic heart disease (all ages)
Top End of the Northern Territory	23	881
Central Australia	14	252

Sources: Top End Rheumatic Heart Disease Register; Central Australian Rheumatic Heart Disease Register.

Health service use

The treatment and care of people with cardiovascular disease covers a variety of settings and phases of care. This section presents data on care provided by GPs and on hospital separations.

GP visits

Cardiovascular conditions constitute one of the most common problems treated by GPs, accounting for 11% of all problems managed in general practice in 2004–05 (AIHW: Britt et al. 2005). Overall, GPs managed cardiovascular problems at a rate of 16 per 100 encounters with their patients.

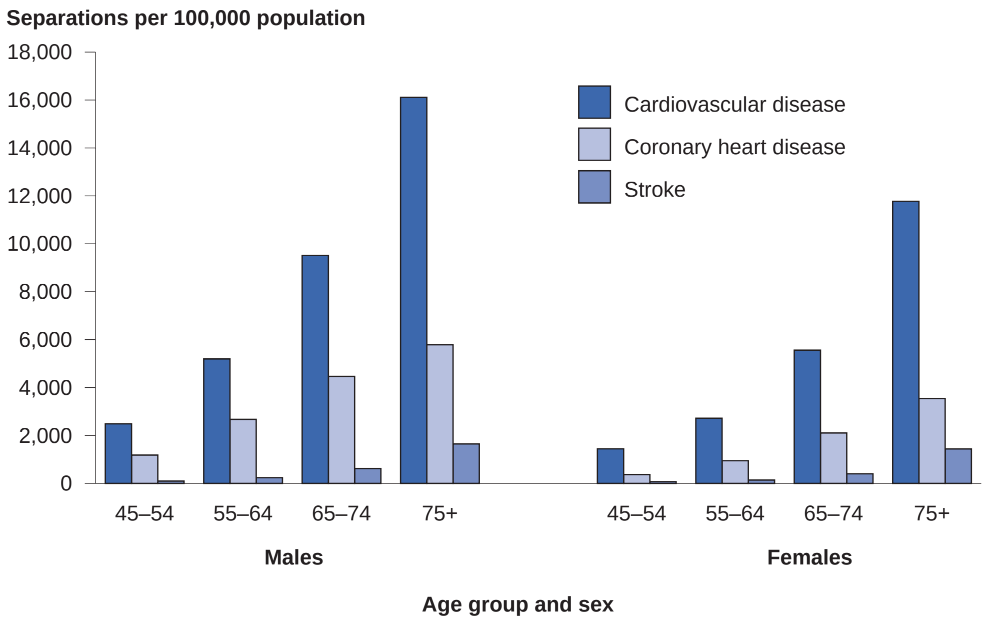
High blood pressure was the most commonly managed cardiovascular problem, at a rate of 8.9 per 100 encounters, accounting for over half of all cardiovascular problems managed. Lipid disorders (abnormal levels of cholesterol or related substances in the blood) were managed at a rate of 3.3 per 100 encounters.

Other relatively common cardiovascular problems managed by GPs were CHD, cardiac check-ups, atrial fibrillation or flutter, and heart failure.

Hospital separations

Cardiovascular disease was the principal diagnosis for 448,859 hospital separations (7% of all separations) in 2003–04. Of these, 37% were due to CHD, 14% to heart rhythm disorders, 9% to heart failure, 7% to stroke, 6% to peripheral vascular disease and 0.5% due to acute rheumatic fever and chronic rheumatic heart disease.

Among those aged 45 years or over, male CHD hospital separation rates were almost twice as high as those for females in 2003–04 (Figure 2.21). The number of hospital separations for cardiovascular disease increases rapidly with age, with those aged 55 years or over accounting for 77% of separations.

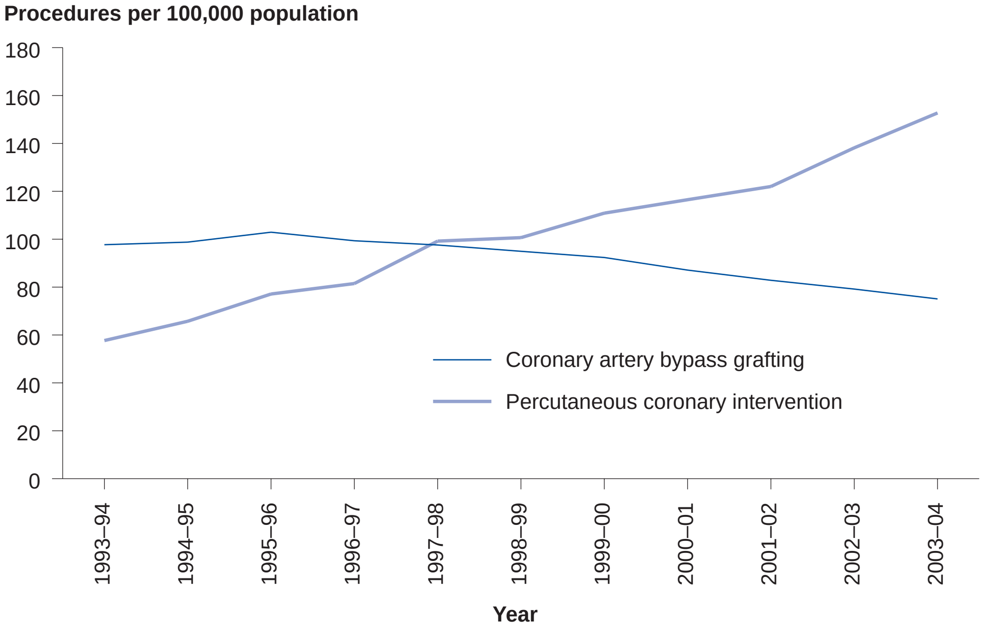


Source: AIHW National Hospital Morbidity Database.

Figure 2.21: Hospital separations for cardiovascular disease, ages 45 years or over, 2003–04

For those hospitalised for cardiovascular diseases for at least one night in 2003–04, the average length of stay was 6.3 days, a substantial reduction from 9.5 days in 1993–94. The average lengths of stay for stroke, peripheral vascular disease, rheumatic fever and rheumatic heart disease were at least twice as long as that for CHD. Females had a longer average length of stay than males.

The number of procedures performed in hospital to diagnose and treat people with cardiovascular disease has continued to increase. Prominent among these procedures are coronary angiography, percutaneous coronary interventions (PCI) and coronary artery bypass grafting (CABG). Over the period 1993–94 to 2003–04, there was a doubling in the use of PCI, which includes coronary angioplasty and coronary stenting. By contrast, the number of CABG procedures declined by 16% (Figure 2.22). However, both PCI and CABG are used to remove artery blockages and it should be noted that 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 2.22: Trends in cardiovascular procedures, 1993–94 to 2003–04

Socioeconomic inequalities and cardiovascular disease

Substantial socioeconomic inequalities exist in the effects of cardiovascular diseases. These inequalities are shown by mortality and hospital separation patterns among those aged 25–74 years.

In 2002, people from the most disadvantaged areas of Australia had significantly higher death rates from all cardiovascular diseases combined, as well as specifically from CHD and stroke. Compared to those from the least disadvantaged areas, their death rates were between 1.5 and 2.0 times as high. The total number of cardiovascular disease deaths is large and there are also graded differences between other ranks of disadvantage. The result is that the overall impact of socioeconomic disadvantage is high.

To illustrate this point, if all areas experienced the same death rates as those in the least disadvantaged fifth of Australians, around 28% of deaths in 25–74 year olds from cardiovascular diseases as a whole, 32% of deaths from CHD and 24% of deaths from stroke could have been avoided in 2002. This translates to almost 3,500 cardiovascular disease deaths, which includes 2,300 CHD deaths and 430 stroke deaths (AIHW 2006b).

These inequalities are also seen in hospital separations for cardiovascular diseases, which reflect both underlying levels of the disease as well as treatment patterns. In 2003–04, people living in the most disadvantaged areas of Australia had hospital separation rates for all cardiovascular diseases, for CHD and for stroke that were between 1.2 and 2.2 times as high as for people living in the least disadvantaged areas.

The impact of these inequalities is again illustrated in the very large number of hospital separations that would have been avoided if all areas experienced the same separation rates as those in the least disadvantaged fifth. In 2003–04, almost 40,300 hospital separations for cardiovascular diseases fell into this group, including over 21,000 for CHD emergencies and almost 3,100 for stroke (AIHW 2006b).

While there is already substantial socioeconomic inequality reflected in cardiovascular diseases statistics, this inequality may be increasing. Between 1992 and 2002, the proportion of excess deaths due to socioeconomic inequality increased for cardiovascular diseases overall (from 21% to 28%), as well as for CHD (from 23% to 32%) and stroke (from 16% to 24%). Also, relative inequality in hospital separations for CHD events increased between 1996–97 and 2003–04.

Diabetes

Diabetes mellitus (diabetes) is a metabolic disease in which high blood glucose levels result from defective insulin secretion, insulin action or both (WHO 1999). There are several types of diabetes, with different causes and clinical histories, with the three main types being Type 1, Type 2 and gestational diabetes (Box 2.5).

Box 2.5: Types of diabetes

Type 1 diabetes is marked by a total or near-total lack of insulin and results from destruction of insulin-producing cells in the pancreas. It is the most common type of childhood diabetes. People with this form of diabetes require daily insulin therapy to survive.

Type 2 diabetes is marked by reduced levels of insulin or the inability of the body to use insulin properly (insulin resistance). It is more common among people aged 45 years or above. It can be treated with oral hypoglycaemic (glucose-lowering) drugs, but some people may also need insulin therapy.

Gestational diabetes is a form of diabetes that develops during pregnancy in some women. It involves high blood sugar levels appearing for the first time during pregnancy, and affects women who have not previously been diagnosed with other forms of diabetes. It is a transient form of diabetes and usually disappears after the baby is born; however, it can recur in later pregnancies. It is also a marker of increased risk of developing Type 2 diabetes later in life.

Diabetes imposes a large burden on the health system and on some communities, accounting for 5.8% of the overall disease burden in Australia in 2003 (AIHW: Begg et al. in press). It causes much disability and poor quality of life, and is associated with morbidity and premature death, especially if undetected or poorly controlled.

Risk factors for diabetes

Many factors contribute to the onset and development of diabetes. Type 1 diabetes is believed to be caused by particular biological interactions and exposure to environmental agents among people genetically predisposed to diabetes (Atkinson & Eisenbarth 2001). Several modifiable risk factors play a role in the onset of Type 2 diabetes, including obesity, physical inactivity and poor nutrition, as does genetic predisposition and ageing. The risk factors for gestational diabetes are mostly similar to those for Type 2 diabetes, with women being at higher risk if they are of relatively advanced age or obese when they are pregnant (Virjee et al. 2001).

For further information on these risk factors, see Chapter 3: Health determinants.

Incidence and prevalence of diabetes

Incidence

Information on the incidence of diabetes in Australia is available from the National Diabetes Register. The register provides good information on the incidence of Type 1 diabetes and on other types of diabetes for the subset of cases where insulin is used to treat the disease. Together, those on the register are described as having insulin-treated diabetes. (See Box 2.6 for more detail.)

The register receives information about new cases of insulin-treated diabetes in children aged 0–14 years from two sources, and thus provides reliable estimates of the incidence

Box 2.6: National Diabetes Register

The National Diabetes Register was established in 1999, as part of the National Diabetes Strategy, to collect information about Australians who have insulin-treated diabetes. The register is operated by the AIHW using data from the National Diabetes Services Scheme and the Australasian Paediatric Endocrine Group.

The National Diabetes Register aims to collect information about all people who have diabetes for which insulin treatment was begun on or after 1 January 1999. If the register can 'capture' all its target population, it should completely monitor the incidence of Type 1 diabetes from 1999 onwards. It would also provide a guide to the onset of the more severe (insulin-requiring) cases of Type 2 diabetes and gestational diabetes. 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.

Around 59,000 people began using insulin and were registered on the National Diabetes Register between 1999 and 2004. Around 67% of registrants were found to have Type 2 diabetes and 22% Type 1 diabetes. At diagnosis, 46% of registrants were aged 45 or over and 9% were aged between 0 and 14 years.

of Type 1 diabetes in this age group. In 2004, 982 new cases of Type 1 diabetes in children aged under 15 years were recorded. This equates to an annual incidence of 24.6 per 100,000 population (around 1 in 4,000) in that age group.

In Australia, previous state-based estimates of the incidence of Type 1 diabetes in the 0–14 year age group have ranged from 12.3 per 100,000 in 1983 (Glatthaar et al. 1988) to 23.2 in 2002 (Haynes et al. 2004). Hence, the latest incidence data from the National Diabetes Register support the recent reports suggesting that the incidence of Type 1 diabetes is increasing among children.

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 NHS, in which prevalence estimates are based on self-reported information.

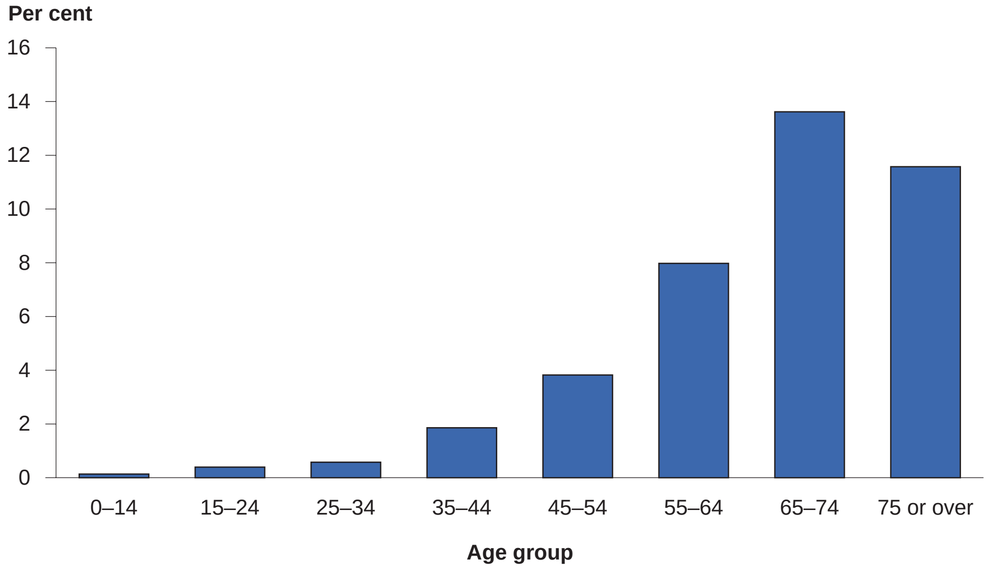
Measured data, such as those collected in the AusDiab study, provide more accurate estimates of the prevalence of diabetes than self-reported survey data. Diabetes prevalence derived from measured data can be estimated for both diagnosed and previously undiagnosed cases. The accuracy of self-reported data, such as those collected in the NHS, relies on respondents being aware of and accurately reporting their condition, and therefore will not include previously undiagnosed cases of diabetes. However, because the NHS is conducted regularly, it is able to provide more recent information and time series on the prevalence of diabetes over time.

Based on data from the AusDiab study, it has been estimated that nearly 950,000 Australian adults aged 25 years or above had diabetes in 1999–2000, constituting 7.5% of the population (more than 1 in 14 people). About half these people were not aware that they had diabetes (Dunstan et al. 2001).

From self-reported data in the 2004–05 NHS, about 699,600 Australians (3.5% of the population) had been diagnosed with diabetes (ABS 2006b). Among people with diabetes, 13% reported having Type 1 diabetes while 83% reported having Type 2; a further 4% did not know which type they had. The proportion of people reporting diabetes increased with age, and the highest prevalence rates appeared for those aged 65–74 years (Figure 2.23). Males had a higher prevalence than females (4% and 3% respectively).

Aboriginal and Torres Strait Islander peoples have a significantly higher prevalence of diabetes/high sugar levels than non-Indigenous Australians. According to the 2004–05 National Aboriginal and Torres Strait Islander Health Survey, the age-standardised prevalence of diabetes/high sugar levels among Indigenous people was 3.4 times the rate in non-Indigenous people (ABS 2006c).

The self-reported prevalence of diabetes in Australia has more than doubled since 1989–90 (Figure 2.24). While an increase in the incidence of diabetes may play a major role in trends in diabetes prevalence, rising awareness in the community and better detection of the disease may also contribute to increased reporting. However, measured data show a similar upward trend; the prevalence of diabetes estimated from the 1999–2000 AusDiab study was more than double that estimated from the 1981 Busselton survey (Dunstan et al. 2002).



Note: Based on self-reported data.

Source: ABS 2006b.

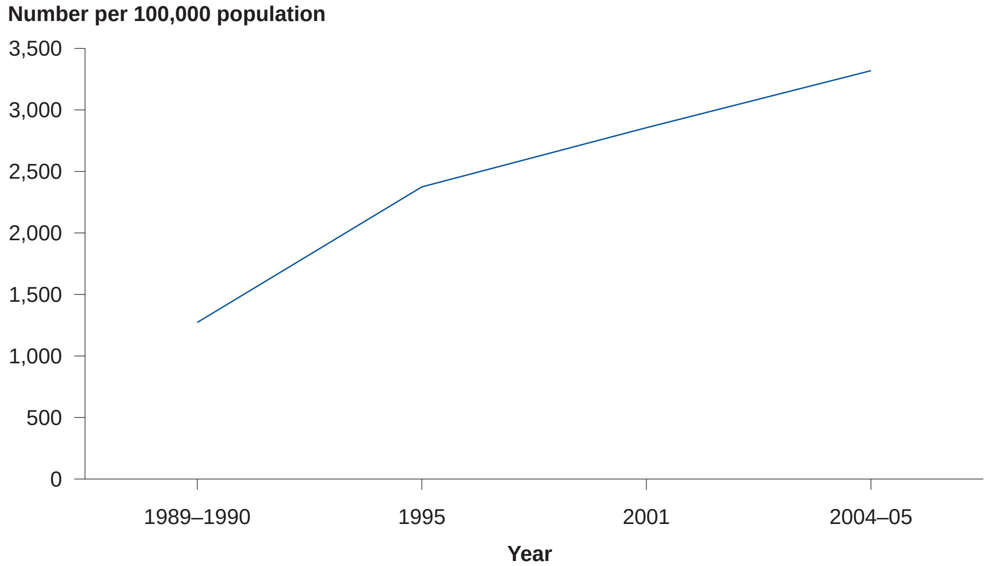
Figure 2.23: Age-specific prevalence of diabetes, 2004–05

Health outcomes of diabetes

Diabetes is a serious chronic disease which can lead to a variety of major complications, disability and premature death.

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 within a short period. These include a condition known as diabetic ketoacidosis, which can occur from a severe lack of insulin, and hypoglycaemia (low blood sugar), which is a complication of insulin treatment. There is limited information about short-term complications, although it has been found that 4.6% of people with hypoglycaemia who attended specialist diabetes services in 2004 had suffered at least one episode of severe hypoglycaemia in the previous 12 months (Flack & Colagiuri 2005).



Notes

1. Age-standardised to the 2001 Australian population.
2. Based on self-reported data.

Sources: AIHW analysis of the 1989–90, 1995 and 2001 ABS National Health Surveys; ABS 2006b.

Figure 2.24: Trends in the prevalence of diabetes, 1989–90 to 2004–05

Long-term complications include disease of large blood vessels (macrovascular disease) that leads to conditions such as CHD, 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).

According to the 2004–05 NHS, 20% of people with diabetes also reported having one or more types of 'heart, stroke or vascular diseases' as defined by the ABS, compared with only 4% of the general population (ABS 2006b). Type 2 diabetes was also the most common cause of severe (end-stage) kidney disease. In 2004, 576 people began kidney replacement therapy (dialysis or kidney transplant) due to diabetes, accounting for 30% of all new cases registered in the Australia and New Zealand Dialysis and Transplant Registry for that year (McDonald et al. 2006).

Among people attending specialist diabetes services in 2004, at some time previously 9.0% had suffered 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 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.

Disability

From the ABS 2003 Survey of Disability, Ageing and Carers, it was estimated that about 355,800 persons with diabetes had a disability. Of these, about 85,900 reported diabetes as their main disabling condition.

There were 148,400 persons reporting diabetes who also reported having a severe or profound core activity limitation, which means that they sometimes or always needed personal assistance or supervision with activities of self-care, mobility and communication. About 112,000 persons needed assistance with core activities at least once a week.

Mortality

A total of 11,735 deaths in Australia in 2004 were related to diabetes. Diabetes was listed as the underlying cause of 3,599 deaths (2.7% of all deaths) and as an associated cause in 8,136 deaths (6.1% of all deaths).

Where diabetes was an underlying cause of death, common conditions listed as associated causes included CHD (in 52.3% of cases), kidney failure (25.3%), heart failure (18.5%) and stroke (17.2%). When diabetes was listed as an associated cause, CHD was listed as the underlying cause of death in 30.5% of cases and stroke in 7.5% of cases.

The death rate for diabetes increases progressively with age: about 86.0% of people who died with diabetes in 2004 were aged 65 years or over. Males were more likely to die from diabetes than females, with age-standardised death rates of 21.0 and 13.8 per 100,000, respectively. Although there has been an increase in the prevalence of diabetes in the population, the age-standardised death rate for diabetes as the underlying cause of death was stable for males and slightly decreased for females, over the period 1997–2004.

Health service use

The first aim of diabetes management is to prevent complications, primarily by maintaining normal blood glucose levels. The second is to detect and treat any complications early. This requires frequent attention and monitoring by the patient, their doctor and other health professionals. People with diabetes are therefore more likely to consult health professionals or use hospital services than those without diabetes.

Recent data suggest that health service usage by people with diabetes is increasing. This may reflect the increasing prevalence of diabetes, but may also be due to greater compliance with guidelines for the management of diabetes, and rising awareness of diabetes and its complications.

GP visits

According to the 2004–05 BEACH survey, diabetes represented 2.2% of all problems managed by GPs, at a rate of 3.2 per 100 encounters (AIHW: Britt et al. 2005). There has been a gradual increase in this proportion since 1999–00, when the corresponding figure was 1.8% (at a rate of 2.7 per 100 encounters).

Diabetes represented 2.7% of problems referred by GPs to specialists and other health professionals in 2004–05. It was the second most common problem to be referred in that year.

Hospital separations

Diabetes was the principal diagnosis for 66,716 separations in 2003–04 and an additional diagnosis for 407,148 separations; together these accounted for 6.9% of all hospital separations in that year. Diseases of the circulatory system were the most common principal diagnoses associated with diabetes separations (15% of all diabetes-associated separations).

As well as diabetes accounting for a large proportion of hospital separations, the average length of stay for diabetes-associated separations was longer than the overall average: 5.1 days for diabetes as the principal diagnosis and 6.7 days as an additional diagnosis, compared with 3.4 days for all hospital separations.

Where diabetes was the principal diagnosis, males had higher hospital separation rates than females (339 and 317 separations per 100,000 respectively). The rate increased with age, with 59% of separations occurring among people aged 65 years or over. About 28% of hospital separations for diabetes as the principal diagnosis were for eye complications (ophthalmic), 13% for multiple complications, 10% for poor control and 10% for diabetes complicating pregnancy.

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. They are a large cause of mortality in Australia and also contribute much to morbidity and disability.

This section describes current incidence and mortality for all cancers and for National Health Priority Area cancers, quantifies the prevalence of cancer in the general community, and presents some international comparisons for cancer incidence and mortality. The National Health Priority Area cancers are lung cancer, melanoma skin cancer, non-melanocytic skin cancers, cancer of the cervix, breast cancer, colorectal cancer, prostate cancer and non-Hodgkin's 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 2.7).

Incidence

Excluding non-melanocytic skin cancers, around 101,000 new cases of cancer (55,000 males and 46,000 females) are expected to be diagnosed in Australia in 2006 (AIHW, AACR & NCSG 2005). The projected incidence rate in 2006, of 460 cases per 100,000 persons, will be slightly higher than the incidence a decade earlier, but much higher than the rate two decades ago—390 cases per 100,000 in 1986 (Table 2.25).

Much of the increase in the incidence of cancer in the decade between 1986 and 1996 may be attributed to better diagnostic techniques and the establishment of screening systems. There were large increases in the diagnosis of prostate cancer, the most common cancer in males, due mainly to the introduction of prostate-specific antigen (PSA) testing. Similarly, for breast cancer, the most common cancer in females, the introduction of a national mammographic screening program (BreastScreen Australia) and improved detection of small-diameter breast cancers may have contributed to those large increases.

Cancer incidence is higher among males than in females. Major contributors to this higher incidence are smoking-related cancers, melanoma and mesothelioma. These excess cancers have their origins up to 35 years earlier, in the higher smoking rates among males, and their higher exposure to the sun and to asbestos. In 2006, there will be an estimated 8,300 new cases of smoking-related cancers among males compared with 3,500 among females; 5,900 new cases of melanoma among males compared with 4,400 among females; and 590 new cases of mesothelioma among males compared with 150 among females (AIHW, AACR & NCSG 2005).

Table 2.25: Incidence of selected cancers, 1986 to 2011

	Year					
Type of cancer	**1986**	**1991**	**1996**	**2001**	**2006(a)**	**2011(a)**
			New cases			
All cancers(b)	53,286	65,921	78,631	88,398	100,976	115,443
NHPA cancers(b)						
Colorectal cancer	8,056	9,705	11,026	12,844	14,643	16,922
Prostate cancer (males)	4,291	6,748	10,249	11,191	12,929	15,202
Breast cancer (females)	6,081	8,043	9,742	11,791	13,261	14,818
Melanoma	4,711	5,935	7,787	8,885	10,281	11,653
Lung cancer	6,349	7,167	7,768	8,275	9,187	10,302
Non-Hodgkin's lymphoma	1,839	2,532	3,089	3,499	4,217	4,871
Cervical cancer (females)	1,019	1,089	940	735	582	461
			Incidence rates(c)			
All cancers(b)	389.9	430.4	458.4	455.4	459.6	462.3
NHPA cancers(b)						
Prostate cancer (males)	82.7	110.2	136.9	128.5	127.8	127.8
Breast cancer (females)	85.0	100.5	109.2	117.2	117.3	117.3
Colorectal cancer	60.3	64.4	64.9	66.2	66.2	66.7
Melanoma	32.9	37.5	44.7	45.8	47.4	48.2
Lung cancer	45.7	46.4	45.3	42.6	39.5	40.8
Non-Hodgkin's lymphoma	13.4	16.4	18.0	18.0	19.2	19.6
Cervical cancer (females)	14.0	13.2	10.4	7.3	5.7	3.9

(a) Projections (AIHW, AACR & NCSG 2005).

(b) Excludes non-melanocytic skin cancers.

(c) Incidence rates, given as per 100,000 persons, were age-standardised to the Australian population as at 30 June 2001.

Source: National Cancer Statistics Clearing House, AIHW.

The number of new cases of cancers is projected to increase to 115,000 by 2011, a 14% increase on 2006. Some of this projected increase is on account of population growth. But because cancer mainly emerges later in life, the number of new cases will increase relatively rapidly in line with strong growth of the population aged 50 years or over.

Box 2.7: Cancer surveillance and monitoring in Australia

The registration of 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, radiation oncologists (cancer specialists), cancer treatment centres and nursing homes.

All state and territory cancer registries supply records of all new cases of cancer (since 1982), excluding non-melanocytic skin cancers, 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 (AACR). Both the Australian Institute of Health and Welfare Act and Australian Government privacy law provide for the protection of confidentiality of records supplied to the NCSCH. In addition to generating national statistics, the NCSCH enables data to be released to researchers after a strict scientific and ethical review process which involves the AACR executive, the AIHW Ethics Committee, and the state and territory cancer registries.

This increase in numbers does not, however, necessarily translate into increased rates of incidence (Table 2.25).

The current risk of a diagnosis of cancer in Australia by age 75 years is 1 in 3 for males and 1 in 4 for females. The risk increases to 1 in 2 for males and 1 in 2.6 for females by the age of 85 years.

Most common cancers

Prostate cancer is the most commonly registered cancer in males, with 11,191 cases diagnosed in 2001. It is followed by colorectal cancer (6,961 new cases), lung cancer (5,384) and melanoma (5,024). Together these four cancers accounted for 60% of all registered cancers in males in 2001. The average age of first diagnosis for males in 2001 was 66 years, and the median age was 69 years.

In females, breast cancer (11,791 new cases in 2001) is the most commonly registered cancer, followed by colorectal cancer (5,883 new cases), melanoma (3,861) and lung cancer (2,891). These four cancers accounted in total for 60% of all registered cancers in females in 2001. The average age of first diagnosis for females in 2001 was 64 years, and the median age was 65 years.

Non-melanocytic skin cancers

Complete incidence data on non-melanocytic skin cancers are not routinely collected by state and territory cancer registries as they are not legally notifiable. Periodic national household surveys collect data to estimate incidence of these cancers, the most common being basal cell carcinoma and squamous cell carcinoma (NCCI 2003). In 2002, there were an estimated 256,000 new cases of basal cell carcinoma and 118,000 new cases of squamous cell carcinoma, a total of 374,000. Males accounted for 56% of basal cell carcinoma and 61% of squamous cell carcinoma cases.

Prevalence of cancer

Compared with the other major chronic diseases, cancer has a relatively low prevalence. This is partly because the incidence is skewed to older age groups, and partly because the survival, duration and incidence rates for most cancers are much lower than for other chronic diseases such as cardiovascular disease, diabetes and mental disorders. However, cancers with relatively high survival rates (for example, breast and prostate cancers) are much more prevalent in the population than those with a high fatality rate (for example, lung cancer and mesothelioma).

Based on people reporting that they had been diagnosed by a doctor, an estimated 338,300 persons living in private households in 2004 had a malignant cancer (1.7% of the population). Almost 58% of these were males (ABS 2006b). A further 54,500 persons had been diagnosed with a benign cancer or a cancer of uncertain nature. The overall self-reported prevalence of cancer in Australia was 2%.

Mortality from cancer

Cancer is a large cause of mortality. In 2004, there were 37,989 deaths from cancer, which was 28.7% of all deaths (Table 2.26). Of these, 21,383 were male (31.3% of all male deaths) and 16,606 were female (25.9% of all female deaths). The average age at death was 71.6 years in males and 71.7 years in females.

Table 2.26: Trends in mortality, selected cancers, 1986 to 2004

	Year				
Cancer type	**1986**	**1991**	**1996**	**2001**	**2004**
			Number of deaths		
All cancers	27,895	31,285	34,671	36,750	37,989
NHPA cancers					
Lung cancer	5,702	6,282	6,827	7,038	7,264
Colorectal cancer	4,132	4,229	4,618	4,745	4,126
Prostate cancer (males)	1,642	2,115	2,660	2,711	2,761
Breast cancer (females)	2,230	2,513	2,623	2,585	2,641
Non-Hodgkin's lymphoma	1,003	1,234	1,406	1,514	1,475
Melanoma	680	815	912	1,069	1,209
Non-melanocytic skin cancers	204	267	369	389	364
Cervical cancer (females)	350	336	302	262	212
			Death rate(a)		
All cancers	210.2	209.3	205.2	189.3	180.7
NHPA cancers					
Lung cancer	41.6	40.9	40.0	36.2	34.6
Prostate cancer (males)	35.7	38.6	41.5	35.1	32.0
Breast cancer (females)	30.8	31.1	28.7	24.7	23.4
Colorectal cancer	31.8	28.6	27.4	24.4	19.6
Non-Hodgkin's lymphoma	7.5	8.2	8.3	7.8	7.0
Melanoma	5.0	5.4	5.4	5.5	5.8
Cervical cancer (females)	4.8	4.1	3.3	2.5	1.9
Non-melanocytic skin cancers	1.6	1.8	2.2	2.0	1.7

(a) 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 malignant 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.

The age-standardised death rate for all cancers fell from 210 per 100,000 persons in 1986 to 181 per 100,000 persons in 2004. This downward trend is in direct contrast to the underlying trend in incidence over the same period, which increased steadily before stabilising in the mid-1990s.

Among the National Health Priority Area cancers, the fall in death rates since 1986 has been the highest for cervical cancer, where the national screening program using Pap smears has been successful in detecting and treating pre-cancerous abnormalities. The death rates have also fallen for breast, lung and colorectal cancers. No change was noted in death rates for prostate cancer, non-Hodgkin's lymphoma, melanoma and non-melanocytic skin cancers between 1986 and 2004.

Mortality to incidence ratio

Given the contrasting trends in incidence and mortality for cancers as a whole, it is important to plot the mortality to incidence ratio (MIR) over time. The overall MIR was 0.4 in 2004. For specific cancers, the value ranged from 0.12 for melanoma to 0.82 for lung cancer (Table 2.27). This means that for every 100 new cases of melanoma in 2004, 12 persons died of melanoma—though not necessarily 12 of the new cases. For every 100 new cases of lung cancer, 82 persons died of lung cancer.

Table 2.27: Mortality to incidence ratio, selected cancers, 1986 to 2004

	Year				
Cancer type	**1986**	**1991**	**1996**	**2001**	**2004[(a)]**
All cancers	0.52	0.47	0.44	0.42	0.40
NHPA cancers					
Lung cancer	0.90	0.88	0.88	0.85	0.82
Non-Hodgkin's lymphoma	0.55	0.49	0.46	0.43	0.37
Cervical cancer (females)	0.34	0.31	0.32	0.36	0.33
Colorectal cancer	0.51	0.44	0.42	0.37	0.30
Prostate cancer (males)	0.38	0.31	0.26	0.24	0.23
Breast cancer (females)	0.37	0.31	0.27	0.22	0.21
Melanoma	0.14	0.14	0.12	0.12	0.12

(a) Based on AIHW projection of incidence.

Sources: AIHW National Mortality Database; National Cancer Statistics Clearing House, AIHW.

The MIR for cancers overall declined from 0.52 in 1986 to 0.40 in 2004, a decline of 23% (Table 2.27). This decline may be due to three different factors, namely improved detection of early stage cancers that might not have been found in past years, improved survival, and an increase in the proportion of cases apparently cured.

Of the National Health Priority Area cancers, major reductions in the MIR since 1986 were for non-Hodgkin's lymphoma, colorectal cancer, prostate cancer and breast cancer.

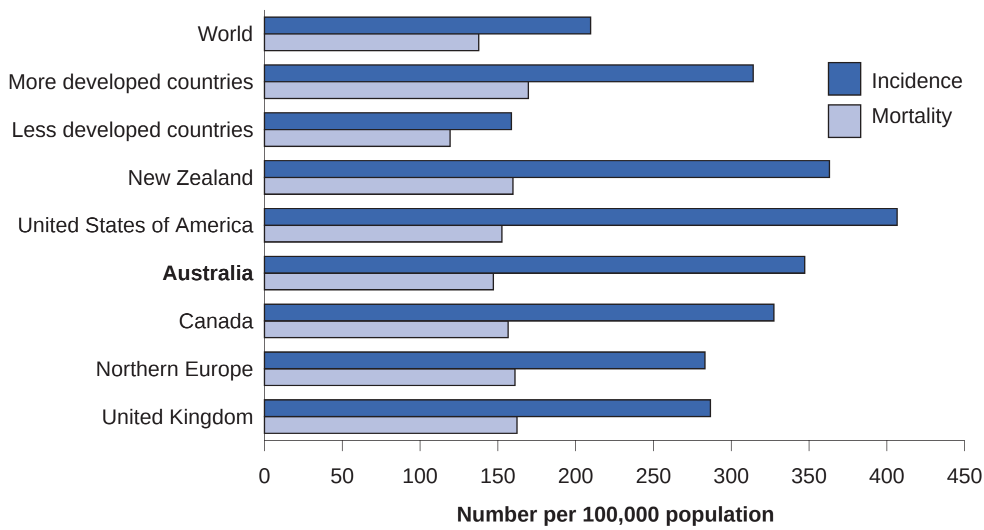
In contrast, there was little change in MIR for cervical cancer and melanoma. The National Health Priority Area cancer with the worst prognosis in 2004 was lung cancer, although some reduction (9%) in its MIR has occurred since 1986.

International comparisons

In 2002, Australia had the fifth highest rate of cancer incidence in the world for males, behind the United States of America, Hungary, New Zealand and Belgium (figures 2.25 and 2.26). It also had the fifth highest incidence of cancer among females, behind the United States of America, New Zealand, Denmark and Iceland (IARC 2005).

Australia has the highest incidence of melanoma in the world for both males and females, just ahead of New Zealand and much higher than any other country.

In contrast to Australia's high incidence, its cancer death rates are low when compared with other Western countries. Australia ranked 57th in the world for male cancer mortality and 79th for female cancer mortality in 2002.



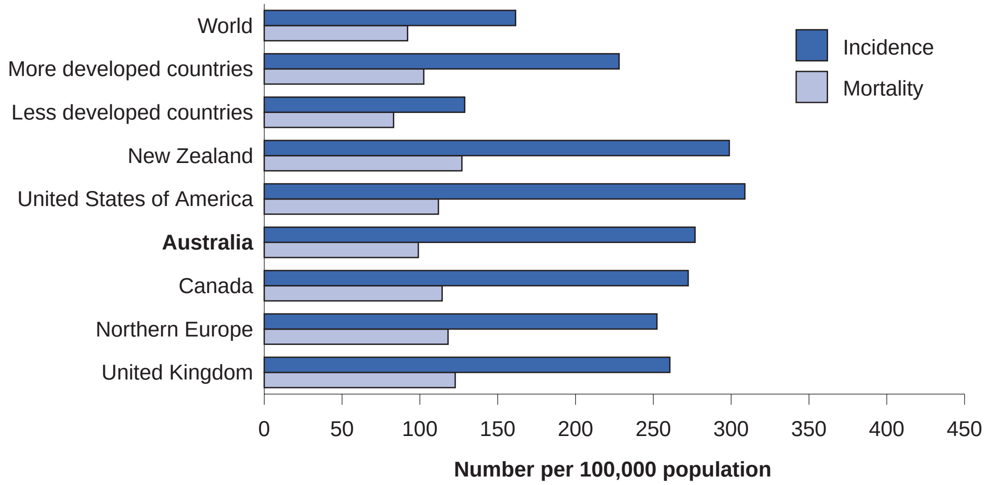
Note: Rates have been age-standardised to the World Standard Population.

Source: IARC 2005.

Figure 2.25: International comparisons of incidence and death rates for all male cancers (excluding non-melanocytic skin cancers), 2002

Chronic respiratory diseases

Chronic respiratory diseases—or conditions involving chronic obstruction or inflammation of the lungs or airways—are the major respiratory diseases contributing to illness, disability and mortality in Australia. Acute respiratory infections, such as influenza and pneumonia, are covered in the 'Communicable diseases' section of this chapter.



Note: Rates have been age-standardised to the World Standard Population.

Source: IARC 2005.

Figure 2.26: International comparisons of incidence and death rates for all female cancers (excluding non-melanocytic skin cancers), 2002

Chronic respiratory diseases are very prevalent in Australia, with an estimated 5.7 million Australians having at least one long-term respiratory disease in 2004–05. Although often incurable, they are largely preventable and manageable. Nevertheless, chronic respiratory diseases affect the wellbeing and productivity of many Australians and contribute to thousands of deaths each year. Two major chronic respiratory diseases described in this section are asthma and chronic obstructive pulmonary disease (COPD).

Asthma

Asthma is a chronic inflammatory disease causing episodes of wheezing, breathlessness and chest tightness due to widespread narrowing of the airways within the lungs and obstruction of airflow. The symptoms of an episode are usually reversible, either spontaneously or with treatment.

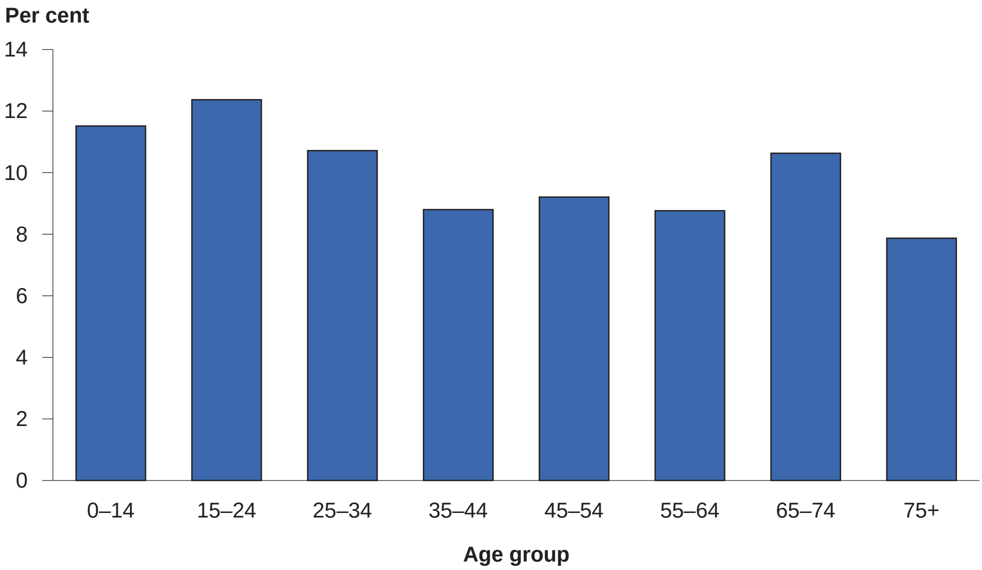
While the underlying causes of asthma are still not well understood, constitutional factors such as genetic traits, age and sex, as well as environmental factors such as diet and lifestyle, may increase the risk of developing asthma. There is a wide range of factors that trigger airway narrowing and symptoms in people with asthma, including exercise, viral infections, irritants (such as smoking and other air pollutants), specific allergens (house dust mites and mould spores) and some food preservatives.

Prevalence

Estimates based on the 2004–05 NHS indicate that over 2 million Australians currently have asthma (ABS 2006b). This represents 10.2% of the Australian population, down from 11.6% in 2001. Males have a slightly lower prevalence (9.0%) than females (11.5%).

The highest prevalence occurs in persons aged 15–24 years, where 12.4% reported asthma as a current and long-term condition (Figure 2.27).

The overall prevalence of asthma increased during the 1980s and early-to-mid-1990s. However, in recent years there is some evidence that this trend has plateaued and may even have reversed in children (ACAM 2005). However, Australia's prevalence is high by international standards (GINA 2004).



Source: ABS 2006b.

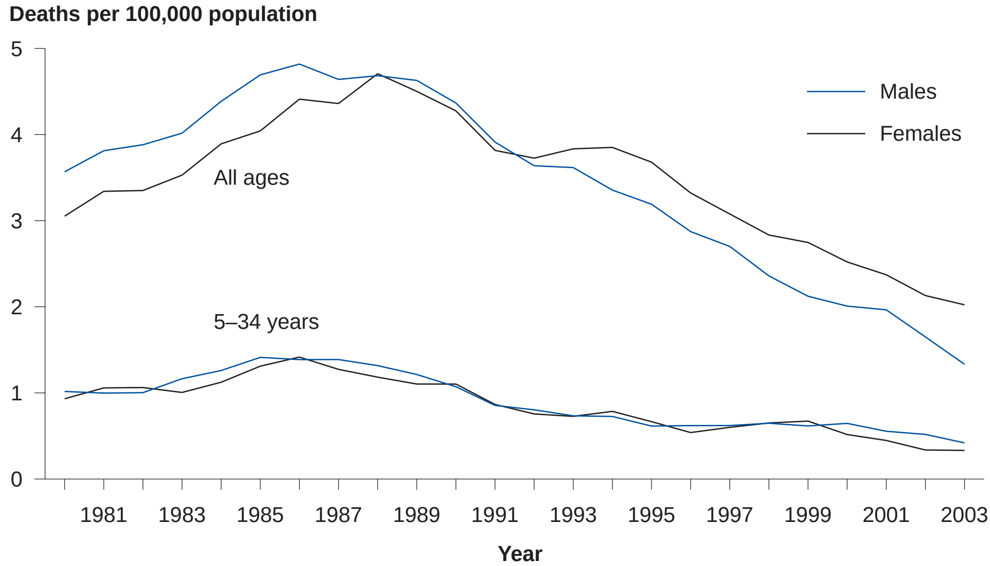
Figure 2.27: Prevalence of current asthma, by age, 2004–05

Among children, boys have a higher rate of asthma than girls. However, after teenage years, asthma is more common in females than in males. The prevalence of asthma is also higher among Aboriginal and Torres Strait Islander females, particularly those aged 35 years or over, than among other Australian females. People from non-English-speaking backgrounds have a lower prevalence of asthma than those from English-speaking backgrounds (ABS 2006b; ACAM 2005).

Mortality

Asthma is not a major cause of mortality in Australia, but the death rates are high by international standards. Asthma was attributed as the underlying cause in 0.2% of deaths in 2004. Deaths due to asthma occur in all age groups, but the risk of dying from asthma increases with age. Death rates for asthma are higher in females than in males, except among those aged 5–34 years (ACAM 2005).

The overall death rate due to asthma has more than halved since 1989 (Figure 2.28). This trend is strongest in those aged 5–34 years, which is the age at which deaths can be attributed to asthma with more certainty.



Notes

1. Age-standardised to the Australian population as at 30 June 2001.
2. Asthma was classified according to ICD-9 code 493 and ICD-10 codes J45 & 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 2.28: Trends in asthma mortality, three-year moving average, 1980–2003

General practice encounters

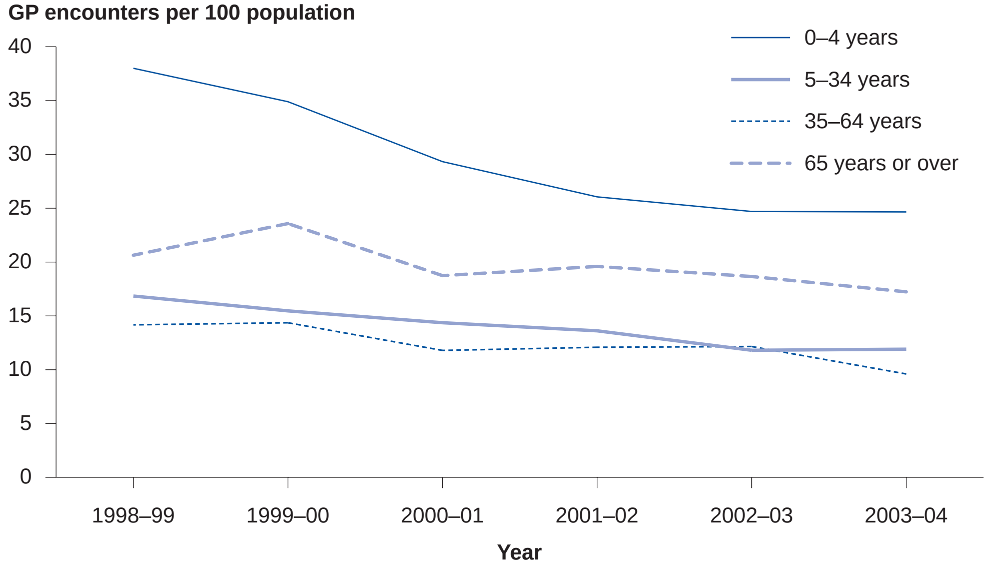
According to the BEACH surveys, the average annual rate of GP encounters at which asthma was managed was 14.5 per 100 persons during the period 1998–99 to 2003–04. This represents 2.8% of all GP encounters over that period. Children aged 0–4 years had the highest rate of asthma-related encounters; however, the rate in this age group declined by over 30% between 1998–99 and 2003–04 (Figure 2.29).

Hospital separations

Hospital separation rates for asthma are highest among children, particularly those aged 0–4 years. However, this age group has seen large overall reductions since 1993 (Figure 2.30). The average length of stay and total hospital bed-days for persons hospitalised with asthma also fell between 1993–94 and 2003–04.

Among those aged 65 years or over, hospital separation rates for asthma are highest in the winter months, whereas among children the peaks occur in February and May.

Among children, boys have higher hospital separation rates for asthma than girls, in keeping with the higher prevalence of the disease in boys. This trend is reversed after the age of 15 years, when more females than males are admitted to hospital for asthma. Indigenous people, adults living in remote locations and people living in more socioeconomically disadvantaged areas also have higher hospital separation rates for asthma than other Australians.



Notes

1. Asthma was 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, 1998–99 to 2003–04.

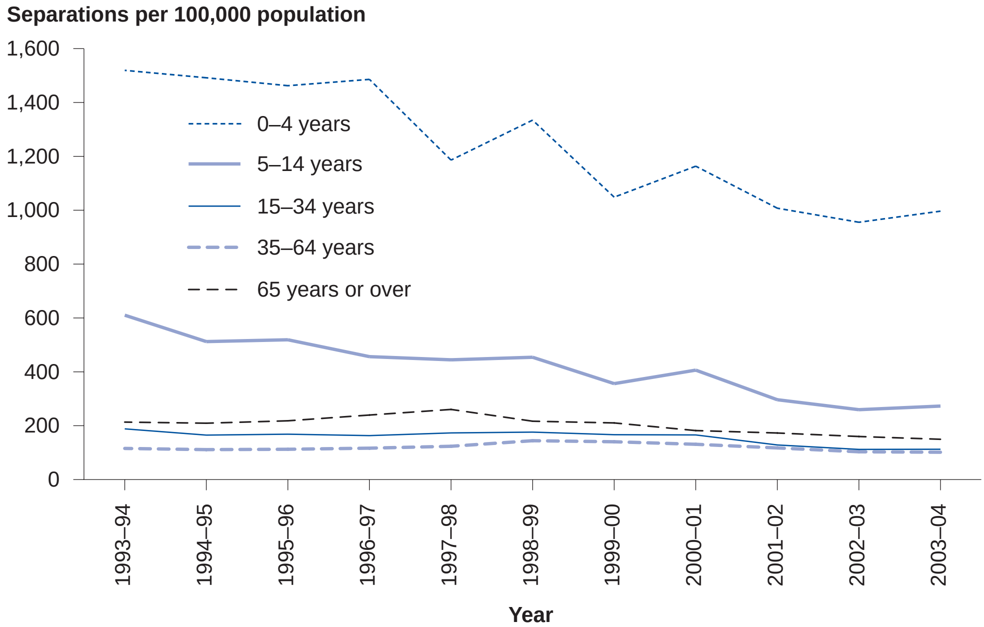
Figure 2.29: Trends in general practice encounters for asthma, 1998–99 to 2003–04

Asthma burden

Asthma was estimated to account for 2.3% of the disease burden in Australia in 2004, 0.3% of years of life lost due to premature mortality and 4% of years of 'healthy' life lost due to poor health or disability (AIHW: Begg et al. in press).

Chronic obstructive pulmonary disease

COPD is a serious long-term disease in which people have progressively worse shortness of breath on exertion. The main disease process underlying COPD is emphysema. This occurs as a result of the gradual destruction of lung tissue due to the unopposed action of enzymes stimulated by inhaled irritants. The lungs become floppy and less able to move air in and out, thereby limiting the ability of the lungs to exchange gases. People with long-term cough and phlegm are regarded as having chronic bronchitis, a condition due to over-active mucous glands in the large airways. Both emphysema and chronic bronchitis are caused mostly by tobacco smoking, so they often coexist.



Notes

1. Age-standardised to the Australian population as at 30 June 2001.
2. Asthma was classified according to ICD-9-CM code 493 and ICD-10-AM codes J45 & J46.
3. Hospital separations coded to ICD-9-CM (1993–1997) were converted to ICD-10-AM using the following conversion: ages 5 to 34 years, no conversion; 35 to 64 years, converted by a factor of 0.64; 65 years or over, converted by a factor of 0.53.

Source: AIHW National Hospital Morbidity Database.

Figure 2.30: Trends in hospital separations for asthma, 1993–94 to 2003–04

Risk factors

Tobacco smoking is by far the most important risk factor for COPD. Globally, it is estimated that 82% of deaths due to COPD are attributable to smoking (Zaher et al. 2004). Other risk factors for COPD include exposure to passive (environmental) tobacco smoke, indoor and outdoor air pollution, occupational dusts and chemicals, and viral respiratory infections (de Marco et al. 2004; Rennard 1998; Tashkin et al. 1994; Viegi et al. 1991). These risk factors may worsen respiratory symptoms or may contribute to the risk of developing COPD, either independently or in conjunction with tobacco smoking. A small percentage of people with COPD have an inherited deficiency of α-1-antitrypsin, a protein that normally inhibits the action of destructive enzymes in the lungs.

Prevalence

The prevalence of COPD in Australia is difficult to determine. There are major differences in how the disease is defined (some definitions include asthma), and the definition adopted does not always match the available data. The term COPD is not commonly used in health surveys (Mannino et al. 2002), with the terms chronic bronchitis and emphysema often used instead. Because its symptoms overlap with other conditions, the prevalence of COPD is probably overestimated among younger people and underestimated among older people, among whom it is often difficult to distinguish from asthma.

Abramson et al. (2002) have estimated the prevalence of COPD among those aged 45–69 years in Melbourne to be about 12% (96% of these cases were confirmed by a doctor's diagnosis). In the North West region of Adelaide, more than 21% of adults had breathing tests that showed evidence of airflow obstruction that was not reversible (Taylor et al. 2002). Most of these cases (about 94%) involved mild COPD with few symptoms and only 1.1% of adults had both the irreversible airflow obstruction and low lung function that is consistent with moderate or severe COPD.

Based on self-reports to the 2004–05 NHS (ABS 2006b), 3.0% of the Australian population, approximately 589,900 persons, had bronchitis and/or emphysema (down from 3.5% and 665,000 persons in 2001). Aside from the limitations of self-reports, these numbers are probably underestimates because COPD is usually not diagnosed until it is moderately advanced and begins to restrict a person's daily activities. The self-reported prevalence of bronchitis/emphysema increases with age: in the 2004–05 NHS, about 2.8% of people aged 45–54 years reported bronchitis/emphysema, with the prevalence rising to 8.8% among those aged 75 years or over (down from 10% in 2001).

Activity limitation and disability

COPD can interfere with an individual's daily activity, particularly the ability to exercise or do manual work. People with COPD become breathless while walking up stairs and eventually while walking slowly on flat ground (AIHW 2002). The ability to perform productive work decreases markedly, and often completely, within the first 7–8 years from initial diagnosis.

Estimates from the 2003 ABS Survey of Disability, Ageing and Carers indicate that about 34% of persons reporting bronchitis or emphysema had a level of disability due to those diseases. Over a third of these people had a severe or profound disability. Applied to prevalence estimates from the 2004–05 NHS, this would equate to about 71,000 Australians severely or profoundly disabled by bronchitis or emphysema. Given that the NHS is limited to private dwellings, this figure would probably be an underestimate.

Use of health care services

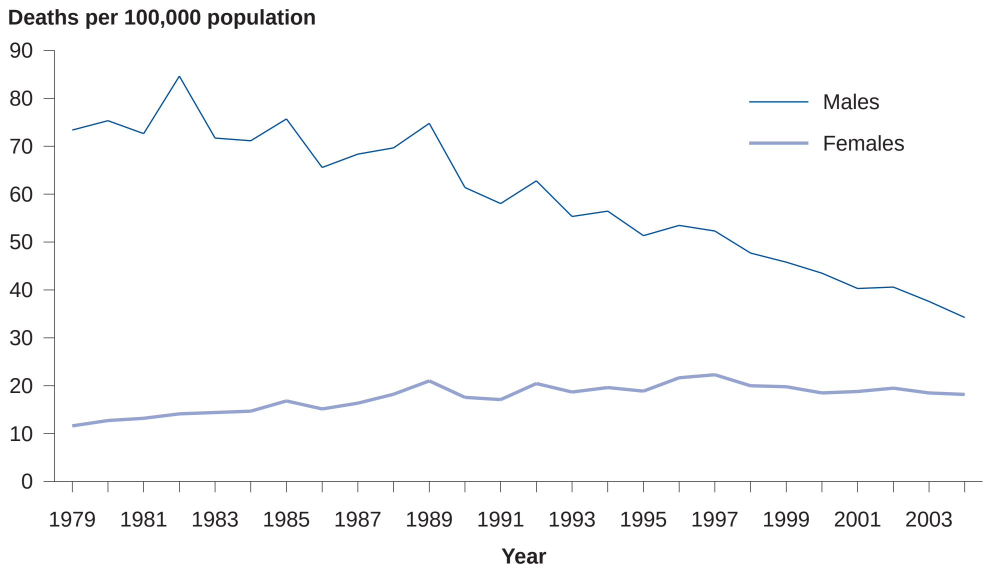
COPD is not managed often in general practice (less than 1% of encounters; AIHW: Britt et al. 2005). However, in terms of both the number of separations and the average length of time spent in hospital, COPD accounts for considerably more hospital separations than other chronic respiratory diseases such as asthma. People with COPD may require regular hospital care when symptoms worsen, lead to increased disability or become life-threatening.

In 2003–04, there were 54,281 hospital separations where the principal diagnosis was COPD, with an average length of stay of 7.5 days. Hospital separations for COPD occur mainly among the elderly, with those aged 65 years or over accounting for 78% of all COPD-related separations. Males are more likely to be hospitalised for COPD than females (the age-standardised separation rate was 337 per 100,000 males compared with 210 per 100,000 females). The male hospital separation rate has fallen in recent years (down from 353 per 100,000 in 2000–01) whereas the female rate appears to have plateaued (210 per 100,000 in 2002–03).

Mortality

COPD is a major cause of death in Australia. In 2004, COPD was the underlying cause of 5,199 deaths (3.9% of all deaths). The death rate was higher among males (age-standardised rate of 34.3 deaths per 100,000) than females (18.2 per 100,000). The average age at death from COPD was 77.8 years for males and 77.9 years for females.

The death rate for COPD among males has declined over the last three decades (Figure 2.31). Improved medical care, a higher proportion of people with established COPD who quit smoking, and improved overall non-smoking trends may all account for the decline, particularly among males. In contrast, the COPD death rate among females has remained steady since 1990. This may be the delayed result of an increase in the proportion of female smokers during the 1970s, countering the more recent fall in female smoking rates and other positive trends mentioned above.



Notes

1. Age-standardised to the Australian population as at 30 June 2001.
2. COPD classified according to ICD-9 codes 491, 492, 496 (1979–1996) and ICD-10 codes J41 to J44 (1997–2004).
3. Rates for 1979 to 1996 have been adjusted by a factor of 0.93 to be comparable with the rates for 1997 to 2004.

Source: AIHW National Mortality Database.

Figure 2.31: Trends in COPD mortality, 1979 to 2004

Patterns of starting and quitting tobacco smoking from the last few decades—together with improving COPD awareness, diagnosis and management—will largely determine current and future trends in COPD prevalence and impact.

Burden of chronic obstructive pulmonary disease

COPD was estimated to account for 3.6% of the disease burden in Australia in 2004, 3.7% of years of life lost due to premature mortality and 3.5% of years of 'healthy' life lost due to poor health or disability (AIHW: Begg et al. in press).

Arthritis and musculoskeletal conditions

Arthritis and musculoskeletal conditions are large contributors to pain and disability in Australia. Highly prevalent, they place a significant burden on the community, both economic and personal, including the use of hospital and primary care services, disruptions to daily life and lost productivity (AIHW 2005d).

More than six million Australians are estimated to have had arthritis or a musculoskeletal condition in 2004–05 (ABS 2006b). The most commonly occurring conditions are back pain and various forms of arthritis. Almost one in five persons with arthritis or a musculoskeletal condition is reported to have some disability.

In view of this large disease burden—the number of people affected and the high disability impact—arthritis and musculoskeletal conditions were declared a National Health Priority Area in 2002 (AHMC 2005). The initial focus of this initiative is on osteoarthritis, rheumatoid arthritis and osteoporosis. The following discussion focuses mainly on these three conditions.

Osteoarthritis

Based on self-reported information from the 2004–05 NHS, the most common form of arthritis, osteoarthritis, affected nearly 1.6 million Australians in that period (ABS 2006b). The condition mainly affects the hands, spine and weight-bearing joints such as hips, knees and ankles. Osteoarthritis is usually a progressive disease, becoming worse with time and often leading to functional limitations. As the disease progresses, the pain becomes more severe and incapacitating, thus affecting the wellbeing of the individual. More common among females than males, osteoarthritis rises in prevalence with age and increasing body weight.

Rheumatoid arthritis

Rheumatoid arthritis, the most common autoimmune disease in Australia, affected around 491,000 persons in 2004–05, based on self-reports from the NHS (ABS 2006b). More than half of those affected (57%) were females. The disease involves inflammation of the joints, most often affecting the hand joints in a symmetrical fashion. Disability associated with rheumatoid arthritis starts early in the disease process and can seriously compromise the quality of life. The disease also produces a range of deformities.

Osteoporosis

Osteoporosis is the thinning and weakening of the bone substance, increasing the risk of fracture and deformity. Fractures after minimal trauma are a hallmark of osteoporosis. They can reduce a person's ability to walk unassisted, and may lead to loss of independence. Estimates based on self-reported information from the 2004–05 NHS suggest that almost 600,000 Australians had osteoporosis (ABS 2006b). The disease is more common in females than males, and is mostly limited to the elderly.

Other types of arthritis and musculoskeletal conditions

More than 100 diseases are labelled as arthritis and musculoskeletal conditions. These may result from congenital anomalies, metabolic or biochemical abnormalities, infections, inflammatory conditions, cancer and trauma. Some of the common types are back pain, fibromyalgia, ankylosing spondylitis, psoriatic arthritis, systemic lupus erythematosus, polymyalgia rheumatica, reactive arthritis and arthritis associated with inflammatory bowel disease.

Effects

The impact of arthritis and musculoskeletal conditions varies considerably according to the particular condition (Table 2.28). Since these conditions affect a large proportion of the population, their overall impact is large (ABS 2002). They are the second most common reason for GP visits (AIHW: Britt et al. 2004), and are also the cause of a large number of hospital separations. Consequently, arthritis and musculoskeletal conditions are the third leading cause of health expenditure among the health disorders in Australia, with an estimated expenditure of $4.6 billion in 2000–01 (AIHW 2005c).

Table 2.28: Burden of selected arthritis and musculoskeletal conditions, various years

	Prevalence[(a)] (2004–05)		Disability (2003)		Deaths[(b)] (2004)		Disability-adjusted life years (DALYs)[(c)] (2003)	
Disease/ condition	Number ('000)	Percentage of population	Number ('000)	Percentage of population	Number ('000)	Percentage of all deaths	DALYs ('000)	Percentage of total DALYs
Osteoarthritis	1,548	7.9	. .	. .	0.1	0.1	. .	. .
Rheumatoid arthritis	491	2.5	. .	. .	0.2	0.1	. .	. .
Osteoporosis	586	3.0	337	1.7	0.2	0.1	. .	. .
All arthritis and musculoskeletal conditions[(d)]	6,092	31.0	4,246	21.5	1.0	0.8	136.6	4.9

(a) Self-reported, estimates based on 2004–05 NHS. All diseases or conditions are long-term.

(b) Deaths registered in 2004.

(c) Provisional at the time of writing.

(d) Includes osteoporosis.

Sources: ABS 2004b, 2006b; AIHW: Begg et al. in press; AIHW National Mortality Database.

Significant activity limitation is associated with arthritis and musculoskeletal conditions, in particular among persons aged 65 years or over (ABS 2004b; March et al. 1998). Those with rheumatoid arthritis are at high risk of work disability from the onset of their symptoms. Work disability is also common after the age of 50 years in persons with osteoarthritis. In some cases, the loss of functional capacity and inability to participate in recreational activities can also result in social isolation, depression and low self-esteem.

Arthritis and musculoskeletal conditions are not a large underlying cause of death. Nearly five deaths per 100,000 persons in 2004 were attributed to arthritis and musculoskeletal conditions. Some premature mortality may be recorded for people with arthritis, resulting from perforated stomach ulcers, mainly induced by the non-steroidal anti-inflammatory drugs or NSAIDs used for arthritis treatment (Graumlich 2001). Osteoporosis-related mortality is high in older people following certain types of fractures.

Despite their largely non-fatal profile, arthritis and musculoskeletal conditions are responsible for 5% (provisional at the time of writing) of the overall disease burden, measured in terms of disability-adjusted life years (DALYs), in Australia. A significant proportion of this is in terms of healthy years of life lost (AIHW: Begg et al. in press).

Special issues

The burden of arthritis and musculoskeletal conditions can be reduced through early prevention and appropriate management. There have been some encouraging developments lately in better understanding their causal mechanisms and outlining their risk factors. Better medications for their treatment, mainly to control the pain and improve functioning, have also helped to improve the quality of life of people with arthritis and musculoskeletal conditions. Some of these developments are described below.

Knee and hip replacements

A significant advancement in managing arthritis is joint replacement (knee and hip replacement, or 'arthroplasty'). These procedures are considered the most cost-effective intervention for osteoarthritis, and the final and only irreversible step in its therapy (Brooks 2001). The pain and disability of end-stage arthritis can be reduced by these procedures, restoring patients to near-normal function (Bachmeier et al. 2001).

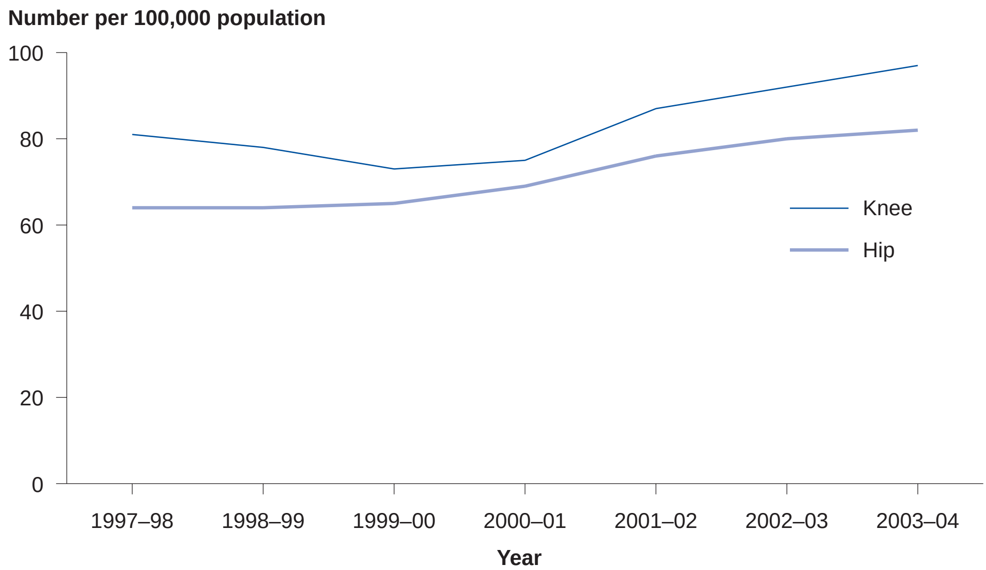
In 2003–04, a total of 36,846 total joint replacements were performed in Australia on people with the principal diagnosis of osteoarthritis. Arthroplasty of the knee was common among females, mainly in the 75–79 years age group. Arthroplasty of the hip, on the other hand, was more common among males, particularly those aged 70–74 years.

The numbers of knee and hip arthroplasties are increasing in Australia (Figure 2.32). With the ageing of the population, this trend is likely to continue further.

Early diagnosis of rheumatoid arthritis

Early diagnosis is an integral part of the current treatment approach for rheumatoid arthritis (Oliver et al. 2005). Early treatment improves outcomes in some people, limiting the pain, joint damage and disability that occurs (Taouli et al. 2002). However, rheumatoid arthritis can be difficult to diagnose in its early stages as symptoms vary in appearance and severity, and may develop slowly. Also, the symptoms can be similar to those of other types of arthritis and joint conditions, and since there is no single test for rheumatoid arthritis it can take some time to rule out other conditions.

Despite these difficulties, once the symptoms are brought to the attention of a rheumatologist they can often make an accurate diagnosis quickly. This is done through blood tests, joint X-rays showing damage or bone thinning, or magnetic resonance imaging (MRI) or ultrasound, to diagnose the disease and to rule out other conditions. Several clinical trials have shown the benefits of early diagnosis of rheumatoid arthritis, and MRI has been found to be an important tool for this purpose (Oliver et al. 2005).



Source: AIHW National Hospital Morbidity Database.

Figure 2.32: Trends in knee and hip arthroplasty for osteoarthritis, 1997–98 to 2003–04

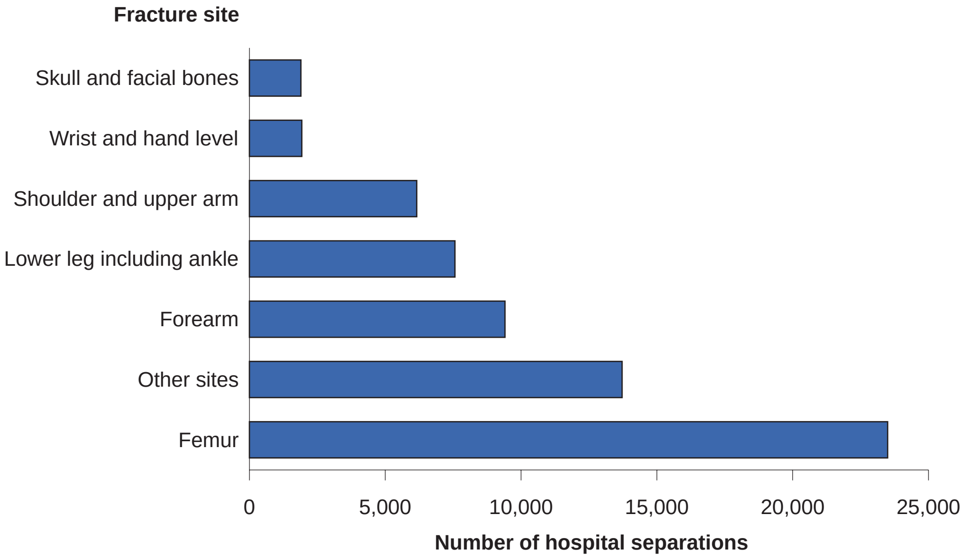
Osteoporosis and hip fractures

Fractures after minimal trauma (falls from standing height or less) are a hallmark of osteoporosis. A large proportion of fractures in people aged 55 years or over are osteoporotic in nature. Most of the vertebral (spinal) fractures occur without symptoms, almost 70% being clinically undetected. These fractures are often associated with height loss, vertebral deformity and vertebral compression. Activities such as lifting are a major cause of vertebral fractures.

Non-vertebral fractures, on the other hand, are painful and associated with swelling and deformity. In particular, hip fractures are highly debilitating and may shorten life expectancy, with almost 30% of those who have a hip fracture dying within 12 months (Woolf & Pfleger 2003). Many people with hip fractures do not regain their regular posture and mobility (Cumming et al. 1997), and the fracture almost always requires hospitalisation and major surgery.

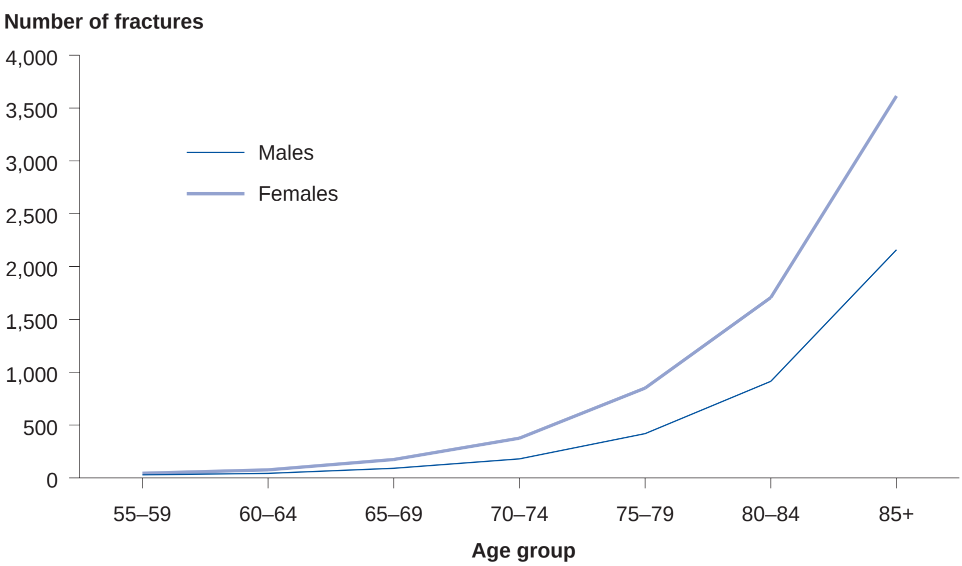
In 2003–04, hip fracture was the most common reason for hospital separations among people aged 55 years or over with an additional diagnosis of osteoporosis. This was followed by fracture of the forearm and the lower leg (Figure 2.33). Hip fractures constituted more than 37% of all fracture separations among those aged 55 years or over, and the proportion increased to 55% among those aged 85 years or over.

Falls are a major cause of hip fractures. In 2003–04, a fall was listed as the external cause of injury in 92% (21,686) of separations of persons aged 55 years or over with the principal diagnosis of hip fracture. More females than males were hospitalised, with the hospital separation rate being higher for females at all ages. Hospital separations for fall-related hip fractures increase rapidly with age, from around the age of 55 years (Figure 2.34). The rates have changed little in recent years.



Source: AIHW National Hospital Morbidity Database.

Figure 2.33: Hospital separations for common fractures, 2003–04



Source: AIHW National Hospital Morbidity Database.

Figure 2.34: Hospital separations for fall-related hip fractures, ages 55 years or over, 2003–04

The new frontier

Although the health impact of arthritis and musculoskeletal conditions is large, their effects can be reduced through early prevention and appropriate management. There have been developments in understanding their causal mechanisms, and in better understanding their risk factors. There have also been improvements in medications for their treatment. Joint replacement surgery, in particular, has revolutionised the lives of many people.

People with arthritis and musculoskeletal conditions often have other diseases and conditions such as heart and vascular diseases, Type 2 diabetes, respiratory and infectious diseases, gastrointestinal disorders and non-Hodgkin's lymphoma (Scott & Hochberg 1998). Some of these associations are no more than expected based on the person's age. In others, the comorbidities are more likely to occur because of similar underlying disease processes or the presence of common risk factors (for example, the tendency to autoimmunity or excess weight).

Chronic kidney disease

Chronic kidney disease is the long-term loss of kidney function. It contributes substantially to mortality and disability in Australia, especially in the Indigenous population.

A recent biomedical survey found that 11.2% of participants 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). However, it is not possible to determine how many of these people actually had chronic kidney disease (AIHW 2005e). As chronic kidney disease has few specific symptoms, it often remains undetected until the late stages, and many people will not know that they have it. Any self-reported information therefore will underestimate its prevalence.

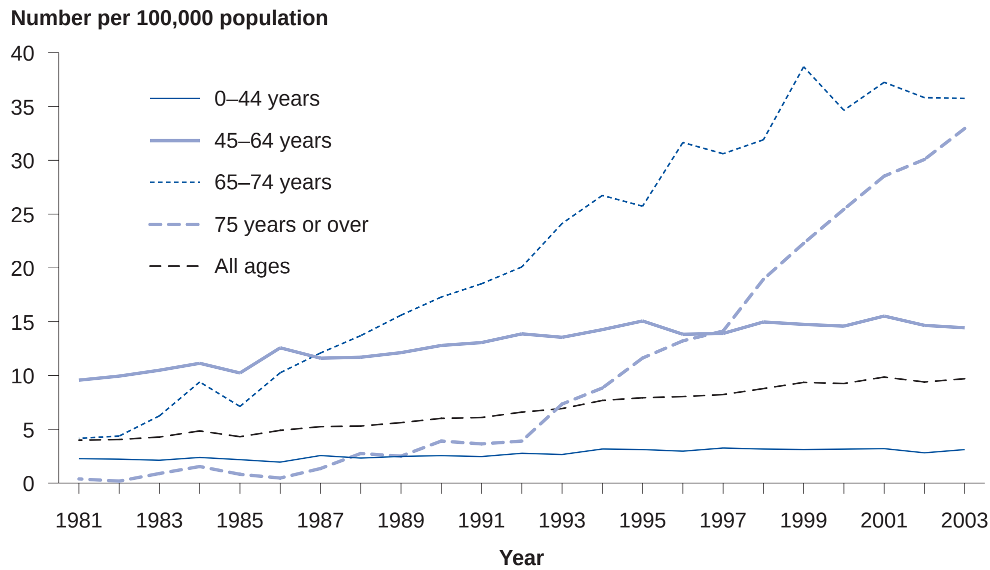
End-stage kidney disease

In severe cases, kidney function may deteriorate to the extent that it is no longer sufficient to sustain life and, if untreated, the person will die within a few weeks. This is called 'end-stage kidney disease' (ESKD). People with ESKD require dialysis or a kidney transplant to survive. Due to the need for this specialised treatment, comprehensive information on people who develop ESKD is available. Data on people receiving treatment for ESKD are compiled by the Australia and New Zealand Dialysis and Transplant Registry.

Incidence and prevalence of treated end-stage kidney disease

In 2004, 1,912 persons (1,150 males and 803 females) began treatment for ESKD in Australia. The number of new patients increased with age, being highest among the 65–84 years age group (36 per 100,000 population). The average age of patients beginning treatment in 2004 was 59.5 years (McDonald et al. 2006), well above the average of 42.3 years in 1981.

Although the number of new patients annually has been rising, this increase has not been seen across all age groups. Under the age of 45 years, incidence rates are relatively stable, but rapid increases have occurred among the older age groups (Figure 2.35). The increasing prevalence of diabetes, reduced cardiovascular mortality and changing policies on accepting older people for treatment are major contributors to this increase.



(a) New cases of kidney replacement therapy.

Source: AIHW 2005e.

Figure 2.35: Trends in the incidence of treated end-stage kidney disease[(a)], 1981 to 2003

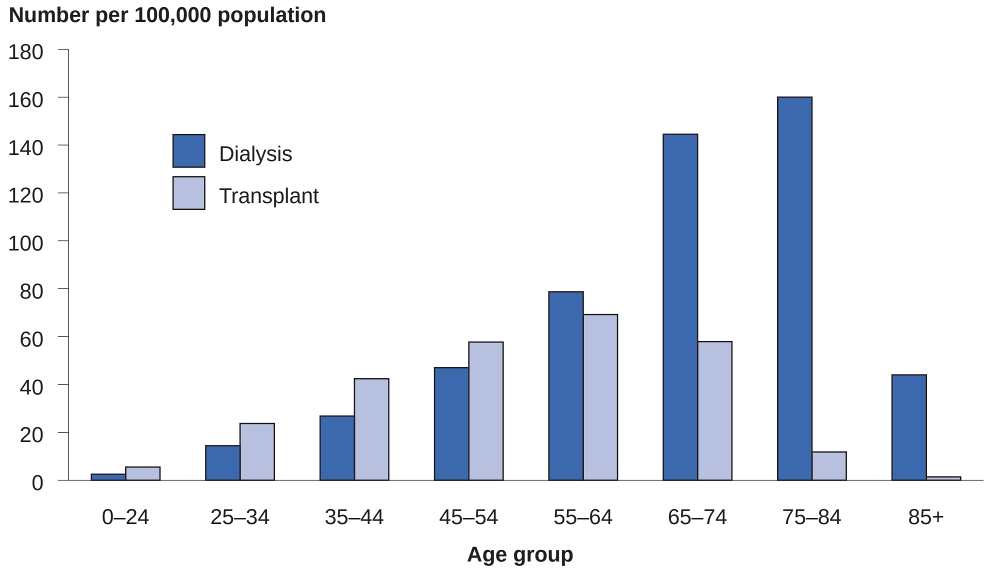
At the end of 2004, 7,952 Australians were undergoing dialysis and a further 6,269 were living with a kidney transplant (McDonald & Excell 2006). The number of functioning transplants was greatest among those aged 55–64 years (69 per 100,000 population), whereas dialysis was most common among those aged 75–84 years (160 per 100,000) (Figure 2.36).

The prevalence of treated ESKD has almost tripled over the past 25 years, from 24 per 100,000 persons in 1981 to 71 per 100,000 in 2004. Although some of this increase may be attributed to a greater incidence of ESKD and increased numbers of new patients beginning treatment, improved management of other illnesses and new technologies are also likely to have contributed to these numbers by increasing patient survival.

Risk factors and causes

A variety of factors may contribute to the development of chronic kidney disease. Diabetes can affect kidney function by damaging blood vessels in the kidneys, a complication known as diabetic nephropathy. Another important cause of kidney damage (especially among younger people) is glomerulonephritis, a group of diseases marked by inflammation of the filtering units (glomeruli) of the kidney. Kidney function may also be reduced through high blood pressure (hypertension), which causes narrowing of blood vessels in the kidneys, impairing the kidneys' filtering ability. Other factors such as smoking, metabolic syndrome, obesity and certain congenital kidney disorders may also increase the risk of chronic kidney disease.

Thirty per cent of patients beginning kidney replacement therapy in 2004 had ESKD due to diabetic nephropathy. Glomerulonephritis was the second most common cause (25%), followed by hypertensive kidney disease (13%) (McDonald et al. 2006).



Source: McDonald et al. 2006.

Figure 2.36: Prevalence of kidney replacement therapy, by age and treatment type, 2004

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 (particularly respiratory infections), and problems with the bones and muscles. Early detection of chronic kidney disease is essential to reduce these effects and prevent or slow further reduction in kidney function. Chronic kidney disease also shares several risk factors with other chronic diseases, including cardiovascular disease and respiratory disease. A person with chronic kidney disease, therefore, may also have one or more other conditions. This can complicate their treatment, increase the need for health services and decrease quality of life.

Management of chronic kidney disease

Management of chronic kidney disease aims to slow or halt further deterioration of kidney function and prevent complications. This may involve the use of medications, regular check-ups and lifestyle modification. 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.

Management in general practice

Chronic kidney disease was managed at a rate of approximately 3 per 1,000 GP encounters in 2003–04. This equates to around 290,000 Medicare-paid GP consultations in that year.

The kidney problem most commonly managed by GPs in the BEACH survey of 2003–04 was described as ‘chronic kidney failure’. Various management strategies for chronic kidney disease were used by GPs. Pathology tests were ordered in most cases, and medications were prescribed or provided in around two-fifths of cases (AIHW 2005e).

Management in hospitals

‘Care involving dialysis’ is the leading cause of hospital separations in Australia, with a total of 762,356 separations (447,534 males and 314,822 females) in 2003–04, 11% of separations in that year. Almost all of these were same-day separations. These high numbers reflect the need for persons undergoing dialysis to receive treatment three to four times per week. Dialysis separation rates are markedly higher among males and in older age groups.

There were 22,568 hospital separations in 2003–04 with the principal diagnosis of chronic kidney disease other than care involving dialysis. In contrast to dialysis, females accounted for 55% of these separations. The average length of stay for chronic kidney disease separations excluding dialysis was 5.3 days for males and 4.9 days for females.

Mortality

Chronic kidney disease was the underlying cause of 2,361 deaths in Australia in 2004 (1.8% of all deaths in that year). Of these, 970 deaths (41%) resulted from chronic kidney failure, 547 (23%) from unspecified kidney failure and 469 (20%) from hypertensive kidney disease. In the majority of cases, one or more additional causes of death were also listed, with the most common being a cardiovascular disease (60% of cases) or a respiratory disease (26%).

Chronic kidney disease is four times as likely to be recorded as an additional cause of death rather than the underlying cause, being listed on death certificates as an additional cause in 9,609 cases in 2004. The most common underlying causes listed in these cases were cardiovascular disease (43% of cases), neoplasm (19%), diabetes (9%) and respiratory disease (8%).

Chronic kidney disease in Indigenous Australians

Aboriginal and Torres Strait Islander peoples are disproportionately affected by chronic kidney disease and particularly by ESKD (Table 2.29). Between 2002 and 2004, around 9% of new patients beginning kidney replacement therapy identified as Aboriginal or Torres Strait Islander, compared with Indigenous representation of 2.4% among the total Australian population.

Hospital use for chronic kidney disease is much more common among Indigenous Australians than among other Australians. In Queensland, Western Australia, South Australia and the Northern Territory (the four jurisdictions where Indigenous identification in hospital records is of acceptable quality), chronic kidney disease was the principal diagnosis in 47% of separations for Indigenous Australians in 2003–04, compared with 11% for other Australians. Separations with the principal diagnosis of dialysis were more than 17 times as likely among Indigenous Australians compared with other Australians in these jurisdictions (Table 2.29).

Chronic kidney disease is also more likely to be recorded on death certificates (as either the underlying or an associated cause) for Aboriginal and Torres Strait Islander people.

In Queensland, Western Australia, South Australia and the Northern Territory (the four jurisdictions with adequate identification of Indigenous status in death registrations), in the period 2002–2004 there were 678 deaths of Indigenous Australians where chronic kidney disease was recorded, around 15% of all Indigenous deaths. In comparison, chronic kidney disease was recorded on the death certificate in around 8% of deaths among other Australians in those jurisdictions during the same period. Indigenous Australians were more than eight times as likely as other Australians to have chronic kidney disease recorded as the underlying cause of death.

Table 2.29: The burden of chronic kidney disease in Indigenous Australians compared with other Australians (number of cases)

	Indigenous Australians	Other Australians	SER[(a)]
Treated end-stage kidney disease			
incidence[(b)]	532	5,265	8.93
prevalence[(c)]	953	13,285	5.41
Hospital separations due to chronic kidney disease[(d)(e)]			
dialysis as principal diagnosis	68,640	246,673	17.18
other CKD as principal diagnosis	1,128	7,720	5.16
Deaths from chronic kidney disease[(b)(d)]			
CKD as underlying cause of death	160	2,386	8.22
CKD as an additional cause of death	518	9,154	6.77

(a) Standardised event ratio, calculated as the ratio of the number of events (ESKD cases, hospital separations or deaths) observed among Indigenous Australians compared to the number that would be expected if Indigenous Australians had the same event rates as other Australians.

(b) Data are for calendar years 2002 to 2004 combined.

(c) Data are for calendar year 2004.

(d) Data are for Queensland, South Australia, Western Australia and the Northern Territory combined. These data may not be representative of those jurisdictions excluded from the analysis.

(e) Data are for financial year 2003–04.

Sources: AIHW analysis of ANZDATA Registry data; AIHW National Hospital Morbidity Database; AIHW National Mortality Database.

Dementia

Dementia is the most significant neurological disorder among persons aged over 80 years. It usually presents as a syndrome, of a chronic or progressive nature, with disturbed memory, thinking, orientation, comprehension, calculation, learning capacity, language and judgment. Consciousness is not clouded. The intellectual impairments are commonly accompanied, and occasionally preceded, by deterioration in emotional control, social behaviour or motivation. Dementia occurs in Alzheimer's disease, some cases of cerebrovascular disease and other conditions affecting the brain.

The burden of disease due to dementia is high. Dementia is a large contributor to the cost of care, although people's needs may vary greatly with the severity of impairment. People with dementia eventually become dependent on their care providers in most or all areas of daily living.

Because Australia's population is ageing, there has been growing recognition that dementia represents a significant challenge to health, aged care and social policy. In 2005 the Australian

Government announced the 'Helping Australians with dementia, and their carers—making dementia a National Health Priority' initiative to support new care programs for people with dementia, dementia-specific training for care workers and additional research.

Further information about dementia in older Australians is presented in Chapter 4.

2.7 Mental health problems and illnesses

Mental health problems and illnesses include short-term anxiety and depression as well as longer term conditions such as anxiety disorders, chronic depression and schizophrenia.

Mental ill health is one of the leading causes of non-fatal burden of disease and injury in Australia. It is estimated to account for 13% of the disease burden in Australia in 2003, 2% of years of life lost due to premature mortality (YLL) and 22% of years of 'healthy' life lost due to poor health or disability (YLD) (AIHW: Begg et al. in press). (The DALY (including YLL and YLD) estimates were provisional at the time of writing.) Mental problems are also associated with increased exposure to health risk factors, poorer physical health, and higher rates of death from many causes, including suicide.

In view of its impact on the health of the Australian population and the possible reduction in disease burden with prevention and treatment, mental health has been declared a National Health Priority Area.

Prevalence

The prevalence of mental illness in adults has been estimated using a variety of different measures. A computerised version of the Composite International Diagnostic Interview was used to identify mental illness in the adult component of the National Survey of Mental Health and Wellbeing (NSMHW), conducted in 1997 by the ABS. Estimates of the prevalence of mental and behavioural problems arising from the NHS were based on self-reports of illness, and on reports of the use of medications for mental wellbeing.

A person may reveal in other ways that they have psychological distress, without necessarily having been diagnosed or treated for a mental illness. In the 1997 NSMHW, the 2001 and 2004–05 NHS and the 2004 National Drug Strategy Household Survey, levels of distress were assessed using the Kessler 10 scale of psychological distress. The extent of mental illness in the population can also be estimated using measures of psychiatric disability (see below).

The 1997 NSMHW is the source of the most commonly quoted estimate of the prevalence of mental illness—that one in five Australian adults will experience a mental illness at some time in their life. Overall, an estimated 18% of Australian adults had experienced a mental illness in the preceding 12 months (ABS 1998). The prevalence decreased with age, with the highest prevalence being among those aged 18–24 years (27%), reflecting a relatively high rate of substance use disorders. The prevalence was lowest, at 6%, for those aged 65 years or over.

The 2004–05 NHS provides the latest estimates of the prevalence of mental health conditions in Australia (ABS 2006b). About 1 in 10 (equivalent to 2.1 million Australians) reported a long-term mental or behavioural problem. The prevalence was 6.7% (1 in 15) for children aged under 15 years, 9.4% for those aged 15–17 years, 12.3% for those aged

18–64 years and 9.5% for persons aged 65 years or over. Anxiety-related problems and mood (affective) problems were the most commonly reported conditions (each affecting approximately 5% of the population). More females (6%) than males (4%) reported each of these conditions. These prevalence estimates are considered to be less reliable than prevalence estimates for other conditions derived from the 2004–05 NHS, because responses could be based on self-diagnosis rather than diagnosis by a health professional. For other National Health Priority Area conditions, respondents were asked to report whether a diagnosis had been made by a health professional (ABS 2006b).

About 19% of respondents aged 18 years or over (equivalent to 2.9 million Australians) reported the use of medication for mental wellbeing in the 2004–05 NHS (ABS 2006b). Use was more common among females (23.9%) than males (14.3%), and was most common in respondents aged 65 years or over (24.1%). Use of antidepressants was reported by 5.2% of respondents and 4.5% reported use of sleeping tablets or capsules.

Psychological distress

Table 2.30 shows trends in the proportion of adults with very high psychological distress scores. In 1997, an estimated 2.2% of Australians aged 18 years or over reported these levels of distress. The estimated proportion increased to 3.8% in 2004–05.

In 1997 and 2001, the highest rates of very high levels of psychological distress were reported in the age group 45–54 years by both sexes. In 2004–05, this applied to the age groups 55–64 years for males and 45–54 years for females. The distribution of very high psychological distress score in the 2004 NDSHS was, however, much different.

Table 2.30: Proportion of adults with very high psychological distress scores, 1997–2004 (per cent)

	Age group						
Year	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65 or over**	**Total**
				Males			
1997	[(a)]0.6	[(a)]1.3	2.2	3.0	2.7	[(a)]1.9	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	[(a)]2.1	2.8	2.4	3.8	[(a)]1.5	[(a)]1.3	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) Estimate has a relative standard error of between 25% and 50% and should be used with caution.

Note: Persons with scores of 30 to 50 are rated as having very high level of psychological distress on the Kessler 10 scale of psychological distress.

Sources: ABS 1998, 2002, 2006b; AIHW 2005f.

According to the 2004–05 NHS, very high levels of psychological distress were more common in females (Table 2.31). Males (66.6%) were more likely to report low levels of psychological distress than females (59.1%). Adults reporting a long-term mental or behavioural problem were more likely to have high or very high levels of psychological distress than the total adult population (48% compared with 13%) (ABS 2006b).

Psychiatric disability

The prevalence of psychiatric disabling conditions was estimated at 5.2% of the Australian population in 2003, around 1.0 million people, based on the ABS Survey of Disability, Ageing and Carers.

Table 2.31: Prevalence of psychological distress, 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 2006b.

Almost half (48.4%) of the people with a psychiatric disability had severe or profound core activity limitation—that is, they sometimes or always needed help with self-care, mobility or communication (Table 2.32). 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 in whom psychiatric disability was reported as the main or another disabling condition, 36.7% also reported 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.

As at June 2004, of the total number of recipients of the Australian Government's Disability Support Pension, 25.4% had a psychiatric/psychological condition

(Australian Government 2005). This was the second largest recipient group, following those with musculoskeletal and connective tissue conditions (34.0%).

Table 2.32: 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.

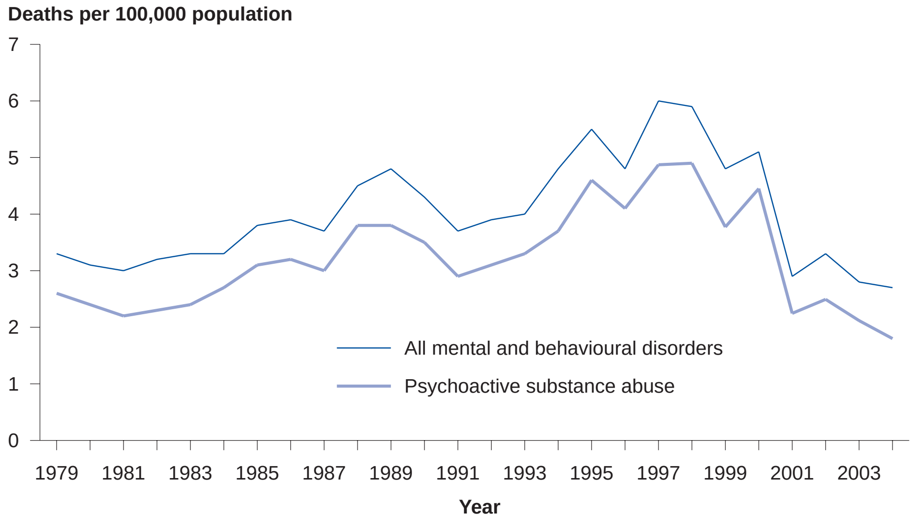
(b) Includes persons with no core activity limitation but who are restricted in schooling or employment only, and persons without specific limitations or restrictions.

Note: Equals the percentage of the respective Australian population.

Source: AIHW 2005g.

Mortality

A mental or behavioural disorder was recorded as the underlying cause for 574 deaths in 2004. The age-standardised rate was 2.7 per 100,000 persons, down from the peak years of 1994–1996 (Figure 2.37). Most of the deaths with a mental or behavioural disorder as the underlying cause of death were due to abuse of psychoactive substances such as alcohol and heroin. These 574 deaths do not include suicides, reported separately in Section 2.9.



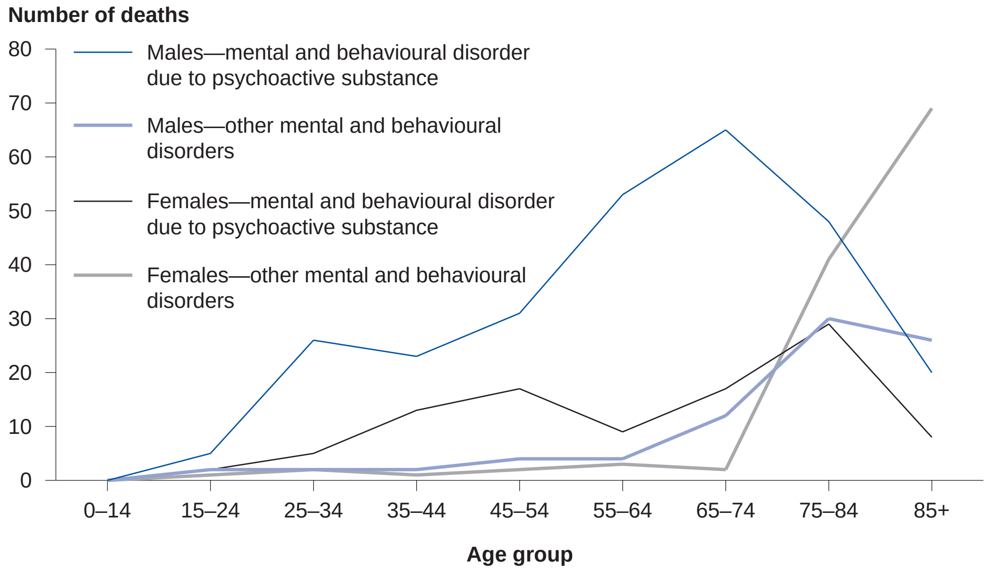
Notes

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.

Source: AIHW National Mortality Database.

Figure 2.37: Death rates for mental and behavioural disorders, 1979 to 2004

Deaths attributed to mental and behavioural disorders due to psychoactive substance abuse were more common among males than females (Figure 2.38). 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 2.38: Deaths from mental and behavioural disorders, by sex and age group, 2004

Comorbidity

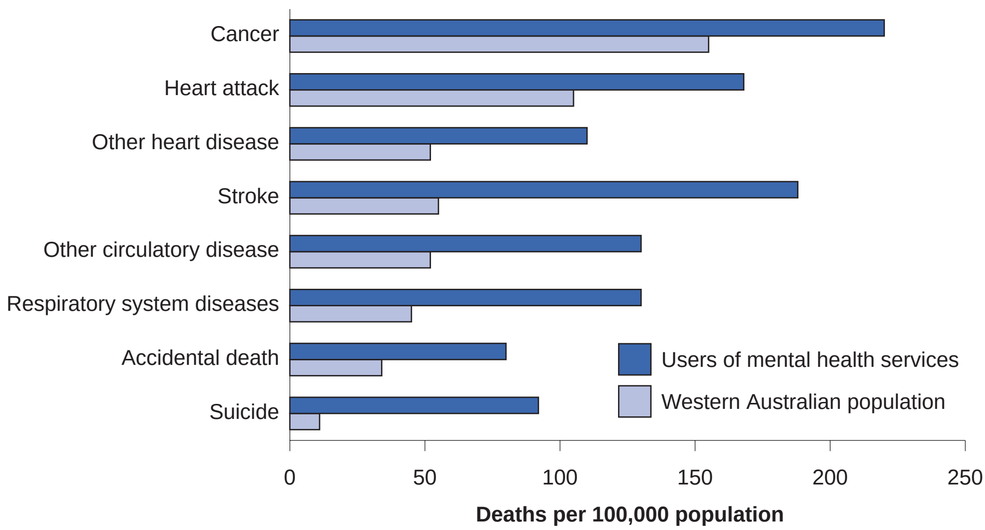
Comorbidity, involving more than one mental illness, or at least one mental illness and one or more physical illnesses, is common among persons with mental illness. In the NSMHW, about one in four persons with an anxiety, affective or substance use disorder also had at least one other mental illness (Hall et al. 2001). Among those with psychotic disorders, 30% had a medical history of alcohol abuse or dependence, 25.1% of cannabis abuse and 13.2% of other substance abuse or dependence (Jablensky et al. 1999).

In the 2004–05 NHS, the prevalence of other National Health Priority Area diseases and conditions was higher among persons reporting a long-term mental or behavioural problem than among the population in total (ABS 2006b). Arthritis was reported by 23.4% of persons reporting a long-term mental or behavioural problem, compared with 14.9% of the total population. For asthma, the rates were 16.0% and 10.2%, respectively; for heart, stroke and vascular diseases (as defined by ABS) they were 6.3% and 3.8%. Among persons with long-term mental and behavioural problems, arthritis was most common in the 45–64 years age group (38%) while asthma was most common in the 25–44 years age group (15.4%).

A study reviewing the health experience of over 240,000 persons who used mental health services in Western Australia from 1966–1998 (equivalent to 8% of the Western Australian population) found that during 1980–1998 their death rate was 2.5 times the rate of the general population (Lawrence et al. 2001). Almost half the suicides in Western Australia were by people who had used mental health services, with rates seven times those of the general population. The greatest number of excess deaths for people who had used mental health services were from cardiovascular disease (Figure 2.39).

Further, 44% of hepatitis C cases and 19% of HIV cases in Western Australia over this period occurred in users of mental health services. Persons with psychoses and alcohol and drug disorders were most at risk of infectious diseases. Those with mental illness had higher rates of digestive system disorders linked to alcohol abuse, and higher rates of respiratory disorders linked to smoking. They had a higher risk of all types of injuries, especially drug-related poisonings and injuries inflicted by other people.

The Western Australian study also noted that people with mental illness have high rates of physical illness related to behavioural and lifestyle risk factors, including smoking, alcohol and drug abuse, obesity and poor diet. These physical illnesses often go undiagnosed, leading to lower hospital admission rates but higher unnecessary deaths.



Source: Lawrence et al. 2001.

Figure 2.39: Death rates for users of mental health services, Western Australia, 1980–1998

Use of health services

Hospital separations

People with mental and behavioural problems are more likely to be hospitalised than those without these problems. According to the 2001 NHS, the proportion of people with mental or behavioural problems admitted to hospital in the two weeks before the survey was nearly twice that of people without such problems (19.1% compared with 11.5%). Those with very high levels of psychological distress (28.9%) were also more than twice as likely to be admitted to hospital than those with low levels (11.7%).

There were 309,293 hospital separations with either a mental health-related principal diagnosis or a record of specialised psychiatric care in 2003–04, or 1,540 separations per 100,000 persons. These separations accounted for 2,849,024 patient days, which equates to an average stay of 9.2 days per episode of separation (Table 2.33). Although comprising 4.5% of all hospital separations, mental health-related separations accounted for 12.1% of total patient days.

Table 2.33: Mental health-related hospital separations[(a)], 2003–04 (number)

Principal diagnosis	Separations	Patient days
Dementia	6,618	177,528
Other organic mental disorders	5,083	83,755
Mental and behavioural disorders due to use of alcohol	33,427	142,710
Mental and behavioural disorders due to other psychoactive substances use	14,471	84,253
Schizophrenia	30,217	643,994
Other schizophrenic, schizotypal, delusional disorders	19,991	249,303
Manic episode	1,232	12,599
Bipolar affective disorders	17,904	211,663
Depressive disorders	80,112	481,912
Other mood (affective) disorders	4,092	21,038
Neurotic, stress-related and somatoform disorders	49,975	209,919
Eating disorders	5,652	49,189
Other behavioural syndromes associated with physiological disturbances and physical factors	1,559	9,780
Disorders of adult personality and behaviour	9,655	51,673
Mental retardation	421	32,325
Disorders of psychological development	1,169	5,439
Behavioural and emotional disorders with onset usually occurring in childhood and adolescence	5,015	16,140
Mental disorder not otherwise specified	440	7,253
Other mental health-related diagnosis[(b)]	15,767	128,182
Other[(c)]	6,493	221,025
Total	**309,293**	**2,849,024**

(a) Includes separations 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 2003b.

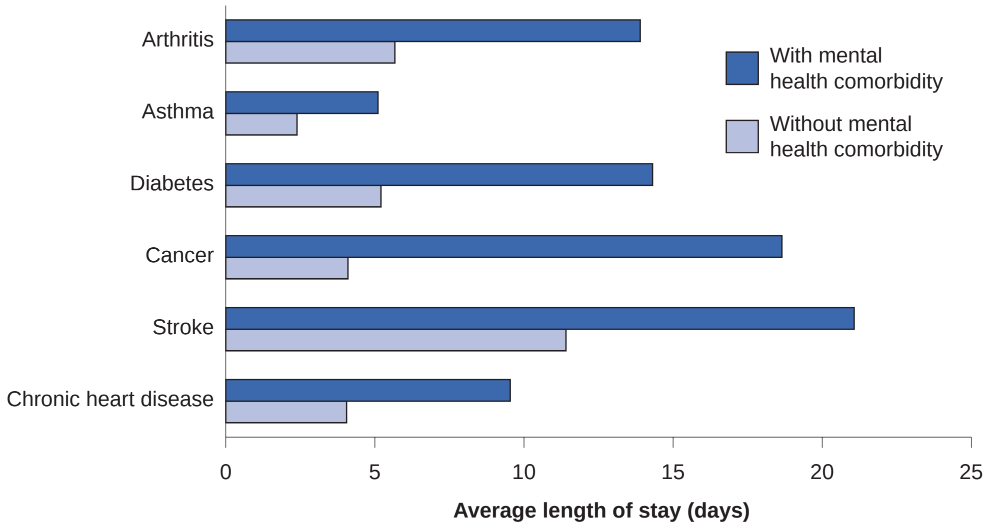
(c) Includes separations for which specialised psychiatric care was provided without a mental health-related principal diagnosis being recorded.

Source: AIHW National Hospital Morbidity Database.

Principal diagnoses of depressive disorders (25.9%), neurotic and stress-related disorders (16.2%), mental and behavioural disorders due to alcohol (10.8%), and schizophrenia (9.8%) accounted for large proportions of mental health-related separations. Schizophrenia accounted for the largest proportion of patient days (23.4%).

In 2003–04, there were a further 273,833 hospital separations for which a mental health-related diagnosis was reported as an additional diagnosis with a non-mental health principal diagnosis. These separations accounted for 2,862,167 patient days.

The average length of stay in hospital for patients with a National Health Priority Area principal diagnosis was higher when the patient also had a mental health diagnosis reported (Figure 2.40).



Source: National Hospital Morbidity Database 2003–04.

Figure 2.40: Mental health problems as comorbidity in hospital separations, 2003–04

GP visits

The proportion of 2001 NHS (ABS 2004c) respondents with mental and behavioural problems who reported consulting a GP in the two weeks before the survey was higher (33.3%) than those without such problems (20.5%). The proportion was also much higher among those with very high levels of psychological distress (48.0%) than those with low levels of distress (20.1%).

According to estimates from the 2004–05 BEACH survey of general practice activity, 10.8% of GP attendances (about 10.4 million) involved the management of at least one mental health-related problem (AIHW: Britt et al. 2005). Depression was the fourth most commonly managed problem in general practice (3.7 per 100 encounters). Medications relating to the nervous system were the most commonly prescribed drug type. These included antidepressants, anxiolytics and antipsychotics.

2.8 Communicable diseases

Illness, fever or rash due to infectious agents or their toxic products is commonly referred to as a communicable disease. Strictly speaking, the term communicable diseases applies to those diseases that can be transmitted from one person to another, but in practice the term is usually applied to all infectious conditions.

Generally acute in nature, communicable diseases are large causes of morbidity, disability and mortality in many parts of the world. In Australia and similar developed countries, they are presently not major contributors to the burden of disease. However, the potential of serious outbreaks continues to present a challenge in public health, and requires planning and constant vigilance.

The range of infectious agents causing communicable diseases is large and biologically diverse. **Bacteria** cause communicable diseases such as pertussis (whooping cough), typhoid and tuberculosis; **viruses** cause diseases such as measles, influenza and AIDS; **fungi** are responsible for conditions such as tinea; **protozoan parasites** cause a variety of diseases including malaria; and **bacterial toxins** are responsible for some forms of food poisoning. Infestations of parasites such as head lice as well as diseases that are spread through infectious protein particles or prions are also regarded as communicable diseases.

While most of the communicable diseases are acute but usually managed by a person's immune system or medical treatment, some can become chronic. Examples are hepatitis B and C with their frequent long-term effects on the liver, *Helicobacter pylori* infection causing peptic ulcer, and the human papilloma virus that can lead to cervical cancer.

Much of the morbidity and illness associated with communicable diseases is controllable through sanitation, other public health measures and the use of antibiotics. Vaccination is a highly successful intervention measure used globally against a variety of communicable diseases. It has led to striking reductions in the occurrence of numerous communicable diseases in Australia and worldwide.

Despite these advances in public health and medicine, communicable diseases remain a major threat to human health. New diseases continue to emerge, and people are increasingly living into old age, where they are more likely to be susceptible to these diseases.

This section provides an overview of the burden of disease (morbidity, disability and mortality) associated with communicable diseases in Australia, including those diseases that continue to have an impact despite being prevented by vaccines. There is also a discussion on emerging infectious diseases such as bird flu (avian influenza).

Changing burden of communicable diseases

Communicable diseases have been a large source of mortality throughout human history and still account for much premature mortality in the developing world. However, their overall incidence and associated mortality have declined considerably over the last century (WHO 2005a).

In Australia, communicable diseases now account for about 4% of deaths annually whereas in the early 20th century they claimed around 20%. Despite this fall, communicable diseases are still sources of illness and health care use and a considerable proportion of visits to GPs are for communicable diseases (AIHW: Britt et al. 2005). Several acute and opportunistic infections also require care in hospitals. In 2001–02, direct health expenditure for these diseases exceeded $1.2 billion in Australia (AIHW 2004b). These costs are in addition to the money spent on vaccination and other public health activities.

Some communicable diseases become chronic in nature, often leading to long-term conditions and disability. From self-reports in the 2004–05 NHS, almost 1% of Australians had an infectious or parasitic disease long-term—that is, for six months or more (ABS 2006b). Infectious and parasitic conditions are estimated to have been responsible for chronic disability in almost 20,000 persons in 2003 (ABS 2004b).

Infectious and parasitic diseases accounted for 1.3% (provisional at the time of writing) of total years of life lived with disability or YLD (see also Section 2.10) by Australians in 2003 (AIHW: Begg et al. in press). This was in addition to YLD attributed to acute respiratory infections (as distinct from the categories of infectious and parasitic diseases). Infectious diseases also contribute to a proportion of YLD attributed to diseases of the genitourinary system, as well as those of the digestive system.

The overall burden of disease for communicable diseases approximated 1.7% (provisional at the time of writing) of total DALYs in 2003 (AIHW: Begg et al. in press). Much of this burden was due to premature mortality (years of life lost, or YLL).

Measuring the status of communicable diseases

The status of communicable diseases in a population may be assessed using a variety of measures. These include their prevalence, transmission rates, persistence and latency of infection, recovery rates, herd immunity, disease severity, and survival. Most of these parameters cannot be measured directly and indicators such as disease notifications, GP visits, hospital separations and cause of death are therefore used to monitor the status of communicable diseases. Also, many communicable diseases are managed mostly by the host's immune system, and therefore they may not be picked up by the routine health care data.

Notifications of major communicable diseases in Australia are compiled by the National Notifiable Diseases Surveillance System (NNDSS) (see Box 2.8). This system collects information on 63 diseases and conditions. This information is complemented from other surveillance systems, including for several diseases that are not covered by the NNDSS data.

Another common indicator of the status of communicable diseases is the vaccination rate, which serves as a guide to the level of 'immunity' in the population. Immunisation has been shown to be among the most cost-effective strategies for preventing communicable diseases; therefore, the proportion of population vaccinated is a good indicator of disease control. (See Chapter 3 and Chapter 7 for further information on this issue.) A related indicator is the number of people contracting vaccine-preventable diseases regardless of their vaccination status.

A further useful source of information for communicable diseases is mortality data. Although communicable diseases have declined as a major cause of death in Australia, they do contribute to a large number of deaths indirectly. Information gleaned from both the underlying and associated causes of death helps in gauging the overall mortality impact of communicable diseases.

Disease notifications

There were 110,929 notifications of communicable diseases to the NNDSS in 2004. This is over three times the number when the NNDSS began in 1990, but much of the increase is due to an expansion in the list of notifiable diseases. The most commonly notified infections in 2004 were hepatitis C, pertussis, salmonellosis and hepatitis B. Bacterial infections such as legionellosis, leprosy, meningococcal infection and tuberculosis were also reported (Table 2.34).

Table 2.34: Comparisons of maximum and 2004 NNDSS notifications of selected diseases

Infection	Maximum (NNDSS year)	NNDSS (2004)	Reduction (per cent)
Hepatitis C (unspecified)	20,105 (1999)	13,028	35
Pertussis	10,749 (1997)	8,557	20
Salmonellosis	7,696 (2002)	7,607	1
Hepatitis B (unspecified and incident)	8,448 (2001)	6,136	27
Cryptosporidiosis	3,265 (2002)	1,573	52
Tuberculosis	1,253 (1997)	1,076	14
Meningococcal infection	686 (2001)	408	41
Hepatitis A	3,031 (1997)	315	90
Measles	4,792 (1994)	45	99
Rubella	5,571 (1995)	33	99
Haemophilus influenzae type b (Hib)	502 (1992)	15	97

Notes

1. Maximum (NNDSS year) denotes maximum number of notifications since the establishment of the NNDSS, by year.
2. NNDSS (2004) denotes the latest count.
3. Reduction is calculated as per cent decrease from maximum number to number of notifications in 2004.

Source: Yohannes et al. 2006.

Notifications have fallen for several diseases, in particular vaccine-preventable diseases, since the NNDSS began. Those conditions with the largest proportional declines in numbers were hepatitis A, measles, rubella and *Haemophilus influenzae* type b (Hib), although hepatitis C has had the largest decrease in actual numbers (Table 2.34).

General practice visits

GPs are usually the first contact with the health system for people with communicable diseases, and the BEACH survey indicates that infections and immunisations make up around 7% of all GP encounters (AIHW: Britt et al. 2005). Upper respiratory tract infections (URTI) and immunisation/vaccination are, respectively, the second and third most frequently managed problems by GPs. Other viral diseases, gastrointestinal infections and urinary tract infections make up a further 2.7% of GP encounters.

A characteristic feature of communicable disease-related GP visits is that many of them are new problems for the patient. Compared to 38% of all GP visits being for new problems, the proportion of new problems exceeds 70% for communicable diseases.

Box 2.8: Disease notification in Australia

A disease may be made notifiable to jurisdictional health authorities depending on its significance to public health. Surveillance of communicable diseases varies between jurisdictions, as each state or territory has specific requirements under its public health legislation for notification by medical practitioners, laboratories and hospitals. The notifiable diseases and the case definitions may also vary between jurisdictions.

Information on 63 nationally notifiable communicable diseases is provided by states and territories using a standard national surveillance case definition to the National Notifiable Diseases Surveillance System (NNDSS).

Newly diagnosed HIV infection and AIDS are notifiable conditions in every state and territory. The National Centre in HIV Epidemiology and Clinical Research (NCHECR) compiles information on HIV/AIDS notifications.

Hospitalisation

Communicable diseases are one of the major reasons for hospital care. In 2003–04, pneumonia was the third largest principal diagnosis for overnight hospitalisation in public hospitals in Australia, accounting for 2% of all separations. Other common communicable disease diagnoses in overnight hospital separations were gastrointestinal infections and urinary tract infections, which accounted for a further 1.7%.

Despite the efficacy and coverage of vaccination, there were 16,141 hospital separations for vaccine-preventable diseases in 2003–04. In line with downward trends in notifications, however, the rate of hospital separations for these diseases is declining. Between 1999–00 and 2003–04, the rate of separations for vaccine-preventable diseases declined by an average of 4.1% annually (AIHW 2005a).

Mortality

Apart from pneumonia, infectious and parasitic diseases are no longer major causes of mortality in Australia. Deaths from diphtheria, tetanus, polio, typhoid and tuberculosis are rare. Infectious and parasitic diseases are now listed more often as a contributing cause of death rather than as the underlying cause (see Section 2.5 for description of these terms). Influenza and pneumonia, however, continue to be major underlying causes of death among the elderly.

Communicable diseases were listed as the underlying cause of 5,188 deaths in 2004. That represents around 4.0% of all deaths in Australia, with an age-standardised death rate of 24 per 100,000 persons. Most of the deaths occurred in older age groups, reaching a high of 817 per 100,000 among those aged 85 years or over. Nearly 80% of these deaths were from pneumonia.

The number of deaths attributed to all communicable diseases has risen steadily since the low of 1986, when they were the underlying cause in 2,130 deaths. The number has more than doubled in less than two decades. One of the major reasons for this upward trend is automated coding since 1996, which assigns pneumonia as the underlying cause of death more often than previously, rather than as a contributing cause of death.

Specific disease profiles

Statistical profiles of several communicable diseases are included in this section. Given the large number of communicable diseases, the profiles have been compiled by 'mode of transmission'. Prominent groups covered are acute respiratory infections, bloodborne diseases, sexually transmitted infections, gastrointestinal diseases, vectorborne diseases, other bacterial infections and prion diseases.

Acute respiratory infections

Acute respiratory infections, or ARIs, include upper and lower respiratory tract infections, influenza and pneumonia, and are a major cause of acute illness, hospitalisation and mortality. Several different types of infectious agents cause ARI, notably influenza viruses, *Streptococcus pneumoniae* and respiratory syncytial virus (RSV). People with chronic diseases, children, the elderly and Indigenous Australians are at an increased risk for these infections.

Respiratory infections are one of the most commonly managed problems in general practice, with upper respiratory tract infections (URTIs) accounting for 3.8% of all problems managed by GPs (AIHW: Britt et al. 2005). This high rate of GP consultation is mainly due to influenza-like illness, which annually affects between 10% and 20% of the general population (ABS 2006b). URTIs were the second most frequently managed problem (5.6 URTI cases per 100 GP encounters in 2004–2005) after high blood pressure, but the most frequently managed new problem in GP care. Over 77% of the URTI consultations were for new episodes.

A total of 133,966 hospital separations in 2003–04 had ARI listed as the principal diagnosis. About a third of these (43,346 separations) were of children aged 0–4 years. Those aged 50 years or over were also over-represented, accounting for close to 30% of all ARI-related separations. While most of the adult ARI separations were due to pneumonia and influenza, respiratory infections such as RSV and parainfluenza were additional large causes for hospital separations among children.

ARIs were the underlying cause of 3,498 deaths (1,549 males; 1,949 females) in 2004, making them the leading cause of death from infectious diseases. Most of the ARI deaths are concentrated in older age groups, with an average age at death of 80 years for males and 85 years for females in 2004.

The vast majority (97.0%) of ARI deaths were due to influenza and pneumonia. The age-standardised rate for influenza and pneumonia was 15.7 per 100,000 persons—the 11th most common cause of death among males in 2004 and the 9th most common cause of death among females (Table 2.19).

Trends in pneumonia hospitalisation and mortality

Pneumonia is one of the more common principal diagnoses for hospital separations in Australia, and one of the 10 leading causes of death. Its status as a cause of morbidity and mortality has changed considerably over the last several decades. At the turn of the

20th century, pneumonia was a major cause of mortality, and the problem was particularly serious in children and in old people. However, this has changed considerably, and pneumonia as a cause of illness and mortality in children has receded. Most of the cases of pneumonia now occur among the elderly.

Table 2.35: Trends in hospital separation and death rates for influenza and pneumonia, 1997 to 2004

	Hospital separation rates			Death rates	
Year	Influenza	Pneumonia	Year	Influenza	Pneumonia
			1997	1.3	12.4
1997–98	21.2	354.3	1998	0.7	11.2
1998–99	15.5	338.9	1999	0.4	10.3
1999–00	13.6	319.9	2000	0.4	15.4
2000–01	12.4	305.9	2001	0.2	13.8
2001–02	9.4	311.7	2002	0.3	15.0
2002–03	11.3	321.9	2003	0.3	16.8
2003–04	13.8	324.8	2004	0.2	15.6

Note: Both death rates and hospital separation rates, given as per 100,000 population, are age-standardised to the Australian population as at 30 June 2001.

Sources: AIHW National Mortality Database; AIHW National Hospital Morbidity Database.

In 2003–04, there were 53,629 overnight hospital separations for pneumonia, at a rate of 325 per 100,000 persons. There were also many other cases where pneumonia was listed as an additional diagnosis. The rate of hospital separations, while fluctuating from year to year, has stayed at a little above the 300 per 100,000 mark since 1997–98 (Table 2.35).

The rate of deaths due to pneumonia declined considerably, by almost half during 1970–1986, and then plateaued for a decade. Most of these deaths now occur among persons aged 85 years or over. Since 2000, however, there has been an increase in pneumonia deaths (Figure 2.41), partly due to changes to the automated coding of cause of death as discussed earlier.

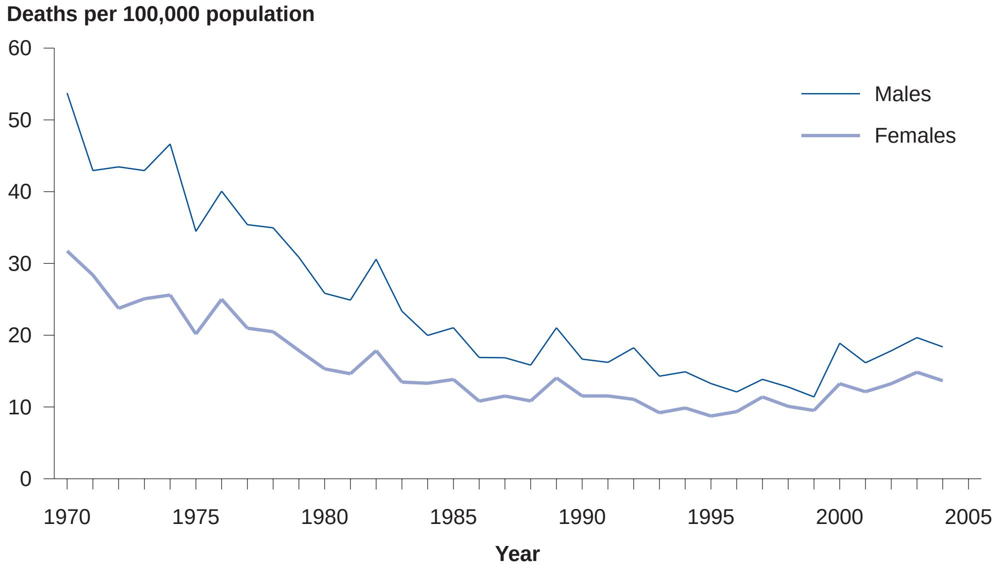
Bloodborne diseases

Bloodborne diseases are caused by infections spread via blood, blood products and bodily fluids. There are many modes of their transmission, including blood contact and sexual contact. These diseases include HIV/AIDS and viral hepatitis.

HIV/AIDS

Acquired immune deficiency syndrome (AIDS) is caused by a retrovirus, the human immunodeficiency virus (HIV). Through the destruction of key cells of the immune system, HIV can reduce human immune function such that relatively minor infections become deadly. An estimated 14,840 people were living with HIV/AIDS in Australia in 2004. Often persons with HIV can be clinically healthy, especially with the latest treatments, and have not necessarily progressed to the symptomatic stage of AIDS.

New diagnoses of HIV infection in Australia declined from 890 in 1995 to 660 in 2000, and then increased to around 820 in 2004. Reported diagnoses of newly acquired HIV infection increased from 151 in 1998 to 281 cases in 2003 and then declined to 253 cases in 2004.



Note: Age-standardised to the Australian population as at 30 June 2001.
Source: AIHW National GRIM Books.

Figure 2.41: Trends in pneumonia mortality, 1970 to 2004

The vast majority of new HIV diagnoses were among males with a history of homosexual contact; relatively small numbers were attributed to injecting drug use or heterosexual contact. HIV prevalence remained below 1% among those attending needle and syringe programs, people entering prison and individuals with a history of heterosexual contact only (NCHECR 2005).

A total of 9,618 AIDS cases had been notified in Australia by 31 December 2004, since statistics began in 1981 (NCHECR 2005). Almost 95% of persons with the syndrome were males, with a median age of 38 years at the time of notification.

Survival following the progression to AIDS is low. In cases diagnosed before 1996, average survival was 17 months, but this has increased to 45 months for cases diagnosed since 2001. The availability of antiretroviral treatment has contributed to improved survival. An estimated 53% of people with HIV/AIDS were receiving antiretroviral treatment in 2004.

The total number of AIDS deaths, up to 2004, has been estimated to be 6,590. More than two-thirds of these deaths occurred before 1995. The annual number of AIDS deaths has declined considerably in the last decade, from 516 in 1996 to 116 in 2004 (NCHECR 2005).

Viral hepatitis

Viral hepatitis (inflammation of the liver due to viral infection) is caused by a variety of viruses. Five different types affect humans: A, B, C, D and E. Types B, C and D are bloodborne (Clarke 2004).

The hepatitis B virus is well known for causing chronic infection. Infection with hepatitis B over time may lead to cirrhosis of the liver and liver cancer. The risk of chronic infection is greatest in those infected as infants, particularly if infected in the perinatal period. Vaccination is available against hepatitis B and has been recommended for use in newborns since 2000.

A total of 275 cases of newly acquired hepatitis B infection were diagnosed in Australia in 2004, at an annual incidence rate of 1.4 per 100,000 persons. Since the infection is often asymptomatic and severe acute inflammation is rare, not all cases of hepatitis B infection are identified.

Hepatitis C has become an important disease in recent years due to its chronicity, and as many as 50% of cases progress towards chronic liver disease. An estimated 259,570 people were living with hepatitis C in Australia in 2004, with around 13,028 new cases diagnosed that year. The high numbers of newly acquired hepatitis C cases indicate continuing wide viral transmission. The main mode of transmission is through injecting drugs.

Hepatitis C was the underlying cause of 21 deaths (11 males and 10 females) in 2004. It was also the primary cause of 41 cases of liver transplant that year. It has been estimated that only 1% of persons infected with hepatitis C virus were receiving antiviral treatment in 2002 (NCHECR 2005).

Sexually transmitted infections

A major mode of transmitting infectious diseases is sexual contact. Data on sexually transmitted infections (STIs) are collected by the NNDSS, covering chlamydia, donovanosis, gonococcal infection and syphilis. Infections with HIV and hepatitis, described earlier, can also be sexually transmitted.

There were 46,762 STI notifications in Australia in 2004, more than three times the number in 1997 (15,335). Several reasons are advanced for this recent increase in STI notifications, including increases in screening rates, the use of more sensitive diagnostic tests, as well as periodic public awareness campaigns leading to greater awareness of the conditions (Miller et al. 2005).

Chlamydia was the most frequently reported infection, followed by gonococcal infection. Australia had 35,189 notifications of chlamydia in 2004—an increase of 14% over the previous year. There has also been an associated increase in the number of diagnostic tests for *Chlamydia trachomatis*.

A total of 7,098 cases of gonococcal infection were notified in 2004, the highest number since 1991.

The notification of syphilis includes both new infections and newly diagnosed cases that may not be new infections. The number of syphilis cases notified in 2004 was 2,296, and the rate was considerably higher among males.

Gastrointestinal diseases

Many gastrointestinal communicable diseases and foodborne diseases are notifiable in Australia. OzFoodNet, a collaborative effort of the Australian states and territories, undertakes enhanced surveillance of foodborne diseases across Australia.

There were 25,247 notifications of potentially foodborne diseases in 2004, an increase of 2% on the total in 2003 (Yohannes et al. 2006). However, it is widely recognised that the notified cases are a small fraction of all gastrointestinal infections in the community.

The majority of gastrointestinal notifications were for campylobacteriosis (15,008) and salmonellosis (7,607). Campylobacteriosis (in all states and territories except New South Wales) was notified at a rate of 75 cases per 100,000 persons and for salmonella infections the rate was 38 cases per 100,000. Rates were similar to those reported in 2002.

Attributing the mode of gastrointestinal infection to specific sources is difficult. People may contract these infections via food, water, other people, the environment or animals. Food transmission alone is estimated to account for considerable numbers of cases of gastroenteritis each year in Australia (Veitch & Hogg 1997).

Vectorborne diseases

In addition to the human host, vectorborne diseases require another organism, such as a mosquito, to transmit the infectious agents. Malaria, dengue, yellow fever, filariasis, Ross River virus disease and encephalitis are some of the worldwide examples of these diseases. Globally, dengue and malaria are responsible for much human illness and death. However, the transmission of these diseases in Australia is low or absent, and most reported cases of dengue and all cases of malaria are acquired overseas.

There is a constant threat of transmission in Australia of vectorborne diseases. The NNDSS covers a variety of these diseases, caused by alpha viruses (Barmah Forest virus disease and Ross River virus disease), flaviviruses (dengue, Murray Valley encephalitis virus, Japanese encephalitis virus and Kunjin virus disease) and protozoans.

Ross River virus: Infection with this virus is the most commonly notified vectorborne disease in Australia (Table 2.36), with 4,000 notifications in 2004. Ross River virus infections show a seasonal pattern, with peak notifications in the first two quarters of every year. Notification rates are highest in the Northern Territory.

Table 2.36: Vectorborne disease notifications, 2004

	Notifications	
Disease/infection	Number	Rate[(a)]
Ross River virus	4,000	19.9
Barmah Forest virus	1,052	5.2
Dengue fever	326	1.6
Malaria	559	2.8

(a) Notification rate per 100,000 population.

Source: Yohannes et al. 2006.

Barmah Forest virus: There were 1,052 notifications of Barmah Forest virus in 2004. As in previous years, the rates are highest in the Northern Territory and Queensland.

Dengue fever: A total of 326 cases were notified in 2004. Dengue is not common in Australia despite periodic outbreaks. A total of 181 cases were acquired in Australia in 2004, all of them in Northern Queensland; a further 145 cases were acquired overseas.

Three outbreaks of dengue in North Queensland in 2003–04 affected more than 890 persons (Yohannes et al. 2006).

Malaria: Cases notified in 2004 (a total of 559) were all from travellers returning from malaria-prone areas or from migrants from malaria-endemic areas. There were no cases of locally acquired malaria in 2004 (Yohannes et al. 2006).

Tuberculosis and other bacterial infections

Bacterial infections not covered by the disease groups described above—namely legionellosis, leprosy and tuberculosis—are grouped within the NNDSS as 'other bacterial infections'.

Australia has one of the lowest rates for tuberculosis globally (AIHW 2004b). There has been little change in the profile of tuberculosis in Australia over the last decade or so. In 2004, a total of 1,076 cases of tuberculosis were notified in Australia, 82% of these being in persons born overseas (Roche & Lum 2006). There were 833 hospital separations with the principal diagnosis of tuberculosis in the year 2003–04, with slightly more hospital separations among females (58%) than males (42%). There were 63 tuberculosis deaths (34 males and 29 females) in 2004, with an age-standardised rate of around 0.3 per 100,000 persons.

Prion diseases

A more recently described mode of transmission of communicable diseases is through prions. These are distinct from other infectious diseases because a protein, termed a prion, is the agent and it does not use the normal genetic apparatus of DNA or RNA to multiply and spread.

Prion diseases are often called transmissible spongiform encephalopathies (TSEs). They are marked by a spongy (spongiform) deterioration of the brain (encephalus). TSEs cause severe neurological symptoms, leading eventually to death in both humans and animals.

Creutzfeldt-Jakob disease (CJD) is the main human form of prion disease. It is a rapidly progressive disease. The disease is notifiable in some states and territories. The Australian National CJD Registry, established in 1993, undertakes surveillance and diagnosis of CJD, and other human TSEs (Klug et al. 2005).

By 2004, the Australian National CJD Registry had recorded 572 cases of CJD in Australia since 1970 (Klug et al. 2005). More than 91% of the cases were sporadic in nature; cases running in families constituted 7% of the total. No significant sex differences have been noted in CJD incidence.

The duration of CJD illness varies, with an average survival time of less than eight months. A total of 266 deaths have been recorded in Australia since 1979, with 24 deaths reported in 2004. No significant variation in jurisdictional death rate is noted for CJD (Ladogana et al. 2005).

Variant Creutzfeldt-Jakob disease (vCJD) is the human form of bovine spongiform encephalopathy (BSE), a prion disease affecting livestock, and is transmitted to humans who consume infected beef. It was first recognised in 1996. No cases of either BSE or vCJD have been reported in Australia.

Vaccine-preventable diseases

Many communicable diseases are regarded as vaccine-preventable diseases (VPD) in that effective vaccines are now available for their population control and prevention. The decline in the incidence of various VPDs proves the effectiveness of disease prevention through vaccination. Even more striking is the reduction in the number of deaths from these diseases since the pre-vaccination period (Table 2.37).

Table 2.37: Trends in mortality from vaccine preventable diseases, 1925–2003 (10-yearly average)

	Number of deaths						
Decade	Diphtheria	Pertussis	Tetanus	Poliomyelitis	Measles	Tuberculosis	Pneumonia
1907–1916	6,384	4,135	702	n.a.	2,143	37,239	28,849
1917–1926	5,511	3,240	929	194	1,376	35,600	35,767
1927–1936	4,205	2,732	879	430	1,037	31,496	41,809
1937–1946	2,456	1,510	655	618	863	25,979	40,364
1947–1956	517	365	625	1,053	457	14,221	31,892
1957–1966	31	52	280	117	183	4,551	33,956
1967–1976	11	15	76	63	140	1,791	27,550
1977–1986	2	13	31	71	56	1,022	18,692
1987–1996	2	12	16	75	31	876	17,188
1997–2004	1	13	6	112	1	712	21,178

n.a. not available

Source: AIHW National GRIM Books.

With improved molecular and immunological techniques, a variety of effective and safe vaccines is being regularly introduced into public health programs. There have been several major vaccination initiatives in the last decade alone for children, the elderly and Indigenous Australians.

In addition to diseases covered by the routine childhood vaccination schedule (diphtheria, *Haemophilus influenzae* type b (Hib) disease, measles, mumps, rubella, tetanus, polio and pertussis), many other diseases are now covered by the Australian Standard Vaccination Schedule.

An indirect measure of the effectiveness of vaccination programs is the extent of vaccine coverage, and this is discussed in Chapters 3 and 5. Other important measures of their effectiveness are disease notifications, the use of health services and the number of deaths (Table 2.38).

Diphtheria: The diphtheria vaccine is highly effective in preventing diphtheria. Maintaining high rates of immunisation against the diphtheria organism is the only way to ensure that diphtheria infection in Australia remains a disease of the past (Gidding et al. 2000). A case of unspecified diphtheria was reported in the Northern Territory in May 2004.

Hib: *Haemophilus influenzae* type b is a significant cause of morbidity and mortality world-wide. Vaccination of infants and young children with Hib vaccines has had a marked impact on the occurrence of this disease in Australia, and its notifications have declined significantly from 533 in 1991 to just 15 in 2004.

Table 2.38: Vaccine-preventable diseases: numbers of notifications, hospital separations and deaths, 2003–2004

Disease	Notifications (2004)	Separations (2003–04)	Deaths (2004)
Diphtheria	0	1	0
Hib	15	0	0
Invasive meningococcal disease	408	683	35
Measles	45	30	0
Mumps	102	35	1
Polio	0	1	0
Rubella	33	12	1
Tetanus	8	12	1
Pertussis	8,557	302	8

Sources: National Notifiable Diseases Surveillance System; AIHW National Hospital Morbidity Database; AIHW National Mortality Database.

Influenza and pneumonia: Influenza and pneumonia can not be eliminated with current methods, but some prevention of their onset and complications is possible through targeted vaccination. Annual influenza vaccines, matching the circulating virus strains, help reduce morbidity.

Invasive meningococcal disease: Invasive meningococcal disease is due to infection with meningococcus bacteria, *Neisseria meningitidis*, which causes serious conditions including septicaemia and meningitis. Vaccination against meningococcal C disease was introduced for all Australian children at 12 months of age in 2003, with a large catch-up campaign to vaccinate children and adolescents up to the age of 19 years also in 2003 (Cohen 2003).

Meningococcus bacteria occur as 13 different types, five of which cause disease in humans. The most common forms in Australia are types B and C. In 2004, there was a 45% decline in laboratory-confirmed cases of the C type and a 15% decline in the B type, compared with 2003 (Tapsall 2005).

There were 408 notifications of meningococcal disease (crude annual rate of 2.0 per 100,000 persons) in 2004. Notification rates were the highest in those aged 0–4 years and 15–19 years, with rates of 10.4 and 4.8 per 100,000 persons, respectively.

In 2003–2004, there were 683 hospital separations for meningococcal disease. Those aged under 25 years accounted for the majority of these separations (80%). Meningococcal infections accounted for 23 deaths in 2004 (17 males and 6 females).

Measles: Effective surveillance mechanisms and high levels of immunisation have ensured that Australia is now in the WHO 'elimination phase' of measles control (WHO 2001b). There has been a large decline in the measles notification rate following the introduction of a two–dose vaccination schedule in 1994 (Gidding et al. 2001), the Measles Control Campaign in 1998 (Turnbull et al. 2001), and improved coverage as part of the routine childhood vaccination schedule.

In 2004, there were 45 notifications of measles, a 54% decrease compared with 2003. Twenty-one of these cases occurred in six outbreaks in four different states. In four of the six outbreaks the first identified cases had acquired the infection outside Australia. The notification rates were highest in the 25–29 years age group (1.2 per 100,000 persons), followed by those aged 0–4 years and 30–34 years (0.5 cases per 100,000 persons). There were only six cases in those under five years, of which three were aged less than one year.

Hospital separations for measles are currently in decline, falling from 61 separations in 1988–89 to 30 in 2003–04. No deaths have been attributed to measles since 1995, when there were five deaths.

Mumps: Mumps is not a highly visible cause of morbidity or mortality. Infection most commonly occurs in childhood, and there are few long-term complications. The highly effective mumps vaccine protects individuals as well as interrupting transmission. Mumps elimination at a regional or geographical level is feasible.

There were 102 notifications of mumps in 2004, at a rate of 0.5 per 100,000 persons, a 24% increase on 2003. The highest rate was observed in the 25–29 years age group (1.3 per 100,000 persons).

In 2003–04, there were 35 hospital separations with the principal diagnosis of mumps. There were 18 separations for males and 10 for females, and almost one in two (43%) of the cases were aged under 20 years.

Polio: Progress towards global eradication of polio has been dramatic. Both inactivated poliovirus vaccines and live attenuated poliovirus vaccines are highly protective.

Rubella: A total of 5,750 cases of rubella were notified in Australia in 1995, and the numbers have declined greatly since then. In 2004, there were 33 notifications (a crude rate of 0.2 per 100,000 persons), the lowest rate on record and a 40% reduction on 2003. The ratio of male to female notifications was 1:1. There were 12 hospital separations for rubella in 2003–04, and one rubella death was reported in 2004.

Rubella infection in pregnancy can lead to fetal death or miscarriage. Its other major consequences are congenital deformities, including deafness, blindness, cardiovascular abnormalities and mental retardation.

One case of congenital rubella infection acquired overseas was identified in 2002 and two similar cases occurred in 2001 (Forrest et al. 2003). In 2003, two cases of locally acquired congenital rubella infection were reported, and in 2004 another case occurred in a child born to an unvaccinated, overseas-born mother.

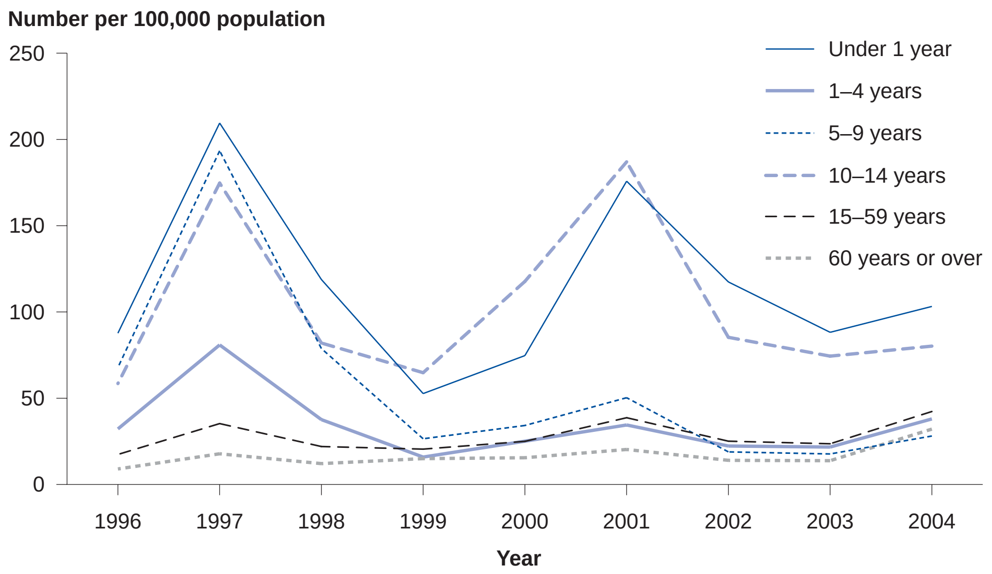
Tetanus: The tetanus vaccine is nearly 100% effective in protecting individuals for many years. All Australians at age 50 years are recommended to be immunised against tetanus with a routine booster dose.

Since 1995, less than eight cases of tetanus have been notified annually and only five cases were notified in 2004. All occurred in persons aged 60 years or over, consistent with the older age distribution of tetanus occurrence in recent years.

In 2003–04, there were a total of 12 hospital separations with the principal diagnosis of tetanus. There have been less than six deaths from tetanus since 1999, and in 2004 there was one death.

Whooping cough (pertussis): Whooping cough is a frequently notified vaccine-preventable disease. While immunisation is highly effective in children, elimination of pertussis may be difficult. Two groups play an important role in the continuing circulation of *Bordetella pertussis*—infants too young to be vaccinated, and adolescents and adults whose protection due to childhood vaccination has worn off.

Since 1993, an average of 5,000 cases of pertussis have been notified annually, except in 1997 and 2001 (Figure 2.42). An epidemic of pertussis occurred in 2001 with 9,325 cases notified (48 cases per 100,000 persons) and a total of 8,557 cases were reported in 2004.



Source: National Notifiable Diseases Surveillance System.

Figure 2.42: Age-specific trends in pertussis notifications, 1996 to 2004

The highest notification rates in 2004 were among children under one year of age (262 cases; 103 cases per 100,000 persons) and those aged 10–14 years (1,112 cases; 80 cases per 100,000 population). The notification rate in persons aged 60 years or over rose dramatically between 2003 and 2004 (14 compared with 34 cases per 100,000 persons). This is in contrast to the relatively steady annual rates previously seen in this age group.

Most of the pertussis cases (74%) were in persons aged 15 years or over. Although severe morbidity and mortality are less likely in these age groups, they constitute an important reservoir, facilitating transmission to children too young to be fully vaccinated.

Whooping cough was the principal diagnosis in 632 hospital separations in 2003–04, where almost 70% of the separations were of infants. There were no deaths due to pertussis in 2004.

Emerging infectious diseases

New infectious diseases continue to emerge worldwide. In the past few decades at least 30 new infectious diseases have been described (Clarke 2004). HIV, perhaps the most widely known new infectious disease, has infected millions of people within a short period and continues to spread around the world.

One of the more recently emerging infectious agents is the H5N1 virus causing avian influenza. Of the few avian influenza viruses that have crossed the species barrier to infect humans, the H5N1 virus has caused the largest proportion of cases of severe disease and death.

Unlike normal, seasonal influenza in which infection causes only mild respiratory symptoms in most people, the disease caused by H5N1 follows an unusually aggressive clinical course with rapid deterioration and high fatality. Primary viral pneumonia and multi-organ failure are common. More than half of those infected with the H5N1 virus in the current outbreaks have died. Most of the cases occurred in previously healthy children and young adults (Table 2.39).

Table 2.39: Human cases[(a)] of avian influenza, 2004 to 2006

	2004		2005		2006		Total[(d)]	
Country	**Cases[(b)]**	**Deaths[(c)]**	**Cases[(b)]**	**Deaths[(c)]**	**Cases[(b)]**	**Deaths[(c)]**	**Cases[(b)]**	**Deaths[(c)]**
Cambodia	0	0	4	4	0	0	4	4
China	0	0	8	5	7	4	15	9
Indonesia	0	0	17	11	10	9	27	21
Iraq	0	0	0	0	2	2	2	2
Thailand	17	12	5	2	0	0	22	14
Turkey	0	0	0	0	12	4	12	4
Viet Nam	29	20	61	19	0	0	90	39
Total	46	**32**	**95**	**41**	**31**	**19**	**172**	**92**

(a) Reported to WHO as at 6 March 2005; WHO reports only laboratory-confirmed cases.

(b) Cases of humans with laboratory-confirmed avian influenza A/(H5N1).

(c) Deaths of humans from laboratory-confirmed avian influenza A/(H5N1).

(d) There were an additional three cases and three deaths in Vietnam in 2003.

Note: The total number of cases includes number of deaths.

Experts at WHO and elsewhere believe that the world is now closer to another influenza pandemic than at any time since 1968, when the last of the previous three pandemics occurred (also see the Chapter 7 section on pandemic planning).

2.9 Injury

Injury has a major but largely 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. For these reasons, injury prevention and control was declared a National Health Priority Area in 1997, and is the subject of a national prevention plan (NPHP 2005). Table 2.40 summarises the impact of injury in Australia.

This section describes both acute and chronic aspects of serious injury. Most of the information presented here is drawn from deaths and hospital separations data.

Table 2.40: Overview of injury in Australia

Aspect	Estimated number	Year	Description	Data source
Injury as an acute condition				
Fatal outcomes	7,966	2004	Deaths registered with an external cause assigned as the underlying cause of death	AIHW National Mortality Database
Hospitalised, high threat-to-life	52,750	2003–04	Admitted to hospital with injury conditions that carry 6% or greater likelihood of dying in hospital during acute care	AIHW National Hospital Morbidity Database
Hospitalised, total	344,849	2003–04	Number of persons hospitalised due to injury	AIHW National Hospital Morbidity Database
Recent injury event	3,614,400	2004–05	Persons injured in the four weeks before interview who, consequently, took any of a range of actions (including reducing usual activities, seeking treatment, etc.)	ABS (2006b)
Injury as a chronic condition				
Profound or severe disability	65,400	2003	Persons living with profound or severe limitation of communication, mobility or self-care due to the effects of injury	ABS (2004c)
Long-term conditions	2,094,200	2004–05	Persons with a long-term condition resulting from injury	ABS (2006b)

Hospitalised injury

Injury accounted for over one in 20 hospital separations in Australia in the year 2003–04, with more than 370,000 inpatient episodes that year (AIHW 2005a). It is important to note that, as with many other reasons for hospitalisation, the number of people hospitalised for injury may be smaller than the number of inpatient episodes. This is because some injuries may result in more than one episode. Table 2.41 provides an overview of injury hospitalisation in 2003–04.

Table 2.41: Hospital separations due to injury[(a)], 2003–04

Measure	Males	Females	Persons[(b)]
Number of hospital separations due to injury	215,840	156,690	372,533
Total number of hospital separations	3,194,681	3,646,434	6,841,192
Injury separations as percentage of all separations	6.8%	4.3%	5.4%
Estimated number of injury separations[(c)]	200,061	144,785	344,849
Crude rate (per 100,000 persons)	2,014	1,440	1,725
Adjusted rate (per 100,000 persons[(d)])	2,042	1,356	1,717
Total number of patient days	667,292	734,022	1,401,317
Average number of patient days/separations	3.3	5.1	4.1
Number of high threat-to-life separations[(e)]	25,822	26,927	52,750

(a) Includes separations where the principal diagnosis was coded to ICD-10-AM S00–T75 or T79.

(b) Includes separations where sex is missing or indeterminate.

(c) Omits inward transfers from acute care hospitals.

(d) Adjusted by direct standardisation to the Australian population as at 30 June 2001.

(e) Defined as an ICD-based Injury Severity Score of <0.941 (weights from AIHW: Stephenson et al. 2003).

Source: AIHW National Hospital Morbidity Database.

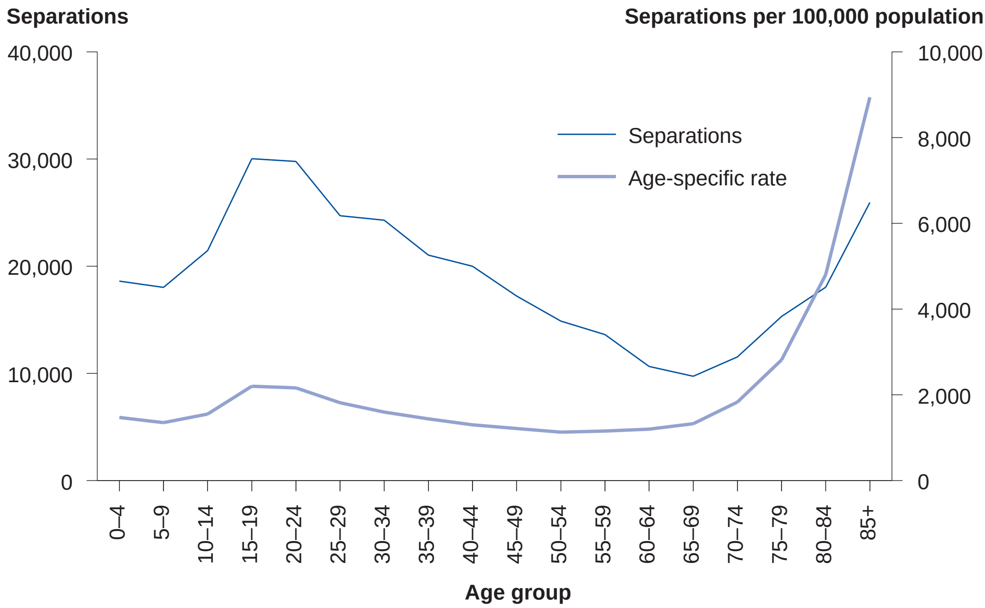
The incidence of injury is considerably higher in males than females, both overall and for most types of injury. However, females are, in general, hospitalised for half as long again as males, and more female separations are rated as 'high threat-to-life' separations. The difference mainly reflects the larger number of older females hospitalised for serious injuries such as hip fractures (see Fall-related injury at older ages later in this section).

The separations described as 'high threat-to-life' are those with injury diagnoses that had a 6% or higher chance of a fatal outcome in hospital (AIHW: Stephenson et al. 2003). Injury of this severity is likely to have a large impact on the patient, often with persisting problems and the need for health care services. In 2003–04, almost 15% of separations fell in this group (13% of male separations, 19% of female), which in turn accounted for 43% of acute care patient days for injury.

Age is an important factor in both the number of separations and the rate of hospitalised injury. Figure 2.43 shows that young adults produce the most separations, late middle-age the least, but those in advanced old age again produce many separations. However, apart from a peak reflecting the many separations among young adults, rates of hospitalised injury vary less with age. The exception is in old age, where the rate rises sharply.

The rate of hospitalised injury among those aged 85 years or over in 2003–04 was more than 8,900 per 100,000 persons, equivalent to 1 person in 11 in this age range being admitted to hospital. This high rate is almost entirely due to injury following a fall.

The rate of hospital separation for injury was markedly higher in males than in females (Table 2.41). The gap was the largest in young adults, mostly due to transport injuries (mainly road crashes), interpersonal violence and self-inflicted injuries. However, the male injury excess was not consistent across age groups. At older ags, the female rate exceeded the male rate.



Note: Includes separations where the principal diagnosis was coded to ICD-10-AM S00–T75 or T79; the rate is age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Hospital Morbidity Database.

Figure 2.43: Injury hospitalisation, number of separations and rates by age, 2003–04

External causes of injuries

Injuries result from exposures and events that are commonly called the 'external causes' of injury. Table 2.42 summarises the various types of external causes of injury, dividing them into 'unintentional' and 'intentional', and their severity in cases admitted to hospital. About five out of six injury cases hospitalised in 2003–04 were recorded as unintentional—that is, the injuries were not caused deliberately.

Falls and transportation are common external causes of injury overall (50% of all hospitalised injury separations) and especially for high-threat separations (79%). Falls accounted for 36% of hospitalised injury separations.

Table 2.42: Hospitalisation due to injury, by type of external cause, 2003–04

	All separations[(a)]			High threat-to-life[(b)]			
External cause[(c)]	Number	Per cent	Rate[(d)]	Number	Per cent	Rate[(d)]	Per cent on high threat[(e)]
Unintentional							
Transportation	48,511	14.1	243.6	11,503	21.8	57.5	23.7
Drowning and immersion	494	0.1	2.5	445	0.8	2.3	90.0
Poisoning, pharmaceuticals	7,611	2.2	38.4	126	0.2	0.6	1.7
Poisoning, other substances	2,672	0.8	13.5	97	0.2	0.5	3.6
Falls	123,461	35.8	605.1	30,023	56.9	143.5	24.3
Fires/burns/scalds	5,117	1.5	26.0	1,079	2.0	5.5	21.1
Other unintentional	109,805	31.8	550.6	4,598	8.7	22.6	4.2
Intentional							
Self-inflicted	22,950	6.7	115.4	995	1.9	5.0	4.3
Inflicted by another person	19,325	5.6	97.5	3,402	6.4	17.2	17.6
Undetermined intent	2,902	0.8	14.6	131	0.2	0.7	4.5
Other and missing	2,001	0.6	9.8	351	0.7	1.7	17.5
Total	**344,849**	**100.0**	**1,717.0**	**52,750**	**100.0**	**257.0**	**15.3**

(a) Includes separations where the principal diagnosis was coded to ICD-10-AM S00–T75 or T79.

(b) ICD-based Injury Severity Score <0.941 (weights from AIHW: Stephenson et al. 2003).

(c) ICD-10-AM External Causes codes aggregated as in AIHW NISU 2006.

(d) Adjusted by direct standardisation to the Australian population as at 30 June 2001; the rate is given as number of separations per 100,000 persons.

(e) Number of high-threat as a percentage of total number.

Source: AIHW National Hospital Morbidity Database.

Injury deaths

Around 6% of all deaths registered in Australia in 2004 were considered to be due to injury, almost 22 per day (Table 2.43). The overall injury death rate was more than twice as high for males as for females. During the first year of life, congenital and perinatal conditions are the most common cause of death, but injury is the most common cause from early childhood through to middle age. In 2004, 47% of all deaths of persons aged 1–44 years were due to injury.

Table 2.43: Injury deaths—numbers, proportions and rates, 2004

Measure	Males	Females	Persons
Number of deaths[(a)]	5,285	2,681	7,966
Proportion of all deaths	7.7%	4.2%	6.0%
Crude rate per 100,000 population	52.9	26.4	39.6
Adjusted rate per 100,000 population[(b)]	55.1	23.4	38.8

(a) Deaths registered during 2004 for which an 'external cause' was coded as the underlying cause of death (ICD-10 V01–Y98).

(b) Adjusted by direct standardisation to the Australian population as at 30 June 2001; the rate is given as number of deaths per 100,000 persons.

Source: AIHW National Mortality Database.

The 7,966 deaths attributed to injury in 2004 are those coded as the 'underlying cause' of death. However, in a further 3,744 deaths registered in 2004, an injury was listed as an 'additional cause' of death, meaning that injury was considered to have contributed to death.

Intentional self-harm or suicide (26%), transport injury (21%) and falls (20%) accounted for nearly two-thirds of injury deaths in 2004. Suicide was the most frequent external cause of injury death among males, while injury due to unintentional falls was the most common cause among females (Table 2.44).

Table 2.44: Injury deaths, by type of external cause, 2004

	Males			Females			
External cause[(a)]	**Count**[(b)]	**Per cent**	**Rate**[(c)]	**Count**[(b)]	**Per cent**	**Rate**[(c)]	**Male:female rate ratio**
Unintentional							
Transportation	1,236	23.4	12.4	453	16.9	4.4	2.8
Drowning & immersion	146	2.8	1.5	51	1.9	0.5	2.9
Poisoning[(d)]	507	9.6	5.1	230	8.6	2.2	2.3
Falls	661	12.5	8.0	897	33.5	6.6	1.2
Fires/burns/scalds	52	1.0	0.5	51	1.9	0.5	1.1
Other unintentional	864	16.3	9.2	471	17.6	4.1	2.2
Subtotal	*3,466*	*65.6*	*36.7*	*2,153*	*80.3*	*18.3*	*2.0*
Intentional							
Self-inflicted	1,661	31.4	16.8	437	16.3	4.3	3.9
Inflicted by another person	107	2.0	1.1	61	2.3	0.6	1.8
Subtotal	*1,768*	*33.5*	*17.6*	*498*	*18.6*	*4.9*	*3.6*
Undetermined intent	*51*	*1.0*	*0.5*	*30*	*1.1*	*0.3*	*1.4*
Total	**5,285**	**100.0**	**55.1**	**2,681**	**100.0**	**23.4**	**2.3**

(a) ICD-10-AM external cause codes aggregated as in AIHW NISU: Kreisfeld et al. 2004.

(b) Deaths registered during 2004 for which an 'external cause' was coded as the underlying cause of death (ICD-10 V01–Y98).

(c) Adjusted by direct standardisation to the Australian population as at 30 June 2001; the rate is given as number of deaths per 100,000 persons.

(d) Includes ICD-10 codes X40–X49 only; codes F11–F16 and F19 used in AIHW NISU: Kreisfeld et al. 2004 have not been included here.

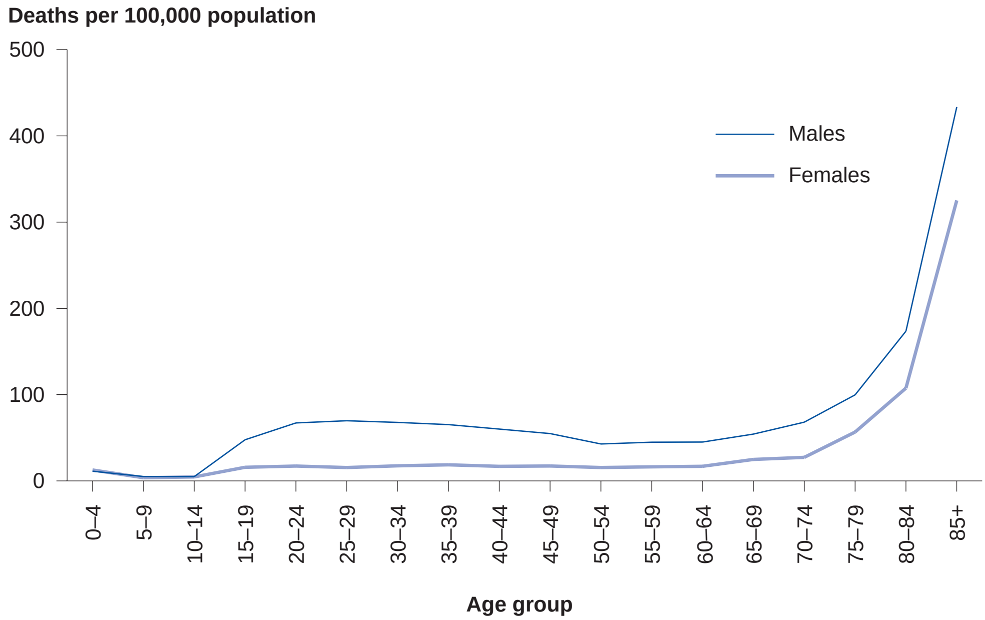
Source: AIHW National Mortality Database.

Injury death rates are relatively low in childhood (Figure 2.44). Mortality from all causes is low in this age group, but injury notably accounted for about 36% of all deaths between the ages of one and 14 years in 2004. Prominent external causes of death in childhood were drowning (especially for toddlers), transport injuries (especially as pedestrians and cyclists) and interpersonal violence (especially affecting infants).

Injury is the main cause of death in the age range during which teenagers become adults. In 2004, 71% of all deaths of those aged 15–24 years were due to injuries, mainly due to transport injuries and suicide.

Suicide and transport-related injuries are prominent causes of injury death in middle age as well. Fall-related injuries dominate older ages.

Aboriginal and Torres Strait Islander peoples have injury death rates three times as high as for other Australians (AIHW: Helps & Harrison 2004). Suicide and transport-related injuries are the most common causes of fatal injury among Indigenous Australians, as is the case in the general population.



Note: Includes deaths registered during 2004 for which an 'external cause' was coded as the underlying cause of death (ICD-10 V01–Y98).

Source: AIHW National Mortality Database.

Figure 2.44: Injury death rates by age and sex, 2004

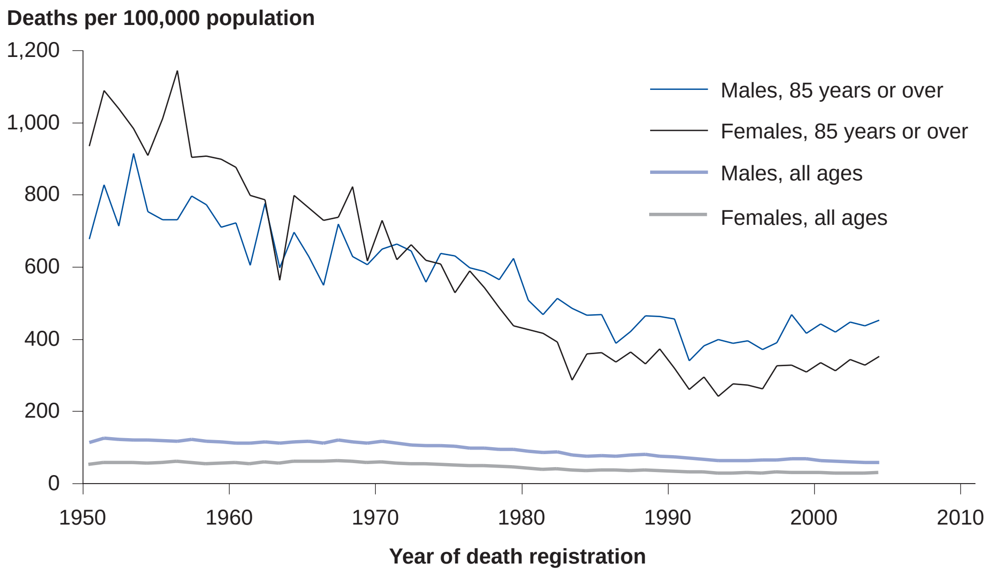
Trends in injury mortality

The injury (and poisoning) death rates in Australia halved during the past 50 years—from 116 deaths per 100,000 males in 1955 to 55 in 2004, and a corresponding fall for females from 51 to 23 deaths per 100,000 females. However, since the early 1990s the injury death rates have steadily increased for persons aged 85 years or over: from 337 to 449 deaths per 100,000 males, and from 238 to 349 deaths per 100,000 females (Figure 2.45).

The increase in injury death rates for those aged 85 years or over has been due to increases in mortality following falls. The rate of deaths following falls increased from 55 deaths and 42 deaths per 100,000 in 1996, to 144 deaths and 126 deaths per 100,000 in 2004, for males and females, respectively, in this age group.

The male suicide rate in Australia for the last three decades has been around 20 deaths per 100,000 males. However, since 1997, the rate has fallen from 23.6 deaths per 100,000 males to among the lowest (16.8 in 2004) since collections began in 1907 (excluding the World War II period). This drop has mainly been driven by the drop in the suicide rate of 15–24 year old males, where the rate has halved from over 27 deaths per 100,000 in the early 1990s to below 14 in 2004. The suicide rate for females has been constant at around 5 deaths per 100,000, and currently sits at 4.3 deaths per 100,000—one of the lowest rates recorded since 1907. Note, while the number of deaths coded to suicide in recent years decreased, this may in part reflect the increase in open coroner's cases when the statistics were finalised (ABS 2006d).

Deaths from transport-related accidents are also the lowest since World War II, the period when motor vehicles became the preferred means of transport. Death rates have consistently fallen between 1970 and 2004, from a high of 53 deaths to 12 deaths per 100,00 males and from 14 deaths to 4 deaths per 100,000 females.



Note: Age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National GRIM Books.

Figure 2.45: Trends in injury mortality, 1950 to 2004

Risk factors for injury

Alcohol is the most important risk factor for both fatal and non-fatal injuries in Australia. About 1,100 injury deaths and 27,000 injury hospitalisations yearly have been attributed to alcohol for the 10-year period to 2001 (Chikritzhs et al. 2003).

Although injury is mostly an acute condition, several chronic factors contribute to the risk to injury. Osteoporosis is a classic example of a chronic risk factor for injury (see Fall-related injury at older ages). Other examples are depression and schizophrenia, acting as risk factors for suicide and self-harm. Alcohol dependency is also a risk factor for many types of injury.

Injury as a chronic condition

While recovery from most minor injuries is rapid and essentially complete within weeks, serious injuries often have lasting consequences. The nature of these injuries, their relationship to prior injury, and their impact on health and wellbeing are less well documented than the immediate consequences of injury.

An indication of the extent of these problems is provided by the NHS (ABS 2006b). In 2001, the NHS estimated that almost 2.1 million Australians (12% of the total population) had a long-term condition due to an injury (Table 2.40). The 2003 Survey of Disability, Ageing and Carers (ABS 2004b) estimated that 25,600 persons were living with disabilities due to injury that resulted in profound limitation of core activities (that is, communication, mobility and self-care). Another 39,800 reportedly had severe activity limitations.

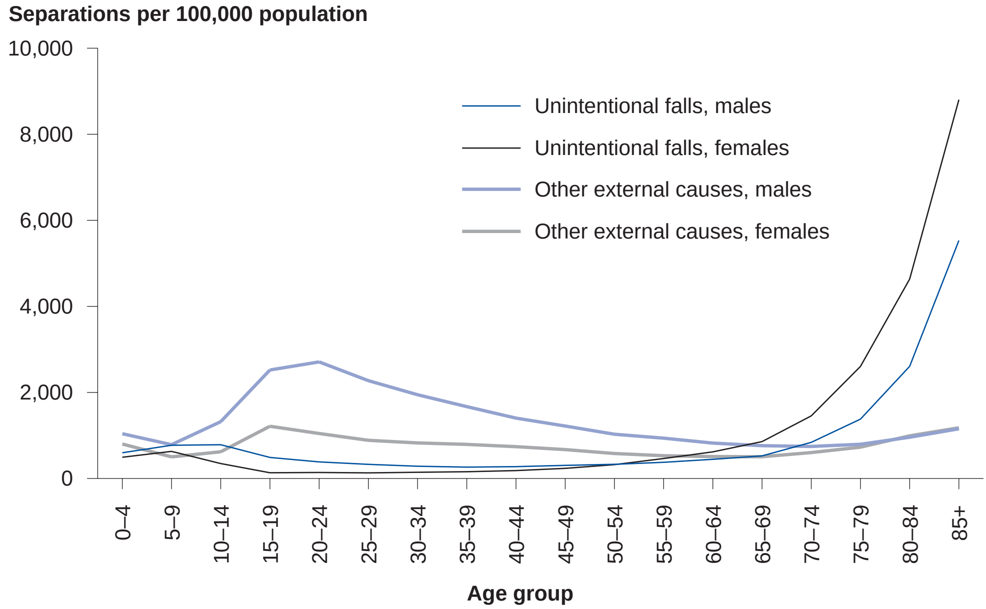
At the most severe end of the injury spectrum are cases that are sometimes described as ‘catastrophic injury’. Walsh et al. (2005) have estimated that each year about 770 Australians survive injury with consequences so serious that they will require lifetime care and support. The great majority of these cases have traumatic brain injury or persisting spinal cord injury. The number of Australians living with persisting spinal cord injury due to trauma has been estimated at 8,500 (AIHW: Cripps 2006). About 70% of these injuries occur in persons under the age of 30 years, resulting in a lifetime of care.

Moderate to severe traumatic brain injury often leaves people with intellectual impairments and limitations, sometimes severe, in activities of daily living (Colantonio et al. 2004). Poor quality of life and poor subjective wellbeing have been shown to persist with little change over time up to 15 years after brain injury (Teasdale & Engberg 2005). Children are found to have poor health-related quality of life up to two years after serious injury (Davey et al. 2005).

Fall-related injury at older ages

Falls account for about one-third of hospitalised injury and about one-fifth of fatal injuries in Australia. By far the highest rates of these injuries are at older ages (Figure 2.46). The risk of falling rises with age, due to a variety of factors that include weakening muscles, less acute position sense and visual defects (Sambrook et al. 2002).

A fall in old age is more likely than a similar fall at a younger age to result in a serious injury, such as a hip fracture. This is largely because the bone tends to weaken with age or osteoporosis, particularly after menopause in females. (See Section 2.6 for further information on osteoporosis.)



Note: Injury separations include separations where the principal diagnosis was coded to ICD-10-AM S00–T75 or T79.

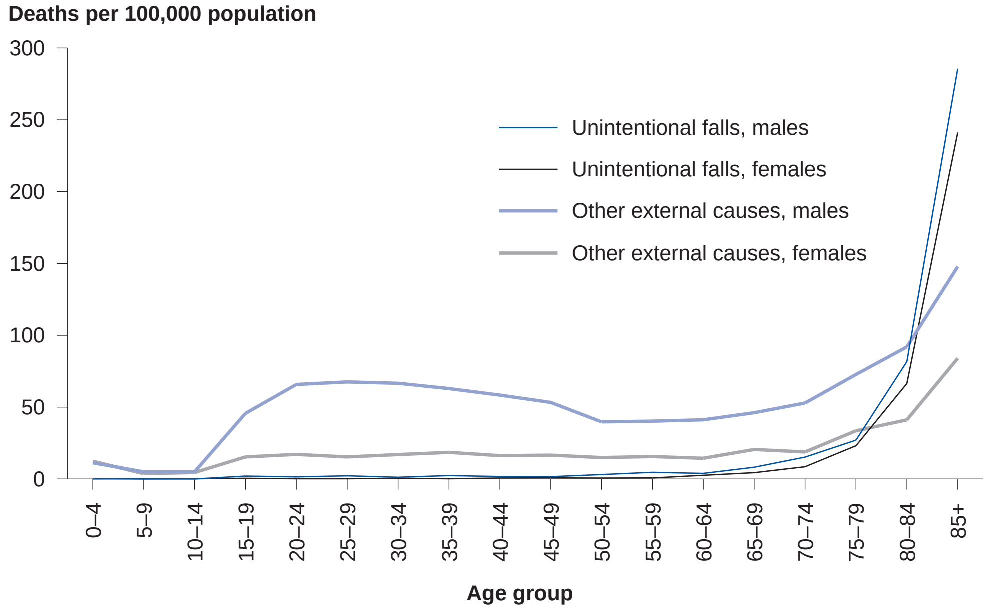
Source: AIHW National Hospital Morbidity Database.

Figure 2.46: Age-specific hospital separations for injury due to unintentional falls, 2003

Another contributory factor is that older people are less able to survive and recover from an injury than younger people. This is indicated by the proportion of people who died in hospital. In 2003–04, during acute care of a fractured femur, the inpatient death rates were 2 per 1,000 at ages younger than 50 years, 25 per 1,000 at ages 50 to 79 years, and 63 per 1,000 at older ages (Figure 2.47).

The number of fall-related hospital separations and deaths at older ages has increased in Australia, and can be expected to continue to rise for demographic reasons. The oldest segment of the Australian population is at greatest risk of sustaining these injuries, and this part of the population is growing rapidly. The ABS population projections forecast that the number of Australians aged 65 years or over will grow from 2.3 million in 1999 (12% of the population) to between 6.2 and 7.9 million in 2051—about a quarter of the population (ABS 2003).

Hospital separation rates for females for unintentional falls are greater than those for males. However, the death rate for males associated with those falls is considerably higher than the female rate, which suggests that injuries associated with males are of a different nature or intensity.



Note: Injury deaths include deaths registered during 2004 for which an 'external cause' was coded as the underlying cause of death (ICD-10 V01–Y98).

Source: AIHW National Mortality Database.

Figure 2.47: Age-specific death rates for injury due to unintentional falls, 2004

2.10 Summarising the burden of disease

Sections 2.3 through 2.9 have described the burden of disease and injury in Australia using a variety of measures. These include, among others, rates of disease incidence and prevalence, disability and mortality. The information has been supplemented with health care use, and with health expenditure data in some cases. To ensure good coverage, the information has also been presented for a range of specific diseases, conditions and injuries, as well as details across age and sex groups.

The varied nature of this information means that it is difficult to give one clear view of the extent of the burden of disease in Australia. It would therefore be ideal to summarise this vast information using a small number of measures.

A set of measures, called disability-adjusted life years (DALYs), has been developed under the auspices of the World Bank and the WHO, to summarise the burden of disease at a population level (see Box 2.9 for information on DALY terminology and its usage). The DALY measure was used to provide the first comprehensive assessment of the global burden of disease and injury (World Bank 1993). Subsequently, the WHO has used the measure for global health planning.

A comprehensive study of the burden of disease in Australia, using the DALY methodology, was first 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 2003 by the University of Queensland, in association with the AIHW (AIHW: Begg et al. in press). This section provides that information for several diseases and conditions. However, it should be noted that the estimates and statistics in this section are provisional at the time of writing.

Box 2.9: Disability-adjusted life years (DALYs)

DALYs constitute a summary measure of the burden of disease, combining information on both fatal and non-fatal disease outcomes. A main advance of this measure has been in giving 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 cause deaths, those deaths occur among younger people. The DALY measure was originally developed as part of the 1990 WHO and World Bank Global Burden of Disease study and has been adapted by the AIHW for the Australian context. In common with most summary health measures, the DALY uses time as a common 'currency'. It is a measure of the years of healthy life lost due to illness or injury – one DALY is one lost year of 'healthy' life.

There are two components of DALYs. Premature mortality is measured by the years of life lost (YLL) due to disease and injury, and non-fatal health outcomes are measured by the years of 'healthy' life lost due to poor health or disability (YLD) consequent upon disease.

YLL are calculated for each death according to the model life table; that is, life expectancy of a person of the same age as the person who died. YLD, on the other hand, are calculated for a given disease or condition by estimating the number of new cases of that disease or condition in a specified time. For each new case, the YLD is obtained by multiplying the average duration of the condition (to remission or death) by a severity weight that quantifies the equivalent loss of healthy years of life due to living with the condition.

The severity weights are derived to quantify societal preferences for health states – reflecting how people feel about the impact of different types of illness and disability on their functioning in everyday life, among other things. There are no comprehensive Australian measurements of such weights. The YLD quoted in this report are based on weights from a combination of sources. Where possible, the weights are taken from a Dutch study of selected diseases of public health importance (Stouthard et al. 1997). Where the Dutch weights are not available, the weights are taken from the 1990 Global Burden of Disease Study. Where these are not available, provisional weights are estimated using regression analysis based on the Dutch study results.

An annual discount rate of 3% is applied in calculating both the YLL and YLD. With this discount rate, a year of healthy life gained in 10 years time is worth 23% less than one gained now. For example, without discounting, a male infant death would result in 80 YLL, because this is the average male life expectancy in the burden of disease model life table. The same death would result in 30 YLL with discounting. All YLL, YLD and DALY figures presented in this chapter are based on new cases of disease, injury and death occurring in the calendar year 2003, and include discounting.

Premature mortality

Premature mortality was responsible for 1.28 million YLL in Australia in 2003 (Table 2.45). Unlike most measures of potential years of life lost, YLL do not exclude deaths above a specified age or years of life lost above that age. Australian males lost 25% more YLL than females in 2003.

Cancers (32%), cardiovascular diseases (29%) and injuries (11%) were responsible for about three-quarters of the total YLL in both sexes in 2003. In persons aged 75 years or over, cardiovascular disease accounted for close to half of total YLL, whereas cancers were more important a contributor to YLL than cardiovascular disease for those aged under 75 years (see also Section 2.5 for age-specific distribution of causes of death in Australia). 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 less than 5 years.

Non-fatal disease outcomes

The non-fatal component of the disease burden, assessed using the measure YLD, presents a substantially different picture than that provided by YLL. There was a loss of more than 1.4 million years of 'healthy' life due to disability consequent on disease in 2003. Table 2.45 shows the YLD distribution in Australia by major disease groups and injuries.

Table 2.45: Burden (YLL, YLD and DALYs)[(a)] of major disease groups, 2003

	Fatal component		Non-fatal component		Total	
Disease group	Total YLL ('000)	Per cent of total YLL	Total YLD ('000)	Per cent of total YLD	Total DALYs ('000)	Per cent of total DALYs
Cancers	414.4	32.4	98.7	6.8	513.1	18.8
Cardiovascular diseases	365.4	28.6	85.1	5.9	450.5	16.5
Mental disorders	23.1	1.8	327.1	22.5	350.2	12.8
Neurological and sense disorders	54.2	4.2	275.3	19.0	329.5	12.1
Injuries	138.8	10.9	106.6	7.3	245.4	9.0
Chronic respiratory diseases	71.4	5.6	130.2	9.0	201.6	7.4
Diabetes	30.0	2.3	115.7	8.0	145.7	5.3
Musculoskeletal conditions[(b)]	7.0	0.5	114.5	7.9	121.5	4.4
Genitourinary diseases	27.9	2.2	34.5	2.4	62.4	2.3
Digestive disorders	27.7	2.2	21.7	1.5	49.4	1.8
Infectious and parasitic diseases	28.2	2.2	19.1	1.3	47.3	1.7
Congenital anomalies	17.2	1.3	20.6	1.4	37.8	1.4
Neonatal conditions	19.0	1.5	12.3	0.8	31.3	1.1
Other[(c)]	54.6	4.3	90.7	6.2	145.3	5.3
Total	**1,278.8**	**100.0**	**1,452.0**	**100.0**	**2,730.8**	**100.0**

(a) Provisional estimates at the time of writing.

(b) Does not include osteoporosis.

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

Note: Because of methodological changes these 2003 numbers cannot be compared directly with the 1996 numbers from AIHW: Mathers et al. 1999.

Source: AIHW: Begg et al. in press.

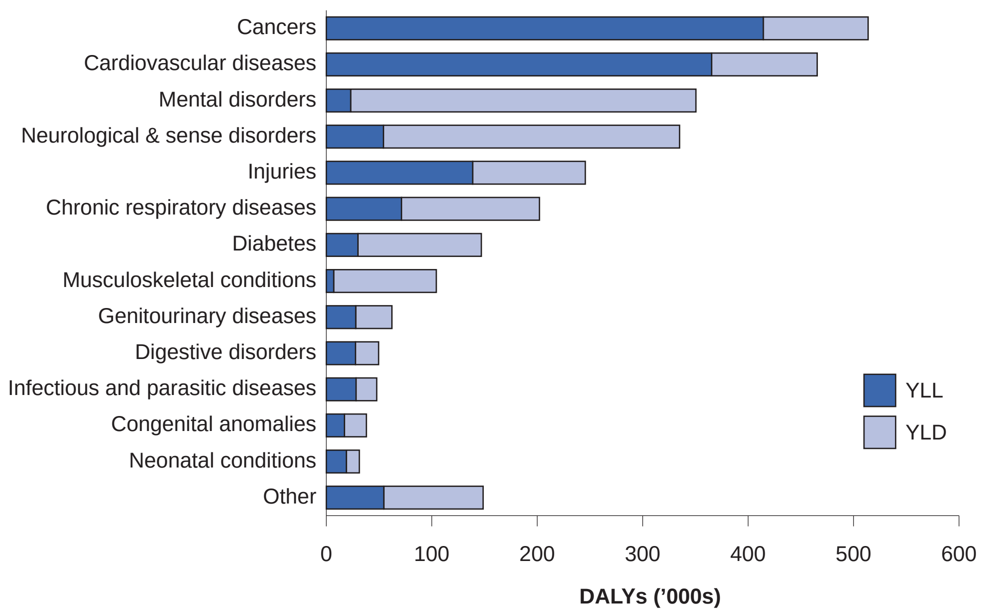
Mental disorders were the leading contributors to YLD in Australia, accounting for 23% of the non-fatal burden of disease in 2003. Neurological and sense disorders were responsible for another 19% of YLD. The latter category was dominated by dementia and hearing loss.

In contrast to YLL, the estimated 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, YLDs for cardiovascular disease, diabetes, chronic respiratory diseases and cancers were higher among males.

Total burden of disease and injury—DALYs

The total burden of disease and injury in Australia in 2003 is estimated to be 2.7 million DALYs. The male DALY burden was 10% higher than the female burden. YLDs were responsible for 50% of the male DALYs and 56% of the female DALYs.

Figure 2.48 shows the YLL and YLD contributions to total DALYs for major disease groups and injuries. Mental disorders were the third leading cause of overall burden (13% of total DALYs) after cancers (19%) and cardiovascular diseases (17%). Neurological and sense disorders (12%) were a larger contributor to total DALYs than injuries (9%).



Source: AIHW: Begg et al. in press.

Figure 2.48: Burden (YLL, YLD and total DALYs) of major disease groups, 2003

It should be noted that these DALY estimates represent the overall burden of disease remaining after preventive and treatment interventions have had their effect. Consequently, some disease groups are low in the DALY rankings because the preventive and treatment interventions 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, which was responsible for only 0.9% of all DALYs.

Leading specific causes of burden of disease

The DALY rankings described above were at the broadest level of disease groupings. The rankings presented in Table 2.46 show disease burden at a lower, more specific disease grouping level. The 20 leading specific contributors out of a total of 193 diseases accounted for about 60% of the 2003 DALYs. In this list are seven non-fatal or lower fatality diseases: anxiety and depression, asthma, chronic back pain, osteoarthritis, alcohol disorders, personality disorders and hearing loss.

Two of the top seven causes of disease burden, lung cancer and COPD, are mostly attributable to tobacco smoking; in addition, a large proportion of DALYs for ischemic heart disease and stroke are due to tobacco smoking.

Table 2.46: The 20 leading causes of burden of disease and injury, 2003

Rank	Condition	Percentage of DALYs
1	Ischaemic heart disease	9.8
2	Anxiety and depression	7.0
3	Type 2 diabetes	4.9
4	Stroke	4.1
5	Chronic obstructive pulmonary disease (COPD)	3.6
6	Lung cancer	3.3
7	Alzheimer's and other dementias	3.2
8	Colorectal cancer	2.4
9	Asthma	2.3
10	Breast cancer	2.3
11	Adult-onset hearing loss	2.2
12	Road traffic accidents	2.0
13	Suicide and self-inflicted injuries	1.9
14	Prostate cancer	1.4
15	Parkinson's disease	1.4
16	Osteoarthritis	1.3
17	Alcohol dependence and harmful use	1.2
18	Personality disorders (isolated)	1.2
19	Back pain (acute and chronic)	1.1
20	Schizophrenia	1.0
	All other causes	*42.4*
	All causes	*100.0*

Source: AIHW: Begg et al. in press.

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ABS 2005c. Births Australia 2004. ABS cat. no. 3301.0. Canberra: ABS.

ABS 2005d. Deaths Australia 2004. ABS cat. no. 3302.0. Canberra: ABS.

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3 Determinants of health

This chapter describes determinants of the health of Australians, providing a background for the great potential of prevention and health promotion. The conceptual framework of health for *Australia's health* (Figure 1.1 in Chapter 1) shows determinants as biomedical and genetic factors, health behaviours, socioeconomic factors and environmental factors. The determinants influence health and wellbeing, and can be influenced by interventions and by resources and systems.

The chapter's introduction presents a framework for determinants of health that illustrates how various determinants can relate to and influence other determinants as well as health and wellbeing. The chapter presents information on the main types of determinants of health in Australia and includes data, where available, on levels, patterns and trends.

3.1 What are health determinants?

The health of individuals and populations is influenced and determined by many factors acting in various combinations. The dominant view is that health is 'multicausal': healthiness, disease, disability and, ultimately, death are seen as the result of the interaction of human biology, lifestyle and environmental (including social) factors, modified by health interventions and other measures.

Health determinants can be described as those factors that raise or lower the level of health in a population or individual. Determinants help explain and predict trends in health and explain why some groups have better or worse health than others. They are the key to the prevention of disease, illness and injury.

Determinants may have positive or negative effects. Factors such as tobacco smoking or low socioeconomic status increase the risk of ill health and are commonly termed 'risk factors'. Positive influences such as a high intake of fruit and vegetables are known as 'protective factors'. Unlike behaviours, some determinants such as age, sex and genetics cannot be altered.

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 body weight above their 'optimal' level is associated with an increase in the risk of ill health. Although the increasing risk often starts at relatively low levels, the usual practice is to monitor a risk factor by reporting the proportion at the riskier end of the spectrum.

Determinants can vary in the extent to which they represent 'relative risk' and 'absolute risk' of developing disease. Those that represent a high relative risk are associated with relatively high proportions of people exposed to the risk factor developing disease, although the prevalence of the risk factor may be low, and the absolute number of people that develop disease may be low. Those determinants that represent a high absolute risk are usually associated with relatively high proportions of the population exposed to the risk factor, so that if levels of determinants change, even by small amounts, the result can be large changes in the absolute number of people who develop disease, even though the relative risk of developing disease may not be high. If, for example, a food product provided to a small group of people was contaminated with *Salmonella*, there would be a high relative risk of food poisoning among the group. However, as the product was only provided to the small group, there would be a relatively low absolute risk of poisoning from the food product in the population as a whole.

In addition to influencing the occurrence of new cases of disease or injury, determinants can affect the continuation and prognosis of chronic diseases and their complications. The use of health care interventions can also be regarded as a determinant in that context. They are described in Chapter 7 and are not covered here.

Determinants can also influence how individuals function, in terms of their activities and participation in society. Aspects of the physical environment can either facilitate functioning or act as a barrier to it, as can the availability of assistance from other people or aids and appliances (WHO 2001).

A framework for determinants

Determinants are in complex interplay and range from the 'upstream' background influences (such as culture and wealth), with many health and non-health effects that can be difficult to quantify, to immediate or direct influences with highly specific effects on particular aspects of health. They 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 3.1 is a simple framework of determinants and their pathways, with the general direction of effects going from left to right.

General background factors and environmental factors can determine the nature of socioeconomic characteristics and both can influence people's health behaviours, their psychological state and factors relating to safety. These in turn can influence biomedical factors, such as blood pressure and body weight, 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 each group in Figure 3.1 often interact and are highly 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 their physical activity levels, employment status and wealth.)

General background factors

General background factors affect virtually all people in society to some extent, although to varying degrees. These factors combine to influence the basic levels of security, safety, hygiene, nourishment, technology, information, freedom and morale of societies. It is difficult to put values and quantities on most of these broad factors, let alone measure them and assess their impact precisely. However, it is widely agreed that, at least up to a fair degree of societal development, they are a vital determinant of a population's health. They set the background level around which variations then occur between groups and individuals.

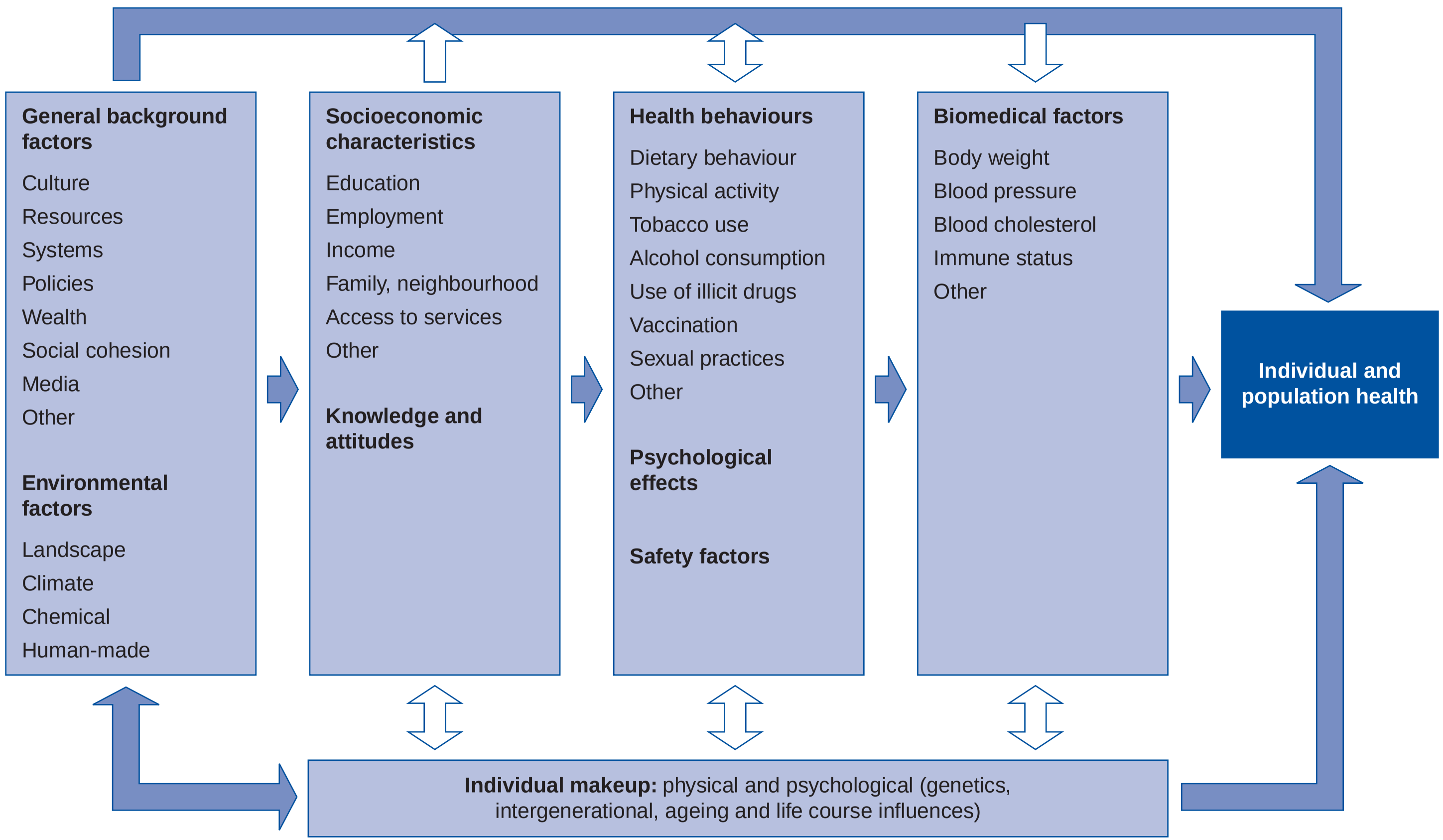


Figure 3.1: A conceptual framework for determinants of health

Included in these general background factors are wealth and social cohesion. Wealth or accumulated assets can buffer material living standards, for example in periods of low income (AIHW 2005a). The Household Income and Labour Dynamics in Australia survey showed that, in 2002, the least wealthy 50% of households owned less than 10% of total household wealth, while the wealthiest 10% owned 45% of total household wealth.

Social cohesion can be defined as the connections and relations between societal units, such as individuals, groups and associations, or the glue that holds communities together (AIHW 2005a), and links with aspects of socioeconomic characteristics in the framework. Levels of social cohesion are indicated by the fact that the majority of Australians are confident they can rely on their support network in times of crisis, and make contact with family and friends on a weekly basis. A third of Australians engage with the wider community, mostly as volunteers, and three-quarters donate money to charities and non-profit organisations. Markedly smaller percentages are civically engaged, in terms of being regularly involved in the activities of a political, advocacy or community organisation. However, less than half of Australians are socially trusting (that is, of less well-known acquaintances and strangers), domestic violence and child abuse remain very real for some Australian females and children, and rates of imprisonment increased markedly between 1994 and 2004 (AIHW 2005a).

Environmental factors

As described here, environmental factors include the physical environment, such as the climate, the land, plant and animal life, and human-made factors such as chemical pollution, the built environment and waste products. Among many things, these can affect a society's supply of water, and food and other primary products, and therefore its wealth, and they can influence where and how people live and spend their time. Large-scale environmental disruptions, such as human-induced climate change, can have major health implications in the longer term as well as in the short term. Environmental determinants are detailed further in Section 3.2.

Socioeconomic characteristics

Socioeconomic characteristics are influenced by society's policies, structures and history, and can be affected by environmental factors as well. Variations in socioeconomic characteristics can in turn lead to marked variations in health. Differences in people's levels of education and income, for example, can lead to strong differences in the opportunities and choices that affect their health. Socioeconomic characteristics that can influence health are described in Section 3.3.

Knowledge and attitudes

Knowledge, attitudes and beliefs are influenced by general background factors such as culture and resources, by education, and by families and social settings. They affect health through influencing lifestyle behaviours, help-seeking behaviours, and other health decisions. A selection is described in Section 3.4.

Health behaviours

General background factors, varying socioeconomic factors and knowledge and attitudes can influence health behaviours. A particular health behaviour such as an individual's diet, for example, can result partly from the general availability and range of foods due to the system as a whole. It can also reflect a person's 'inherent' preferences modified by cultural and family influences and by knowledge of food values. Finally, it may further reflect the person's financial and political freedom to exercise those preferences. Some important behavioural determinants of health are detailed in Section 3.5.

Psychological effects

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 that depression, social isolation and a lack of quality social support can lead to problems such as heart disease, independent of any intermediary behavioural effects (Bunker et al. 2003).

Safety factors

Safety factors can be regarded as related to behaviour, policies and to the built or human-made environment; and they are influenced by education, knowledge and attitudes, and also by socioeconomic influences on choices. Safety factors influenced by combinations of behaviour, socioeconomic conditions and policies include seat belt-wearing, home smoke detectors, unsafe product recalls, levels of crime, car airbags and road improvements.

Direct experiences or perceptions of safety can greatly affect a person's physical and mental health and wellbeing. Most but not all people feel safe or very safe at home after dark, an estimated 8.9% of households experienced at least one household crime in the 12 months prior to the 2002 National Crime and Safety Survey, and an estimated 5.3% of people over 15 years were victims of at least one personal crime (ABS 2003a). In the 2002 ABS General Social Survey, 9.0% of persons aged 18 years or over reported being victims of physical or threatened violence (ABS 2003b). The burden of injury was estimated (provisionally, at the time of writing) to be 245,600 disability-adjusted life years (DALYs) in 2003 (Chapter 2).

Biomedical factors

Biomedical risk factors are determinants derived from body measurements, such as overweight, high blood pressure and high blood cholesterol. Because they are 'within the body', biomedical risk factors can be regarded as 'downstream' in the causal process, and they can be shown to 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 to influence a variety of biomedical factors. Both physical activity and diet, for example, can affect body weight, blood pressure and blood cholesterol. They can do this alone or, with greater effect, together. Behavioural and biomedical risk factors tend to increase each other's effects when they occur together in an individual. Information on three important biomedical factors is presented in Section 3.6.

Individual makeup

Determinants act upon and are influenced by an individual's makeup, both physical and psychological. This makeup can greatly modify a person's response to other new or continuing determinants. It can be seen as the complex product of a person's genes, intergenerational effects, their ageing, and physical or social influences at various stages over their life course. These influences can become 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.

Determinants of the burden of disease

In most parts of 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 mortality. Table 3.1 aims to give a perspective on the impact of biomedical and behavioural determinants by providing an estimate (provisional at the time of writing) of their relative importance in 2003 measured in terms of their causal contribution to morbidity and mortality in Australia. From this, overweight was estimated to cause the most premature death and illness, followed by tobacco smoking and high blood pressure.

Table 3.1: Proportion of disease burden attributed to selected determinants of health (per cent)

Determinant	Males	Females	Persons
Overweight	8.8	8.3	8.6
Tobacco smoking	9.5	6.1	7.9
High blood pressure	7.5	7.0	7.3
Physical inactivity	6.5	6.8	6.7
High blood cholesterol	6.5	5.7	6.1
Alcohol harm	5.3	2.2	3.8
Alcohol benefit	–1.6	–2.1	–1.8
Occupational exposures	2.6	1.3	2.0
Illicit drugs	2.6	1.2	1.9
Lack of fruit/vegetables	1.9	1.0	1.4
Intimate partner violence	n.a.	2.1	1.0
Child sexual abuse	0.3	1.3	0.8
Unsafe sex	0.4	0.6	0.5

n.a. Not available.

Note: Attributable disability-adjusted life years (DALYs) as a proportion of total DALYs. One DALY equals one year of healthy life lost through premature death or living with disability due to illness or injury (see Chapter 2). Data are provisional at the time of writing.

Source: AIHW: Begg et al. in press.

3.2 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 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. This makes it challenging to estimate the full range and size of the harmful health effects of the environment. These include communicable diseases due to microbial contamination of food or water, vector-borne diseases transmitted by insects such as mosquitoes, respiratory and heart diseases due to air pollution and chemicals in workplaces, other consequences of chemical toxicity, effects of noise and heat, and injuries due to poorly designed traffic systems and home or workplace environments. The increasing interest in global climate change has focused attention on how ecological systems influence disease occurrence.

According to the 2001 State of the Environment report (Australian State of the Environment Committee 2001), urban air quality has generally improved since 1996, streetscapes and parks in most urban areas are better, and there is greater energy efficiency in residences. However, over the same period the quality of water bodies deteriorated and invasive species have continued to pose a serious problem. Furthermore, many of the warmest years on record in Australia have occurred in the last two decades, with 2005 having been the warmest.

Food quality

Contamination of food anywhere on 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. Various pesticides and other non-natural contaminants can also be found in some foods, but the estimated average dietary exposures to pesticides and other contaminants in Australia remain within acceptable health standards (FSANZ 2002).

Poor hygiene and temperature control in any part of the food production chain can potentially lead to illness. Preventing foodborne illness relies on a complex system of regulation, increasingly based on assessing risks associated with food businesses. The Hazard Analysis and Critical Control Point system relies on a food business identifying potential hazards and the control measures needed (NSW Health 2006). Food safety also depends on kitchen hygiene levels, including in households.

Foodborne infections

Foodborne pathogens that commonly cause gastroenteritis in Australia include the bacteria *Salmonella* and *Campylobacter* and viruses such as noroviruses (Sinclair et al. 2005). Sometimes the illness is part of a recognised 'outbreak' with a known food responsible for infecting a number of people. In 2004, 118 such outbreaks affected 2,076 people (OzFoodNet Working Group 2005).

Data from the OzFoodNet outbreak register indicate that high-risk foods include raw eggs, poultry, fish, oysters, and commercial foods like kebabs, bakery products and pizzas. 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, which 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).

Water quality

Providing a safe drinking water supply is fundamental to maintaining good public health. This includes issues of both quantity and quality. In modern Australia, with escalating demands for fresh water, there are increasing concerns about the sufficiency of supplies for domestic consumption and hygiene in some regions.

Water quality depends on controlling the concentrations of potentially harmful chemical and microbial contaminants, which may originate from natural or human-made sources. In Australia, 93% of 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 (7.6%) (ABS 2005a).

Fluoridation of tap water delivers public health benefits by reducing dental caries, and about two-thirds of Australians are currently supplied by fluoridated mains water (Box 3.1).

Box 3.1: Population exposure to fluoridated drinking water

The most effective public health measure for preventing dental decay is the adjustment of fluoride in drinking water to a range of 0.5 parts per million to 1.0 part per million (varying by climate to reflect differences in patterns of water consumption). Over two-thirds of Australians (69.1%) live in areas where the public water supply meets these requirements. 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 not fluoridated.

Exposure to fluoridated drinking water[(a)]

State/territory	% of population
NSW	89.8
Vic	75.3
Qld	4.7
WA	90.1
SA	90.2
Tas	94.7
ACT	100.0
NT	84.2

(a) Percentage of state/territory population living in areas with fluoride in public water supplies.

Fluoride from natural or engineering sources at concentrations of 0.7 parts per million or more (except SA and NT where concentration is 0.5 parts per million or more).

Source: AIHW Dental Statistics and Research Unit, unpublished data.

Microbiological risks from drinking water are mainly due to contamination by harmful micro-organisms from human or animal faeces. A broad range of viruses, bacteria and protozoa can be transmitted by contaminated water supplies. Disease outbreaks from public water supplies are rare in Australia, but they periodically occur from small private water supplies.

Chemical contaminants in water may arise from natural sources; for example, arsenic, nitrate or fluoride occurs in some groundwater supplies with particular geological characteristics. Other chemical contamination may result from human activities (for example, agricultural herbicides and pesticides in surface-water supplies). While national data are not available, results for New South Wales in 2003 indicate that almost 100% of drinking water samples met guidelines for permissible levels of inorganic chemicals and pesticides (Population Health Division 2004).

In some parts of Australia, drinking 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. While odour and flavour are impaired, health risks remain uncertain.

Managing the quality of drinking water requires multiple barriers to reduce potentially harmful contaminants to acceptable levels before water is supplied to consumers. 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. This multi-barrier approach was strengthened by the adoption of a national risk assessment and risk management framework as the central focus of the Australian Drinking Water Guidelines in 2004 (NHMRC 2004).

Although most Australians have access to good quality drinking water, the 2001 Community Housing and Infrastructure Needs Survey found that 56 of the 169 Indigenous communities (about 17,000 people) that had been tested had drinking water supplies that failed testing at least once in the 12 months before the survey (ABS 2002a).

Water-based recreation promotes healthy physical activity and enhances wellbeing, but may also expose participants to microbial (such as blue-green algae) or chemical contaminants. The quality of natural recreational water bodies may be affected by discharges of sewage, stormwater and agricultural runoff, while risks to swimming pool water quality arise from microbial contaminants originating from bathers themselves. Public swimming pools have been the source of a number of outbreaks of cryptosporidiosis in recent years in Australia.

Animal vectors and reservoirs of disease

The occurrence of vectorborne and zoonotic diseases (diseases that can be transmitted from animals to humans) diseases fluctuates considerably with patterns of human mobility, trade, weather, and the ecology of vector species such as mosquitoes and of reservoir species such as birds. Changes in the environment, weather and climate, but also mosquito control activities, influence the prevalence and geographic range of some mosquito-borne diseases within Australia. These include dengue (188 cases notified in Australia in 2004–05), Ross River virus disease (1,858), Barmah Forest virus disease (1,256) and, sometimes with more serious consequences, diseases caused by Murray Valley encephalitis (2 cases in 2004–05), Kunjin virus (4 cases) and Japanese encephalitis virus (no cases in 2004–05) (CDNA 2005).

Other infectious diseases can be spread by ticks and flies. Flies are also responsible for the spread of the eye disease trachoma in remote Indigenous communities. Mammals and birds act as natural reservoirs for a variety of pathogens that cause infectious diseases in humans. Since 2003, birds have acted as a reservoir for avian influenza ('bird flu'), which had caused 177 laboratory-confirmed cases in humans (including 98 deaths) worldwide by March 2006, mainly in Asia (WHO 2006). No cases had been recorded for Australia.

Providing information relevant to the risk of acquiring mosquito-borne disease, sentinel chicken surveillance is undertaken in New South Wales, Victoria, Queensland, Western Australia and the Northern Territory, to detect and provide early warning of activity of Murray Valley encephalitis virus and Kunjin virus. In addition, sentinel pig surveillance is conducted in Queensland (Cape York and the Torres Strait) to monitor Japanese encephalitis virus activity. Media warnings are issued when virus activity is detected, advising local residents of the need to take added precautions to avoid mosquito bites.

The sentinel flocks of chickens are tested for evidence of new infections throughout the year in some sites, and during summer months in others. In the 2004–05 season (in which there was no surveillance in Queensland), Murray Valley encephalitis virus activity was detected in the Top End of the Northern Territory and in the Kimberley in Western Australia; and Kunjin virus activity was detected in the Northern Territory. The sentinel pig surveillance detected Japanese encephalitis virus in the Torres Strait (CDNA 2005).

Air pollution

Air quality in Australia is relatively good by international standards (Manins et al. 2001) but requires regulation and continual monitoring. The air can be contaminated by pollutants, micro-organisms and odours, all of which can be harmful. The health effects of air pollutants range from mild respiratory symptoms through to asthma, cardiovascular conditions and premature mortality. Whereas older people are most at risk, the very young are also at risk (BTRE 2005). Lead exposure damages nerve function and can be a particular concern in the mental development of children.

Recent studies based in Brisbane, Sydney and Melbourne have found an association between air pollution levels and mortality and/or hospital admissions (EPA Victoria 2000, 2001; Morgan et al. 1998a, 1998b; Petroeschevsky et al. 2001; Simpson et al. 2005a, 2005b). A recent report estimated that motor vehicle pollution accounted for between 900 and 2,500 cases of cardiovascular disease, respiratory disease and bronchitis in 2000, and between 900 and 2,000 early deaths (BTRE 2005).

Ambient (that is, outdoor) air pollution in Australia is mainly caused by emissions from motor vehicles, heavy industry and mining activities. Air may also contain emissions from the combustion of fossil fuels for electricity generation, smoke from home heating and bushfires, and wind-blown dust. Indoor air may contain pollutants such as nitrogen dioxide from unflued gas heaters, volatile organic compounds from surface coatings and adhesives, moulds from moist surfaces, and tobacco smoke.

Environmental regulation has markedly reduced the ambient levels of sulfur dioxide, nitrogen dioxide, lead and carbon monoxide (BTRE 2005), and the concentration of lead in urban air has decreased substantially since unleaded fuels were introduced in the mid-1980s (Australian State of the Environment Committee 2001). However, levels of nitrogen oxides and of particulate matter with diameters of up to 10 microns (PM_{10}) are of ongoing policy concern, as are those with diameters less than 2.5 microns ($PM_{2.5}$), known to cause respiratory and cardiovascular illness.

Australia's National Environment Protection Council has established an Ambient Air Quality National Environment Protection Measure (NEPM), which includes air quality standards for nitrogen dioxide, PM_{10}, carbon monoxide, sulfur dioxide, photochemical oxidants (as ozone) and lead. Levels of these pollutants are regularly measured in a number of sites around Australia and reported in terms of the number of days per year when the average concentration exceeds the NEPM. Ozone is measured as an indicator of the amount of photochemical smog; it is not a directly emitted pollutant but is formed in a reaction between volatile organic compounds and nitrogen oxides under sunlight.

The number of days per year in which the concentration of PM_{10} exceeded the NEPM standard level of $50\mu g/m^3$ was generally higher in Sydney and Melbourne than in the other major capital cities during the period 2000–04 (Table 3.2). Perth was the only city which did not exceed the maximum allowable days of PM_{10}. Ozone concentrations exceeding 0.10 ppm were more frequent in Sydney than in the other major capital cities. No obvious trend of increase or decrease in ozone levels occurred for any of the capital cities during this period.

The concentration of lead in urban air has decreased substantially in Australia since unleaded fuels were introduced in the mid-1980s (Australian State of the Environment Committee 2001). However, the historical and ongoing accumulation of lead in smelting

Table 3.2: Days per year when concentrations of PM_{10} and ozone exceeded the ambient air quality NEPM standard levels, major capital cities, 2000–04

	2000	2001	2002	2003	2004
Number of days when concentration of PM_{10} exceeded $50\mu g/m^3$ (over 24 hours)[(a)]					
Sydney	2	5	17	10	2
Melbourne	0	2	6	13	11
Brisbane	0	1	7	2	2
Perth	0	1	2	1	1
Adelaide	n.a.	n.a.	1	6	4
Number of days when concentration of ozone exceeded 0.10 ppm (over 1 hour)[(b)]					
Sydney	4	9	2	4	7
Melbourne	1	0	0	2	1
Brisbane	0	0	2	0	0
Perth	0	0	0	0	1
Adelaide	n.a.	n.a.	0	0	0

(a) The maximum allowable number of days exceeding this level (50 micrograms per cubic metre) is five days per year, to be achieved by 2008.

(b) The maximum allowable number of days exceeding this level (0.1 parts per million) is one day per year, to be achieved by 2008.

n.a. Not available.

Sources: AIHW 2005a; NEPC 2005.

centres such as Port Pirie in South Australia and Broken Hill in New South Wales continues to pose health risks, particularly for children. These centres have been the focus of efforts to reduce childhood lead exposure and, over the past 20 years, there have been substantial exposure reductions, with recent exposures close to the exposure ranges observed in non-industrial settings before the removal of lead from petrol.

Built environments

The built environment consists of structures and spaces built or modified by people. These include houses, commercial and public buildings, parks and roads. Well-designed built environments can be beneficial to health and wellbeing by providing green spaces, shade and ventilation to reduce the urban 'heat island' effect in summer, safe roads, and bicycle and walking paths. Dwellings can be designed to minimise exposure to allergens, microbes, asbestos and physical hazards (including temperature extremes), and to reduce energy consumption.

Built environments may also contain physical hazards such as machinery and poor lighting in the workplace, and chemical hazards such as tobacco smoke and solvents. The use of gas cookers and unflued gas heaters can be a source of indoor air pollution, particularly in domestic dwellings.

Hazards may also be created by the design of the built environment. High-density living spaces, for example, create conditions favourable to the spread of infectious diseases. On the other hand, urban sprawl can encourage reliance on motor vehicle transport and deter physical activity. This contributes to traffic noise, air pollution and traffic accidents. Research from the United States has linked urban sprawl to obesity and high blood pressure (Ewing et al. 2003).

Environmental change, ecosystems and health

Environmental health research has traditionally focused on the health impacts of specific, usually localised, environmental exposures, such as those described above. In recent times, it has also developed a broader ecological approach that seeks to understand the population health effects of changes to the complex relationships between humans and their natural and social environments.

It is now widely recognised that human activities are having an increasing impact on many natural biophysical and ecological systems, including the global climate system (IPCC 2001; Millennium Ecosystem Assessment 2005). The resulting large-scale changes to the environment include:

- global warming
- extreme weather events
- depletion of stratospheric ozone
- deforestation
- land degradation
- loss of biodiversity
- rising sea levels
- depletion and contamination of fresh water.

In general, the effects on human health of these large-scale and complex environmental changes are difficult to measure or forecast. Meanwhile, there are growing concerns over this issue, especially in relation to climate change—and recognition that the accruing health risks extend into future decades. Although some effects may be beneficial (for example, land clearing can reduce habitats for disease-carrying animals and insects), most are expected to be harmful. More direct risks may include those from heatwaves, cyclones, floods and bushfires. Health may also be affected via less direct pathways, by changes in populations of pathogens, disease vectors, and non-human hosts and their interactions; by changes in aeroallergen production, and by changes in the agri-ecosystems that produce food. Disruption of social and economic conditions resulting from climate change could also have indirect consequences on health, both physical and mental (McMichael et al. 2006; Woodruff & McMichael 2004).

Australian temperatures have increased by about 0.9°C since 1910, consistent with global warming trends, and the trend is expected to continue over the decades ahead (Bureau of Meteorology 2006). It has been predicted that, between now and 2100, greenhouse gas accumulation will have increased the annual average temperature by between 1°C and 6°C over most of Australia, with significantly larger changes in some regions. One report has predicted that between 8,000 and 15,000 Australians could die every year from heat-related illnesses by 2100, compared with between 4,200 and 8,000 if global carbon dioxide emissions were reduced (Woodruff et al. 2005). That report also predicted that the geographical range of the mosquitoes that periodically transmit dengue in Queensland could extend from their current range in far northern Queensland, the Northern Territory and Western Australia to include coastal areas as far south as Sydney or Brisbane, depending on how much global emissions were reduced. This would place more of Australia's population at risk of dengue, and greater public health control efforts would be required to prevent transmission.

3.3 Socioeconomic characteristics

Health status is related to many socioeconomic factors, such as income and employment, and these factors are in turn associated with health. Because of the close associations and because the causal relationship can act in both directions, it is difficult to quantify the relationships. For example, those who are unemployed may be more likely to become ill because being without a job is bad for health, but at the same time those who become ill may be more likely to become unemployed or leave the labour force (the health selection effect). In such cases it is not always clear which came first, the illness or the unemployment. Also not clear is the extent to which it is the lower incomes resulting from unemployment that lead to poorer health and how much is it the unemployment itself.

This section describes some of the most important relationships and details the direction in which socioeconomic factors have been moving in the last decade or so. Further information about the association between health and socioeconomic status is in Chapter 4.

Socioeconomic characteristics that influence health include education, income, wealth, occupation, marital and family status, labour force participation, housing, ethnic origin and characteristics of the area of residence.

Education

Education is an important determinant of health, both in its own right and through its link to income and employment. Education provides knowledge and skills so that individuals can improve their own health and access appropriate health services (Adler & Newman 2002). Two important population-level measures of education are the Year 12 retention rate and educational attainment for the whole population (ABS 2003c).

Retention in education until Year 12 is becoming increasingly important for young people. Retention rates increased rapidly during the 1980s to a peak in 1992, with slight decreases in recent years. In 1980, 32% of males and 37% of females completed Year 12 (AIHW 2005a), compared with 73% and 82% in 1992 (ABS 2001). In 2004, 70% of males completed Year 12, as did 81% of females, and 40% of Indigenous young people (ABS 2006a).

Overall educational attainment continues to increase. In 2004, 21.9% of the population aged 25–64 had a bachelor degree or above, compared with 13.4% in 1994. Among this group, a diploma or other post-secondary educational qualification was held by 34.7% in 2004 compared with 30.8% in 1994. Overall, there was an increase in the proportion of people with post-secondary qualifications, from 44% in 1994 to 57% in 2004 (ABS 2006a).

Income

There is much debate about the relationship between income, wealth and health and, in particular, whether health status is associated with the inequality of income and wealth in a society or whether it is only the absolute level of income and wealth that is relevant.

Some research indicates that there is no strong evidence that countries or regions with higher levels of income inequality (disparity between high and low incomes) had worse health status than those with lower levels of income inequality (Lynch & Smith 2002; Mackenbach 2002; Mackenbach & Howden-Chapman 2003; Pearce & Davey Smith 2003). However, some still argue for a link between health status and income inequality, at least in the United States of America (Marmot 1999, 2002; Wilkinson & Marmot 2003).

Although the evidence for a link between income inequalities and health in high-income countries is not strong, income itself has been shown to relate strongly to health, especially in lower income countries. Higher incomes can enable the purchase of health-related goods and services such as better food, housing, recreation and health care, and may provide psychological benefits such as a greater sense of control.

In Australia, 19% of the mortality burden for males and 12% for females has been associated with socioeconomic disadvantage (AIHW: Mathers et al. 1999). That is, if all Australians had the same death rates as people living in the most socioeconomically advantaged fifth of areas and regions, then overall mortality rates would reduce by 19% for males and 12% for females.

Real national disposable income per person rose by 25% between 1996–97 and 2004–05 (ABS 2006b) and now stands at $35,106. The ABS Income and Housing Survey shows increases of 25% for the lowest income quintile (fifth) in real household equivalent income over the period 1994–95 to 2003–04, 19% for the highest income quintile, and 20% for households overall (ABS 2006c). Thus, inequality of income has reduced somewhat in this period.

Employment status and occupation

There is unquestionably a link between unemployment and health status. The unemployed have a higher chance of dying and more illnesses than those of similar age who are employed. For some, unemployment has been caused by illness but for many it is unemployment that causes the health problems.

In the late 1980s, mortality was estimated to be 50% higher in the unemployed than in the employed in Australia (Mathers 1994). In the New Zealand Census mortality study, males 25–64 years who were unemployed in 1991 had a 44% higher chance of dying within three years than males who were in full-time employment. Rates of suicide, lung cancer and cardiovascular disease were particularly elevated for those who were unemployed (Blakely 2002). The UK linked census study also shows a strong relationship between unemployment and the chance of dying. Those unemployed at any census between 1971 and 1991 had a 22% higher chance of dying in the period 1995 to 2001 (White et al. 2005). Because this study followed people over time, it was able to partly answer the question of the direction of cause. It concluded that unemployment directly increased the chance of dying, and it was not just that unemployed people were sicker in the first place.

There is also extensive evidence of an association between occupation and mortality both overseas and in Australia (Draper et al. 2004). This evidence typically shows that persons employed in manual occupations have higher mortality rates for most causes of death than those employed in clerical or managerial/professional occupations. These differences may relate both to the lower socioeconomic status of manual workers, as a group, and their increased risk of exposure to injury and other occupational hazards.

At the end of 2005, 61.0% of the Australian adult civilian population were employed. A further 3.0% were unemployed (giving an unemployment rate of 4.7%) and 36.0% were not in the labour force (Table 3.3). Of employed females, just over half were in full-time employment, compared with 85% of employed males.

Table 3.3: Labour force status of persons aged 15 years and over, November 2005 (per cent)

Labour force status	Males	Females	Persons
In the labour force			
Employed			
Full time	58.2	29.2	43.5
Part time	9.8	25.0	17.5
Total employed	*68.1*	*54.2*	*61.0*
Unemployed			
Looking for full-time work	2.8	1.6	2.2
Other	0.6	1.0	0.8
Total unemployed	*3.4*	*2.6*	*3.0*
Total in the labour force	71.5	56.8	64.0
Not in the labour force	28.5	43.2	36.0
Total population ('000)[(a)]	8,080.0	8,334.8	16,414.8

(a) Total civilian population aged 15 years or over.

Source: ABS 2005b.

The occupation of employed persons is recorded in the population Census (last conducted in 2001) and also in the ABS monthly labour force survey. In Australia, occupation is classified by the Australian Standard Classification of Occupations, which at its highest level has nine broad groups. These are traditionally further grouped into three categories: professional, 'white-collar' and 'blue-collar' (Table 3.4).

In the total employed population in late 2005, professional occupations comprised the largest group (39.7%), and there was very little difference in this proportion between males and females. Although for all persons the white-collar and blue-collar groups were of similar size, females accounted for the bulk of white-collar occupations, with the opposite the case for blue-collar occupations. Analysis of the Census data indicates that with increasing age there is generally a shift in the profile towards the professional occupation groups.

Table 3.4: Occupation of employed persons aged 15 years and over, November 2005 (per cent)

Occupation group	Males	Females	Persons
Professional			
Managers and administrators	10.6	5.3	8.2
Professionals	17.2	21.5	19.1
Associate professionals	12.6	12.0	12.3
Total professional	*40.4*	*38.8*	*39.7*
White-collar			
Advanced clerical and service workers	0.9	8.0	4.1
Intermediate clerical, sales and service workers	8.4	26.4	16.6
Elementary clerical, sales and service workers	6.2	14.9	10.2
Total white-collar	*15.6*	*49.3*	*30.8*
Blue-collar			
Tradespersons and related workers	20.8	2.8	12.7
Intermediate production and transport workers	13.0	2.3	8.2
Labourers and related workers	10.3	6.8	8.7
Total blue-collar	*44.1*	*11.9*	*29.5*
Total employed persons ('000)	5,499.4	4,517.6	10,017.0

Source: ABS 2005c.

Marital and family status

Children in single-parent families have poorer health than children in two-parent families (Mathers 1995). However, this seems to be due to single-parent families having lower average income and more unemployment than two-parent families, not to the family structure in itself (Mathers 1995; National Health Strategy 1992). The proportion of families with dependent children that are one-parent families has increased fairly consistently between 1976 and 2001: from 12% to 22% (AIHW 2005a).

3.4 Knowledge, attitudes and beliefs

Among the many factors that influence an individual's health are their knowledge, attitudes and beliefs about lifestyle behaviours, help-seeking behaviours, and other health decisions. A range of theories aim to explain the relationship between cognitive states and behaviour (or behaviour change), which can be distilled to a handful of key factors, including:

- an individual's behaviour intention
- environmental constraints
- skill or ability
- anticipated outcome of a given behaviour
- other supporting factors such as self-standards and self-efficacy.

Many Australian studies have documented attitudes and perceptions on diet, use of tobacco, alcohol and illicit substances, physical activity, childhood immunisation, and various other issues. Selected recent findings are summarised here to illustrate the various information available.

Respondents to the 2004 National Drug Strategy Household Survey (NDSHS) were asked for their thoughts on the health effects of tobacco smoke on non-smokers. Around 9 in 10 non-smokers thought that living with or working/socialising with smokers would affect a non-smoker's health, compared with 7 in 10 smokers (Table 3.5).

Table 3.5: Smokers' and non-smokers' perceptions of the effects of tobacco smoke on non-smokers, 2004 (per cent)

Situation/perception	Non-smokers[(a)]	Smokers[(b)]	All
Live with smokers			
Yes, might be affected	92.2	72.9	88.2
No, might not be affected	3.7	14.4	5.9
Don't know	4.1	12.7	5.9
Work or socialise with smokers			
Yes, might be affected	89.5	66.9	84.8
No, might not be affected	5.0	18.6	7.8
Don't know	5.5	14.5	7.4

(a) Never or ex-smoker.

(b) Daily, weekly or less-than-weekly smoker.

Source: AIHW 2005b.

The Australian Study of Health and Relationships showed that knowledge of the transmission routes and health consequences of the most common sexually transmitted infections (in particular gonorrhoea, genital warts and chlamydia) was poor. Individuals with the best knowledge were those who identified as homosexual or bisexual and those with a history of a sexually transmitted infection. Females were found to have significantly more knowledge about sexually transmitted infections than men. Higher educational and occupational status among both males and females were associated with better knowledge (Grulich et al. 2003a).

In the area of physical activity, Gill & Taylor (2004) reported on the impact of perceived body image on being more physically active: around 15% of respondents said that the way they felt about their body shape prevented them from being more physically active, with the majority (82%) saying that their body image perception did not affect their physical activity behaviours.

As an example of the role of knowledge, attitudes and beliefs in health behaviours, Rickwood and others (2005) studied the factors that affect help-seeking for mental health problems among young people. The researchers found that negative attitudes towards professional help were a major barrier in help-seeking. Other barriers included fear of stigma relating to mental health problems, and fear about the confidentiality of professional services. On the other hand, positive attitudes towards professionals (engendered by previous positive experiences) promoted help-seeking behaviour. Another positive impact was mental health 'literacy', including knowledge of symptoms and when to get help, knowledge of available services, and knowledge of what to expect from different types of services.

3.5 Health behaviours

Behavioural determinants of health that accounted for the greatest burden of disease in Australia in 2003 included tobacco smoking, physical activity, alcohol consumption, use of illicit drugs, lack of fruit and vegetables, and unsafe sex. This section provides information on the prevalence of these determinants, as well as of other determinants such as adult vaccination.

Tobacco smoking

Impact and prevalence

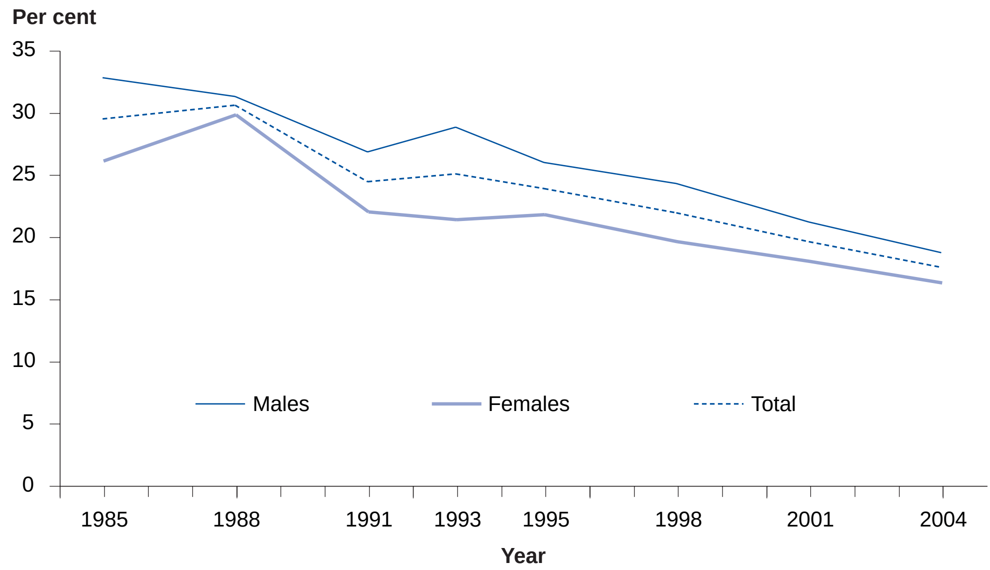
Tobacco smoking contributes to more drug-related hospitalisations and deaths than alcohol and illicit drug use combined. It is a major risk factor for coronary heart disease, stroke, peripheral vascular disease, cancer and a variety of other diseases and conditions.

Tobacco smoking is responsible for 7.9% of the burden on the health of Australians: around 9.5% of the total burden of disease in males and 6% in females (provisional estimate at the time of writing) (see Table 3.1). Globally, the World Health Organization (WHO) estimates that tobacco causes 8.8% of deaths (4.9 million) and 4.1% of the total burden of disease (WHO 2002).

The tangible social costs of tobacco use in Australia were estimated to be $7.6 billion in 1998–99, or about 2.3% of gross domestic product (Collins & Lapsley 2002).

Estimates from the 2004 NDSHS indicate that around 2.9 million Australians (17.4% of people aged 14 years and over) smoked tobacco daily. Males were more likely to be daily smokers (18.6%) than females (16.3%). Former smokers comprised 26.4% of the population (29.2% of males and 23.6% of females) and 52.9% had never smoked (48.2% of males and 57.5% of females).

In Australia, smoking rates have been declining since the 1950s, when it was estimated that around 70% of males and 30% of females smoked. Between 1995 and 2004, the prevalence of smoking for males and females declined by 7.3 and 5.5 percentage points, respectively (Figure 3.2).



Source: AIHW 2005b.

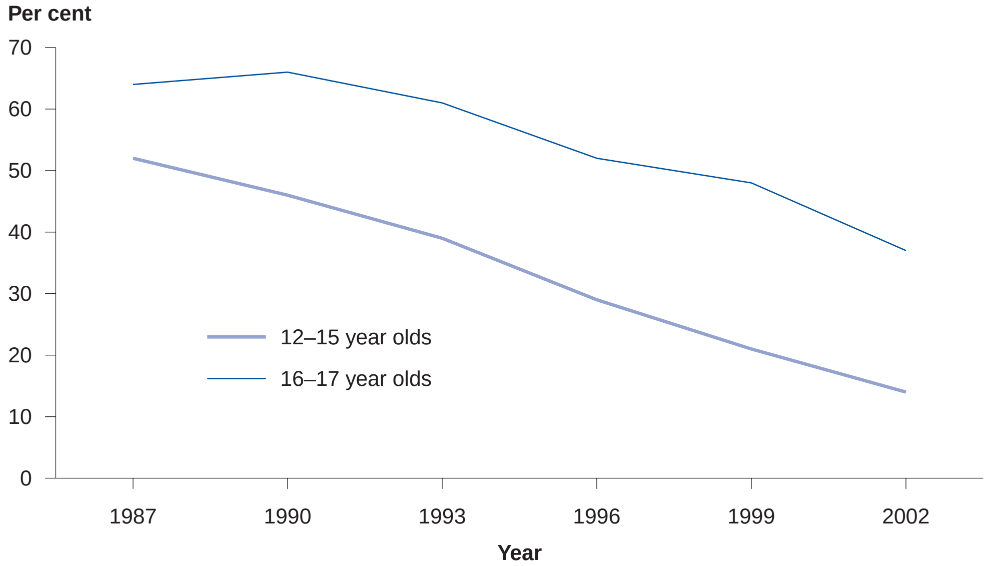
Figure 3.2: Daily smokers, population aged 14 years or over, 1985–2004

Smoking among young people

The ability of teenagers to purchase cigarettes increases the likelihood of smoking. In response, all states and territories in Australia have enacted 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 those aged 12–15 years who were current smokers and had purchased their most recent cigarette (instead of acquiring it in some other way) declined from 52% in 1987 to 14% in 2002, while for those aged 16–17 the decline was from 64% to 37% (Figure 3.3).

In the 2004 NDSHS, about one in 12 persons aged 12–19 years reported smoking daily in 2004. Rates were under 3% for those aged 12–15 years and markedly higher for those aged 16 years and over, particularly for females aged 16–17 years (Table 3.6). About 96% of the 12–15 years age group reported having never smoked a full cigarette; about the same for both males and females. Estimates of tobacco use by younger people should be interpreted with caution because of the low prevalence and relatively smaller sample sizes compared with those for adults.



Source: White & Hayman 2004.

Figure 3.3: Teenage smokers who purchased their most recent cigarette, 1987–2002

Table 3.6: Daily smokers: proportions among those aged 12–19 years, 2004 (per cent)

	Age group			
Sex	**12–15**	**16–17**	**18–19**	**12–19**
Males	2.0	7.5	17.5	7.3
Females	2.6	14.5	16.3	9.1
Persons	**2.3**	**10.9**	**16.9**	**8.1**

Source: AIHW 2005c.

Children exposed to tobacco smoke in the home

Children are particularly susceptible to the effects of environmental tobacco smoke. Passive smoking causes lower respiratory infections, middle ear infections, onset and worsening of asthma, decreased lung function, eye and nose irritation, low birthweight and sudden infant death syndrome in children (National Drug Strategy 2002; NHMRC 1997).

The benefits of reducing children's exposure to environmental tobacco smoke at home also include reduced school absenteeism, increased school performance, reduced uptake of smoking and lower consumption of tobacco among children who smoke (National Drug Strategy 2002).

Over the period 1995–2004, around one-third of all households included dependent children (that is, children aged 14 years and under). In 1995, around 31% of these households included someone who smoked inside the home (Table 3.7). With the general decline in smoking prevalence, this figure fell to less than 12.3% of households in 2004, or just over 600,000 dependent children exposed to tobacco smoke inside the home.

Table 3.7: Household smoking status[(a)], by dependent children status[(b)], 1995–2004 (per cent)

	Dependent children				No dependent children[(c)]			
Household smoking status	**1995**	**1998**	**2001**	**2004**	**1995**	**1998**	**2001**	**2004**
Smokes inside the home	31.3	22.6	19.7	12.3	32.2	26.6	21.3	17.4
Only smokes outside the home	16.7	21.5	24.9	28.1	13.7	18.0	19.8	17.6
No-one at home regularly smokes	52.0	55.9	55.4	59.6	54.1	55.4	58.9	65.0

(a) Household smoking status as reported by respondents aged 14 years or over.

(b) Households including dependent children aged 14 years or under.

(c) Includes dependents aged 15 years and over.

Source: AIHW analysis of National Drug Strategy Household Surveys 1995–2004.

International comparisons

The prevalence of daily smoking varies considerably among OECD countries, ranging from about one in three of the adult population in the Netherlands and Hungary, to less than one in five in the United States of America, Canada, Sweden and Australia (Table 3.8).

Table 3.8: Prevalence of daily smoking, population aged 15 years or over, selected OECD countries, 1974–2004[(a)]

Country	1974	1984	1994	2004
Netherlands	53.0	39.0	37.0	34.0
Hungary	n.a.	35.2	35.5	33.8
Luxembourg	n.a.	33.0	33.0	33.0
Korea	n.a.	n.a.	34.7	30.4
Japan	47.8	39.8	36.9	30.3
France	n.a.	30.0	28.0	28.6
Denmark	55.0	47.0	37.0	28.0
Ireland	45.6	34.5	28.0	27.0
Belgium	n.a.	36.0	26.0	27.0
Norway	42.0	38.0	33.0	26.0
United Kingdom	45.0	34.0	27.0	26.0
New Zealand	36.0	32.0	27.0	25.0
Germany	n.a.	n.a.	22.9	24.3
Italy	n.a.	31.7	25.4	24.2
Czech Republic	n.a.	n.a.	26.1	24.1
Finland	n.a.	24.6	22.7	22.2
Iceland	n.a.	33.0	26.9	20.2
Australia	**37.8**	**35.4**	**24.1**	**17.7**
Sweden	n.a.	30.5	22.7	17.5
United States	37.1	32.1	21.0	17.5
Canada	39.0	31.2	25.5	17.0

(a) Data are for the year specified, or one to three years earlier or later.

n.a. Not available.

Sources: OECD Health Data 2005; National Drug Strategy Household Survey 2004.

With few exceptions, the countries included in Table 3.8 saw a decline in the prevalence of daily smoking between 1974 and 2004, with major reductions in the early part of this period and a slowing of the decline in the last decade. The decline in smoking rates in Australia over the past three decades has resulted in Australia having the fourth lowest daily smoking prevalence (17.7%) of the OECD countries in Table 3.9, behind Canada (17.0%), the United States (17.5%), and Sweden (17.5%).

Physical activity

Physical activity is important in maintaining good health. Regular physical activity reduces cardiovascular risk in its own right and also improves levels of cardiovascular risk factors such as overweight, high blood pressure, low levels of HDL (the 'good' cholesterol) and Type 2 diabetes. It helps protect against 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).

National guidelines have set out the amount of physical activity that Australians should take if they are to gain health benefits (Box 3.2). Compared against these guidelines, a significant majority of Australians are not physically active enough. People who have lower-than-recommended levels of physical activity have an increased risk of mortality and morbidity from a range of diseases and conditions. Low levels of physical activity have been estimated (provisionally, at the time of writing) to have accounted for 6.7% of the burden of disease and injury in Australia in 2003 (see Table 3.1).

Box 3.2: What is sufficient physical activity for health?

The National Physical Activity Guidelines for Australians (AIHW 2003; DHAC 1999; DoHA 2004a, 2004b) recommend at least 30 minutes of moderate-intensity physical activity on most, preferably all, days of the week to obtain health benefits. This is generally interpreted as 30 minutes on at least five days of the week, a total of at least 150 minutes of moderate activity per week. The guidelines for children and adolescents 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.

There are two ways of calculating 'sufficient' activity for health based on the Australian Guidelines. 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). For population-monitoring purposes, sufficient time and sessions is the preferred measure of sufficient activity for health as it takes into account the frequency as well as duration of physical activity. 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.

Individuals' reductions in physical activity in recent decades may be partly due to the 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 apparent 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 (Bauman et al. 2002).

Prevalence and trends

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. Most of the information presented here is based on data obtained from the 1997, 1999 and 2000 National Physical Activity Surveys (NPASs). This series 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 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 domestic activity, also contributes to overall physical activity. However, this component of physical activity is difficult to measure, and the instruments used to measure it are not generally practical for use in population surveys.

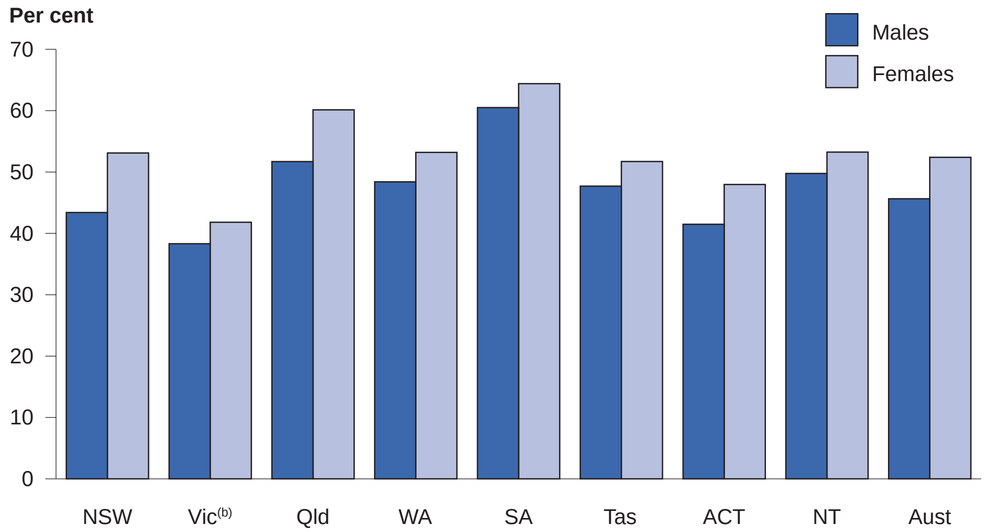
Here, 'sufficient time and sessions' (see Box 3.2) is used as the measure of 'sufficient' physical activity for health. 'Insufficient physical activity' is the completion of some physical activity but either not enough in total or not in sufficient sessions to meet the 'sufficient time and sessions' recommendations.

Estimates from the 2004 state and territory CATI surveys suggest that around 50% of adults are not undertaking sufficient physical activity (Figure 3.4). Females reported higher levels of inactivity than males in all states and territories.

Data from the 2000 NPAS showed that rates of insufficient physical activity were highest among those aged 30–59 years and lowest among those aged 18–29 years, for both males and females (Figure 3.5). The proportion in the survey reporting no physical activity over the previous week increased with age, from about 11% of males and 9% of females aged 18–29 years to 20% of males and 17% of females aged 45 years or over.

Available data suggest little change in physical activity patterns during the 1980s and much of the 1990s in Australia. However, between 1997 and 2000 the estimated proportion of Australians with lower-than-recommended levels of physical activity rose from 49% to 54%. During this period, the prevalence of insufficient levels of physical activity increased among males and females and for all age groups under 60 years. The proportion of males in the NPAS reporting no physical activity also increased, from 14% in 1997 to 18% in 2000.

Data from the 1995, 2001 and 2004–05 National Health Surveys (NHSs) also suggest little change in physical activity patterns, with the proportion of people aged 18 years or more reporting sedentary levels of physical activity (that is, less than 100 minutes of exercise over two weeks) remaining around 30–35% (ABS 2006d).



(a) Persons not exercising for 150 minutes per week and not exercising for five sessions per week.

(b) Reported results have been adjusted for missing values.

Sources: NSW Population Health Survey, unpublished data; AIHW analysis of Vic Population Health Survey (DHS 2004); WA Health and Wellbeing Surveillance System, unpublished data; SA Monitoring and Surveillance System, unpublished data; AIHW analysis of 'Filling the gaps in data pooling' survey (December 2004).

Figure 3.4: Insufficient physical activity [(a)], persons aged 18 years and over, 2004

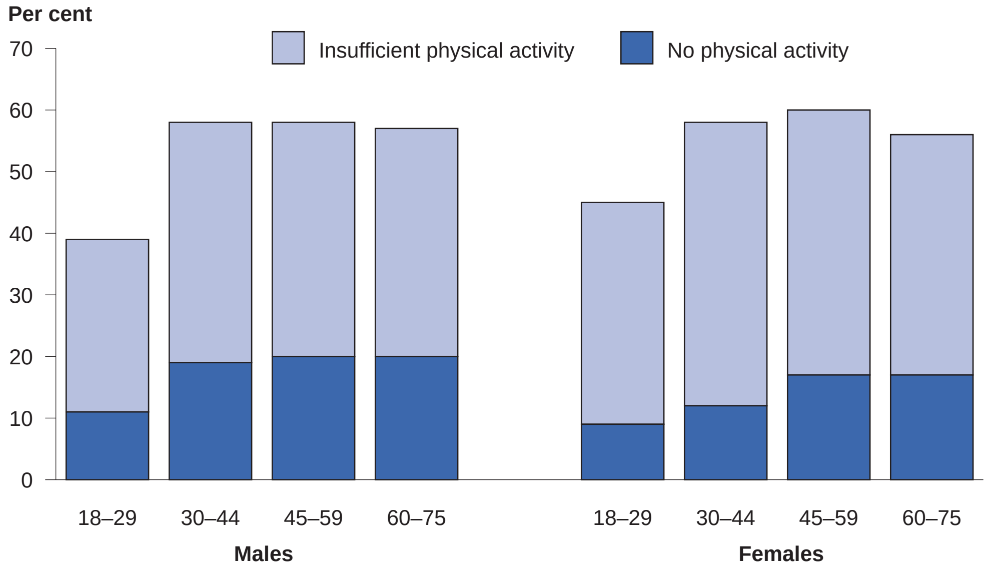
Older Australians

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 NPAS findings indicate that the level of physical activity reported by older Australians (those aged 60–74 years) is remaining stable. The findings for 2000 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' (AIHW analysis of the 2000 NPAS).

Children and adolescents

There are no recent national data on the physical activity levels of Australian children and adolescents. In a survey conducted recently in New South Wales, three-quarters of the students in Years 6, 8 and 10 reported levels of physical activity that met the recommendations (see Box 3.2). Boys reported more activity than girls, but for both sexes participation decreased with age (Booth et al. 2006). An earlier survey conducted in Western Australia (Hands et al. 2004) found that one-quarter of high school males surveyed, one-third of high school females and one out of seven primary school students reported doing no sport, exercise or dance activities in a typical week.



Notes

1. Age-standardised to the Australian population as at 30 June 2001.
2. People aged 18–75 years.
3. Insufficient physical activity is less than 150 minutes and/or less than five sessions in the previous week.

Source: AIHW analysis of the 2000 National Physical Activity Survey.

Figure 3.5: Proportion of adults undertaking insufficient or no physical activity, 2000

Alcohol consumption

Excessive alcohol consumption is a major risk factor for morbidity and mortality. The WHO 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 (provisionally, at the time of writing) that harm from alcohol was the cause of 5.3% of the burden of disease for males and 2.2% for females (see Table 3.1).

There are also social costs to the consumption of alcohol. In Australia in 1998–99, the total tangible cost attributed to alcohol consumption (which includes lost productivity, health care costs, road accident-related costs and crime-related costs) was estimated at $5.5 billion (Collins & Lapsley 2002).

Nevertheless, some benefits are thought to arise in the longer term from low to moderate alcohol consumption, largely through reduced risk of stroke and ischaemic heart disease. The net harm associated with alcohol consumption, after taking into account these benefits, was around 2.0% of the total burden of disease in Australia in 2003.

Alcohol consumption patterns

Analysis of the NDSHS from 1993 to 2004 shows that four in five Australians drank alcohol, and one in ten did so daily (Table 3.9). In 2004, 83.6% of Australians aged 14 years or over were current drinkers. These rates have been fairly stable since 1993.

Table 3.9: Alcohol drinking status, population aged 14 years and over, 1993–2004 (per cent)

Drinking status	1993	1995	1998	2001	2004
Daily	8.5	8.8	8.5	8.3	8.9
Weekly	39.9	35.2	40.1	39.5	41.2
Less than weekly	29.5	34.3	31.9	34.6	33.5
Ex-drinker[(a)]	9.0	9.5	10.0	8.0	7.1
Never a full serve of alcohol	13.0	12.2	9.4	9.6	9.3

(a) Ex-drinkers are those who consumed at least a full serve of alcohol in their lives, but not in the last 12 months.

Source: AIHW 2005c.

International comparisons

The pattern of change over time in per person alcohol consumption varied among the OECD countries (Table 3.10). For the majority, including Australia, there appears to have been a peak of consumption in the 1970s and 1980s with a tapering off in 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, while Portugal and Italy had a considerable decrease throughout the period.

Table 3.10: Alcohol consumption, population aged 15 years and over, selected OECD countries, 1963–2003[(a)] (litres of pure alcohol per person per year)

Country	1963	1973	1983	1993	2003
Luxembourg	10.4	12.7	12.4	15.3	14.9
Ireland	5.2	8.2	8.0	11.2	14.3
Hungary	8.6	11.9	14.5	13.1	13.4
Portugal	19.6	16.8	17.8	15.0	13.0
Czech Republic	n.a.	n.a.	12.2	11.5	11.9
Spain	14.5	19.0	17.0	12.0	11.7
Austria	12.0	16.1	12.6	12.3	11.3
Denmark	5.9	10.9	12.8	11.7	11.2
United Kingdom	6.1	8.7	9.1	9.3	11.1
Switzerland	13.1	15.0	13.6	12.1	10.8
France	n.a.	17.2	15.1	11.5	10.5
Germany	10.2	14.8	14.3	11.2	10.4
Belgium	9.6	13.3	13.8	11.7	10.2
Australia	9.8	13.0	12.3	10.0	9.8
Finland	3.1	7.4	7.9	8.4	9.2
New Zealand	5.8	11.3	10.6	9.6	9.2
Italy	16.6	15.3	12.6	10.2	8.7
United States	8.1	9.9	10.2	8.4	8.3
Japan	5.9	7.6	8.6	8.8	8.2
Canada	7.4	10.3	10.9	7.5	7.8
Sweden	5.1	7.0	6.1	6.2	7.0
Turkey	0.8	1.6	1.6	1.6	1.5

(a) Data are for the year specified, or one to three years earlier or later.

Sources: ABS 2004; OECD Health Data 2004.

Risk of harm from alcohol consumption

In 2001 the National Health and Medical Research Council (NHMRC) published alcohol consumption guidelines for males and females. They are expressed in terms of short-term and long-term risk of injury, ill health and death. An overview of the principal guidelines is in Box 3.3.

> **Box 3.3: Australian alcohol guidelines for short-term and long-term patterns of drinking—summary**
>
> *Males who consume no more than four standard drinks a day on average or no more than 28 drinks in a week avoid the long-term risk of ill health and death related to alcohol and maximise the potential long-term health benefits.*
>
> *The equivalent amounts for females are two standard drinks per day on average and 14 over a week (because of their lower average body mass and the different way their bodies process alcohol).*
>
> *Males who consume more than six standard drinks in any one day significantly increase the short-term risk of health and social problems, including (but not only) risk of injury or death from accident, assault and self-harm.*
>
> *For females the equivalent limit is four standard drinks.*
>
> *Source:* NHMRC 2001.

In 2004, one in six (16.4%) Australians aged 14 years or over had not consumed alcohol in the previous 12 months. Three in five (61.4%) Australians had drunk at levels considered low risk for harm in the short and long term, and one in twelve (8.3%) had drunk at levels considered risky or high risk for both short-term and long-term harm (Table 3.11).

Alcohol use and psychological distress

The Kessler 10 scale (K10) 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 four-week period. Analysis of psychological distress by alcohol use patterns for persons aged 18 years or over in Australia in 2004 shows that high-risk (15.6%) and risky (11.4%) drinkers were more likely than low-risk drinkers (8.6%) or abstainers (9.9%) to experience high or very high levels of psychological distress (AIHW 2005c). The psychological distress may have preceded the alcohol use for some and, for others, alcohol use may have preceded the psychological distress.

Use of illicit drugs

Illicit drug use refers to the use of drugs such as marijuana, heroin, ecstasy and cocaine (which are illegal to possess); the use of volatile substances such as glue, solvent and petrol as inhalants; or 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

Table 3.11: Risk of harm from alcohol, population aged 14 years or over, 2004 (per cent)

		Short-term risk[a]		
Long-term risk	Abstainer	Low risk	Risky or high risk	Total
Males				
Abstainer	12.9	. .	. .	12.9
Low risk	. .	61.5	15.5	77.0
Risky or high risk	. .	1.5	8.7	10.1
Total	*12.9*	*63.0*	*24.2*	*100.0*
Females				
Abstainer	19.8	. .	. .	19.8
Low risk	. .	61.2	9.4	70.6
Risky or high risk	. .	1.7	7.9	9.6
Total	*19.8*	*62.9*	*17.3*	*100.0*
Persons				
Abstainer	16.4	. .	. .	16.4
Low risk	. .	61.4	12.4	73.7
Risky or high risk	. .	1.6	8.3	9.9
Total	**16.4**	**62.9**	**20.7**	**100.0**

(a) Monthly basis.

Note: For description of long- and short-term risk see Box 3.3.

Source: AIHW 2005d.

(inflammation of the lining of the heart), poisoning, mental illness, suicide, self-inflicted injury and overdose. Globally, the WHO estimates that 0.4% of deaths (0.2 million) and 0.8% of the total burden of disease are attributable to illicit drug use (WHO 2002). In Australia in 2003, it is estimated (provisionally, at the time of writing) that 1.9% of the burden of disease was attributable to use of illicit drugs (see Table 3.1).

Trends in recent illicit drug use

From the NDSHS, around 15% of the Australian population aged 14 years or over used illicit drugs in 2004 (Table 3.12); there were decreases for each type of drug with few exceptions (AIHW 2005c). Marijuana/cannabis, at 11.3%, was the recently used illicit drug most commonly reported by this population—a decline from rates of around 13% in most survey years between 1993 and 2001. Ecstasy was the second most common, with use by an estimated 3.4%, for the first time being more prevalent than amphetamines (mainly methamphetamines) at 3.2%.

Young people's use of illicit drugs

The 2004 NDSHS was expanded from previous surveys so it covered persons aged 12 years and over, revealing that 7.6% of the population aged 12–15 years had used an illicit drug in the previous year. Illicit drug use was more common for young people aged 16–17 years (20.9%), and even more common for those aged 18–19 years (30.8%).

Most illicit drug use in the 12–15 years age group was of marijuana/cannabis (5.2%), followed by the non-medical use of pain-killers (2.0%). For all other substances surveyed the prevalence in this age group was less than 1%.

Table 3.12: Summary of recent[(a)] illicit drug use; population aged 14 years and over, 1993–2004 (per cent)

Substance/behaviour	1993	1995	1998	2001	2004
Marijuana/cannabis	12.7	13.1	17.9	12.9	11.3
Pain-killers/analgesics[(b)]	1.7	3.5	5.2	3.1	3.1
Tranquillisers/sleeping pills[(b)]	0.9	0.6	3.0	1.1	1.0
Steroids[(b)]	0.3	0.2	0.2	0.2	0
Barbiturates[(b)]	0.4	0.2	0.3	0.2	0.2
Inhalants	0.6	0.6	0.9	0.4	0.4
Heroin	0.2	0.4	0.8	0.2	0.2
Methadone[(c)]	n.a.	n.a.	0.2	0.1	0.1
Other opiates/opioids[(b)]	n.a.	n.a.	n.a.	0.3	0.2
Meth/amphetamine (speed)[(b)]	2.0	2.1	3.7	3.4	3.2
Cocaine	0.5	1.0	1.4	1.3	1.0
Hallucinogens	1.3	1.8	3.0	1.1	0.7
Ecstasy[(d)]	1.2	0.9	2.4	2.9	3.4
Ketamine	n.a.	n.a.	n.a.	n.a.	0.3
GHB[(e)]	n.a.	n.a.	n.a.	n.a.	0.1
Injected drugs	0.5	0.6	0.8	0.6	0.4
Any illicit drug	14.0	17.0	22.0	16.9	15.3
None of the above	86.0	83.0	78.0	83.1	84.7

(a) Used in last 12 months.

(b) For non-medical purposes.

(c) For non-maintenance purposes.

(d) This category included substances known as 'designer drugs' prior to 2004.

(e) Gamma-hydroxybutyrate.

Source: AIHW 2005c.

Illicit drug use and psychological distress

Illicit drug use can be associated with a range of mental illnesses, and there has been some recent debate about the relationship between heavy cannabis use and psychosis.

The 2004 NDSHS included the K10 scale of psychological distress, a module that measures non-specific psychological distress and relates to the level of anxiety and depressive symptoms a person may have had over the previous four weeks.

Among the general community (aged 18 years or over), less than one in 10 experienced high or very high levels of distress (Table 3.13). However, 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. The psychological distress may have preceded the drug use for some and, for others, the drug use may have preceded the psychological distress.

Table 3.13: Psychological distress,[(a)] by use of selected illicit drugs, persons aged 18 years or over, 2004 (per cent)

	Level of psychological distress		
Substance/behaviour	Low	Moderate	High and very high
All persons (18+)	68.4	21.8	9.8
Any illicit drug			
Used in the last month	50.1	30.4	19.6
Not used in the last month	70.4	20.9	8.8
Marijuana/cannabis			
Used in the last month	49.8	31.0	19.2
Not used in the last month	69.8	21.1	9.1
Heroin			
Used in the last month	9.9	25.2	64.9
Not used in the last month	68.5	21.7	9.8
Meth/amphetamines			
Used in the last month	36.1	32.8	31.1
Not used in the last month	68.8	21.6	9.5
Ecstasy			
Used in the last month	44.5	33.9	21.6
Not used in the last month	68.8	21.6	9.7

(a) Using the Kessler 10 scale of psychological distress.

Source: 2004 National Drug Strategy Household Survey.

Injecting drug use

As noted above, injecting drug use is a significant risk factor for transmitting bloodborne viruses such as HIV and HCV: in 2004 around 4% of new HIV infections and 70% of hepatitis C infections were attributed to injecting drug use (NCHECR 2005a).

Further, there is a strong association between the length of injecting and the prevalence of HCV. A 2004 survey of injecting drug users showed that 73% of people with a history of injecting drug use for 10 years or more tested positive to HCV antibody, compared with 25% of people with a history of injecting drug use of less than three years (Table 3.14). Such a relationship does not appear for HIV; however, only 1% of the injecting drug users assessed tested positive for HIV antibody.

The proportion of injecting drug users at needle and syringe programs reporting re-use of someone else's used needle and syringe in the previous month, in the national annual Needle and Syringe Program cross-sectional survey, decreased nationally from 17% in 2000 to 13% in 2003, then increased to 18% in 2004 (NCHECR 2005b). From 2000 to 2002, survey respondents aged less than 20 years were more likely than older age groups to report sharing needles and syringes in the previous month, but this difference was not observed in 2003 and 2004.

Re-use of someone else's needle and syringe was generally reported as after use by only one person (9% to 13% of all participants), typically a regular sex partner (7–9%) or close friend (4–5%). Re-use of someone else's used equipment other than needles and syringes in the previous month remained stable in the period 2000–04, except for the proportion of survey respondents reporting re-use of someone else's spoon (down from 33% in 2000 to 27% in 2004).

Table 3.14: Prevalence of HIV or HCV antibodies among injecting drug users aged 14 years or over, by history of injecting drug use, 2004 (per cent)

	Tested positive to HIV antibody			Tested positive to HCV antibody		
History of injecting drug use	Males	Females	Persons[(a)]	Males	Females	Persons[(a)]
Less than 3 years	2.4	0	1.5	27	22	25
3–5 years	1.5	0	0.9	31	38	33
6–10 years	1.0	0	0.6	53	60	56
10 or more years	1.4	1.0	1.3	71	77	73
History not reported	3.9	0	2.3	54	67	53
Total	**1.4**	**0.5**	**1.1**	**58**	**62**	**60**

(a) Includes people whose sex was reported as transgender or whose sex was not reported.

Source: NCHECR 2005a.

Dietary behaviour

Diet plays a major role in health and in recent decades much evidence has shown that diet can either reduce or increase the risk of various diseases (NHMRC 2003). Dietary guidelines for children, adults and older Australians from the NHMRC recommend consuming a wide variety of nutritious foods, including a high intake of plant foods such as cereals, fruit, vegetables, legumes and nuts. They also recommend moderating sugar and fat intake, limiting saturated fat intake, choosing foods low in salt and limiting alcohol intake. In addition, the guidelines highlight the need to encourage and support breastfeeding and to prepare and store food safely.

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 reducing structural barriers to safe and healthy food (SIGNAL 2001). For Indigenous peoples, the focus is on diet-related diseases, access to healthy food, promotion of breastfeeding, nutrition for mothers and babies, children's nutrition, renal disease and dental health (NATSINWP 2001).

There have been few national nutrition-related data collected in recent years in Australia, with information about food and nutrient intakes last collected in 1995. However, the regular NHS collects limited information on nutrition-related behaviours, and there are also recent data available from state and territory CATI surveys.

Fruit and vegetable consumption

Fruit and vegetable consumption is strongly linked to the prevention of chronic disease and to better health, and the NHMRC dietary guidelines recommend that adults consume two to four serves of fruit and four to eight serves of vegetables per day (NHMRC 2003). However, despite concerns about overconsumption of food in

Australia and its contribution to the rising prevalence of overweight and obesity, large sections of the population are not consuming adequate amounts of fruit and vegetables. Analysis of self-reported data from the 2004–05 NHS shows that 85.7% of people aged 18 years or over did not usually consume five serves of vegetables per day, while 46.0% did not consume two serves of fruit (Table 3.15).

Proportions of people reporting inadequate fruit and vegetable consumption were similar for each state and territory. For vegetable consumption, rates ranged from 80.2% in Western Australia to 89.8% in the Australian Capital Territory. For fruit consumption, rates ranged from 44.0% in Victoria to 50.0% in South Australia.

Data collected through state and territory CATI surveys similarly indicate that a substantial proportion of the population do not consume adequate amounts of fruit and vegetables. The combined CATI data show inadequate vegetable consumption rates of 93.0% for males and 88.8% for females, and inadequate fruit consumption rates of 58.1% for males and 44.0% for females. Inadequate vegetable consumption rates were similar for each state and territory, ranging from 84.3% of persons in Tasmania to 93.0% in Victoria.

Table 3.15: Inadequate consumption of vegetables/fruit, persons aged 18 years or over, 2004–05 (per cent)

	NSW	Vic[(a)]	Qld	WA	SA	Tas	ACT	NT	Aust[(b)]
From 2004 CATI surveys					**Males**				
Inadequate vegetables[(c)]	93.9	96.4	91.3	87.3	93.0	84.6	90.6	91.5	93.0
Inadequate fruit[(d)]	59.7	57.0	56.1	52.0	67.5	58.1	55.3	64.8	58.1
					Females				
Inadequate vegetables	89.7	89.9	88.6	83.0	90.1	84.1	89.0	90.5	88.8
Inadequate fruit	46.7	39.6	42.2	41.4	52.9	47.9	43.1	52.7	44.0
					Persons				
Inadequate vegetables	91.8	93.0	90.1	85.1	91.5	84.3	89.7	91.1	90.9
Inadequate fruit	53.1	48.0	49.0	46.9	60.0	52.8	49.1	59.3	50.9
From 2004–05 NHS					**Persons**				
Inadequate vegetables	88.0	84.6	84.7	80.2	87.9	79.4	89.8	n.a.	85.7
Inadequate fruit	46.0	44.0	47.3	44.6	50.0	46.3	46.5	n.a.	46.0

(a) Reported results have been adjusted for missing values.

(b) Derived from a weighted average of the state and territory estimates for CATI data.

(c) Consumption of four or fewer serves of vegetables.

(d) Consumption of one or no serves of fruit.

Sources: ABS 2006d; AIHW analysis of 'Filling the gaps in data pooling' survey (December 2004); AIHW analysis of Vic Population Health Survey (DHS 2004); NSW Population Health Survey, unpublished data; SA Monitoring and Surveillance System, unpublished data; WA Health and Wellbeing Surveillance System, unpublished data; .

It has been estimated (provisionally, at the time of writing) that, in 2003, inadequate fruit and vegetable consumption was responsible for 1.4% of the total burden of disease in Australia (see Table 3.1). Lock and others (2005) estimate that 1.8% of the global burden of disease may be attributed to inadequate consumption of fruit and vegetables.

This compares with 1.3% for physical activity, 2.3% for overweight and obesity and 4.1% for tobacco.

Folate intake

The impact of good nutrition on health begins early in life. In particular, insufficient folate (a B vitamin also known as folic acid) in the diet of females of child-bearing age increases the risk of having a fetus affected with spina bifida or other neural tube defects. The NHMRC (1994) recommends that females capable of becoming pregnant consume 400 micrograms per day of folate. In 1995, the National Nutrition Survey found 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 show that 11% of females aged 18–49 years were deliberately increasing their intake of folate, with 7% of females deliberately taking vitamin or mineral supplements because they contained folate, and 6.5% and 2.1% (respectively) deliberately consuming food or drinks fortified with folate (ABS 2003d).

Breastfeeding

Breastfeeding has nutritional, health, social and economic benefits. 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 2003). Breastfeeding has also been seen to play an important role in preventing obesity in children, attributed to physiological factors in human milk as well as feeding and parenting patterns associated with breastfeeding.

Australian recommendations for breastfeeding reflect the international recommendation of exclusive breastfeeding for six months, with introduction of complementary foods and continued breastfeeding from six months of age.

In 2001, it was reported that 87% of infants had ever been breastfed and at 6 months of age, 48% of infants were still being breastfed. These data also indicate that 32% of infants aged 6 months or less were fully breastfed (ABS 2003e). These proportions are similar to those reported in 1995.

Food security

The term 'food security' refers to the availability of healthy, affordable foods and the capacity of individuals and communities to access them. Food insecurity can affect nutritional status. In the 2001 NHS, 4.7% of the male respondents aged 19 years or over and 5.6% of the females indicated 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). These results were similar to those obtained in the 1995 National Nutrition Survey.

Food insecurity can be of particular concern for some population groups. Data from the 2001 NHS show that people with no post-school qualifications were significantly more likely to report running out of food and being unable to buy more (6.5%), compared to those with higher degrees (2.6%).

Older people of all backgrounds may be particularly vulnerable to food insecurity. This can result from problems with mobility or transport that lead to difficulty in accessing shops (Russell et al. 1998). People living in rural and remote areas of Australia are also vulnerable as they typically pay more for healthy foods, and perishable items such as dairy foods, fruit and vegetables are frequently in short supply and of poorer quality (NHMRC 2003a). Many Aboriginal and Torres Strait Islander people live in these areas and poor nutrition contributes to their poor health (NHMRC 2000). Others at risk are the poor, people with a disability, the homeless, and those who suffer from substance abuse, alcoholism and some chronic diseases.

Overconsumption of food

While it is important to encourage the population to consume more fruit and vegetables and to address issues surrounding food insecurity, overconsumption of foods, particularly those high in energy and low in nutrients, is a serious problem for the Australian population. Overconsumption, or the consumption of more kilojoules than are required to meet energy needs, is contributing to Australia's increase in obesity, itself a significant risk factor for diseases such as cardiovascular disease and Type 2 diabetes (see the section on body weight later in this chapter).

Data from the National Dietary Survey of School Children and the National Nutrition Survey, respectively, indicate that average energy intake rose by nearly 15% and 12%, respectively, for boys and girls aged 10–15 years between 1985 and 1995. Data from the National Dietary Survey of Adults and the National Nutrition Survey, respectively, indicated that energy intake increased by around 350 kilojoules per day for adults aged 25–64 years living in state capital cities between 1983 and 1995 (Cook et al. 2001).

Saturated fat intake

A diet high in saturated fat increases the risk of coronary heart disease through its effect on raising the blood cholesterol level, notably its LDL component (see Box 3.5). In 1995, saturated fat accounted for around 13% of total energy intake by Australian adults, higher than the recommended maximum level of 10% (AIHW 2004a). The major sources of saturated fats in the adult diet are milk, cheese, butter, pastries, potato chips and meat (ABS & DHAC 1998).

As dairy products contribute significantly to saturated fat intake, the proportion of people who usually consume whole milk may be a useful indicator of saturated fat intakes. From the 2004–05 NHS, 52% of males and 39% of females usually consumed whole cow's milk (ABS 2006d).

Sexual practices

Sexual activity can be associated with health risks and is estimated (provisionally, at the time of writing) to have been the cause of 0.5% of the burden of disease in Australia in 2003 (see Table 3.1). Unprotected sexual intercourse can transmit infections such as chlamydia, gonorrhoea, HIV and syphilis. Sexual activity has also been associated with an increased risk for specific cancers such as cervical cancer and anal cancer.

The Australian Study of Health and Relationships used a CATI between May 2001 and June 2002, with a population-based sample of males and females aged 16–59. It indicated that 5.0% of the males and 5.7% of the females had had some homosexual experience in their lifetime, excluding non-genital sexual experience (Grulich et al. 2003b; Smith et al. 2003). Males and females who identified themselves as homosexual reported an average of 79.1 and 7.8 same-sex sexual partners respectively over their lifetime, whereas males and females who identified themselves as heterosexual reported an average lifetime number of opposite sex sexual partners of 16.7 and 6.5, respectively (de Visser et al. 2003a; Grulich et al. 2003b).

Condom use by males and females for heterosexual encounters in the year before the study interview was associated with younger age, higher levels of education, living in major cities, lower incomes and having more than one sexual partner in the past year (Table 3.16). At their most recent heterosexual encounter, 24.7% of the males and 17.6% of the females reported condom use for vaginal intercourse. At their most recent homosexual encounter, 46.1% and 50.6% of males reported condom use for insertive and receptive anal intercourse, respectively. Although a higher proportion of males reported condom use at their most recent homosexual encounter, compared to corresponding reports by males and females about heterosexual encounters, the higher number of same-sex sexual partners indicates a higher risk of sexually transmissible infections among homosexually active males (Grulich et al. 2003a).

Table 3.16: Sociodemographic correlates of having used a condom for heterosexual activity in the past year, 2001–02 (per cent)

	Males	Females		Males	Females
Age			**Language at home**		
16–19	90.4	84.9	English	41.2	33.9
20–29	67.3	56.8	Other	62.2	40.0
30–39	46.4	37.8	**Education**		
40–49	28.5	18.8	Lower secondary	37.0	24.0
50–59	14.8	6.2	Secondary	44.1	39.7
Sexual identity			Post-secondary	44.6	39.6
Heterosexual	42.5	33.7	**Household income**		
Homosexual	55.4	15.6	Low (<$20,000)	54.1	44.1
Bisexual	35.9	67.5	Middle ($20,000–$52,000)	43.8	32.9
Region of residence			High (>$52,000)	39.1	32.0
Major city	46.5	36.9	**Occupational category**		
Regional	37.4	30.9	Blue collar	43.0	28.8
Remote	36.2	30.9	White collar	46.6	35.9
Excessive alcohol consumption			Manager/professional	37.8	32.5
No	57.3	46.3	**Partners in last year**		
Yes	49.3	43.5	1	36.1	30.0
Total	42.5	34.2	2 or more	78.4	80.5

Source: Australian Study of Health and Relationships (de Visser et al. 2003b).

Among homosexually active males in Sydney, the proportion who reported unprotected anal intercourse with casual partners gradually increased from 14.0% in 1996 to 25.7% in 2001, then declined to 22.4% in 2004; a similar trend was observed among homosexually active males in other capital cities in Australia (NCHECR 2005a). Trends in rectal isolates of gonorrhoea among males support the reports of unprotected anal intercourse. The rate of these isolates among males in New South Wales increased to 4.1 per 100,000 population in 2002 and then declined to 3.0 per 100,000 population in 2004.

While the overall Australian rate of diagnosis of new cases of syphilis remained relatively stable in the period from 2000 to 2004, the rate almost doubled in New South Wales and increased ninefold in Victoria, and these increases were almost completely confined to homosexually active males (NCHECR 2005a).

In the period 2000 to 2004, chlamydia was the most frequently reported acute sexually transmissible infection in Australia. The population rate of diagnosis of chlamydia more than doubled, from 91.4 per 100,000 population in 2000 to 186.1 per 100,000 population in 2004 (NCHECR 2005a). Chlamydia was the only acute sexually transmissible infection under national surveillance for which the female-to-male ratio was above 1.0 in the years 2000 to 2004, indicating continuing unsafe heterosexual behaviour.

Vaccination

Vaccination is the administration of a vaccine to children and adults in order to stimulate the immune system and protect against a specific infectious disease. It has two main purposes. First, it is an effective way of providing individual protection against specific infectious diseases. Second, 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. For example, smallpox has been eliminated worldwide, and poliomyelitis has been eradicated in most parts of the world including the Western Pacific region of the WHO. This has allowed routine smallpox vaccination to be discontinued. Vaccination against poliomyelitis must be continued because of the potential for reintroduction from areas where infection persists.

In the late 1800s, vaccines were developed against smallpox, plague and typhoid, and were used extensively throughout Australia. Over time, new vaccines have been developed for many infectious diseases and large-scale vaccination programs have been implemented for both children and adults.

Information on childhood vaccination is presented in Chapter 5.

Influenza and pneumococcal vaccination for adults

Vaccination against influenza and pneumococcal infection (which causes pneumonia) is available in Australia and is free to those aged 65 years or over, for Indigenous Australians aged 50 years or over, and for Indigenous Australians aged 15–49 years in high-risk groups.

The most recent national telephone survey estimated that 79.1% of Australians aged 65 years or over were vaccinated against influenza in 2004 (AIHW 2005e), a marked increase from 61% in 1998. When the vaccination status of aged care residents was taken into account, the estimated coverage for 2004 lifted slightly to 79.5%.

For pneumococcal disease, the estimated vaccination coverage of Australians aged 65 years or over in 2004 was 51.1%. More of this target group may have been vaccinated, but the currency of their vaccination could not be fully determined from the survey.

Other health behaviours

A wide range of other behaviours influence the health of Australians. These include use of sun protection measures; use of seat belts and helmets; avoidance of mosquito bites, tattooing and body piercing; and hygiene measures such as hand washing. Information that is both recent and national is not available for many of these behaviours. However, some information is available for some of them.

The 2001 NHS (ABS 2002b) showed that sun protection measures had not been used for 6.4% of children aged 0–6 years in the month before interview and, across all ages under 18, the figure was 8.6%. In 2002, the most common sun protection measures reported by female secondary school students in New South Wales were wearing sunscreen (46.3%), wearing a hat (29.5%), and staying mainly in the shade (29.4%). For male students, the most commonly reported measures were wearing a hat (51.8%), wearing sunscreen (35.0%) and staying mainly in the shade (26.8%). Rates of wearing hats and use of maximum protection sunscreen had fallen compared with 1993, but rates of mainly staying in the shade had risen (Population Health Division 2004).

The 2003 New South Wales adult health survey asked respondents about food handling practices in the home. Overall, 60.8% of people aged 16 years or over (64.4% for females, 56.3% for males) reported that they washed their hands with soap after preparing raw meat. Others wiped or rinsed their hands without using soap, or continued cooking without cleaning their hands (Centre for Epidemiology and Research 2004).

3.6 Biomedical factors

As noted in the introduction to this chapter, biomedical risk factors are determinants expressed as a body measurement. Three important risk factors are overweight, high blood pressure and high blood cholesterol. These factors are often highly interrelated. Excess body weight, high blood pressure and high blood cholesterol 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 lead to high blood pressure and high blood cholesterol.

Blood pressure

High blood pressure (often referred to as hypertension; see Box 3.4) is a major risk factor for coronary heart disease, stroke, heart failure and kidney failure. The risk of disease increases as the level of blood pressure increases. 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).

Major causes of high blood pressure include diet (particularly a high salt intake), obesity, excessive alcohol consumption and insufficient physical activity. Whether sustained psychological stress has an effect on a person's average blood pressure level is subject to further research, but stress is likely to have indirect effects by influencing harmful health behaviours associated with high blood pressure (WHO 2002). Attention to health determinants such as body weight, physical activity and nutrition play an important role in maintaining healthy blood pressure.

Despite the definition of high blood pressure in Box 3.4, 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. Both systolic blood pressure and diastolic blood pressure are predictors of cardiovascular disease.

Box 3.4: 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.

There is a continuous relationship between blood pressure levels and cardiovascular disease risk. This makes the definition of high blood pressure somewhat arbitrary. The WHO 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 1999.

The burden of disease in Australia that can be attributed to high blood pressure was estimated (provisionally, at the time of writing) to be more than 7.3% of the total in 2003 (see Table 3.1).

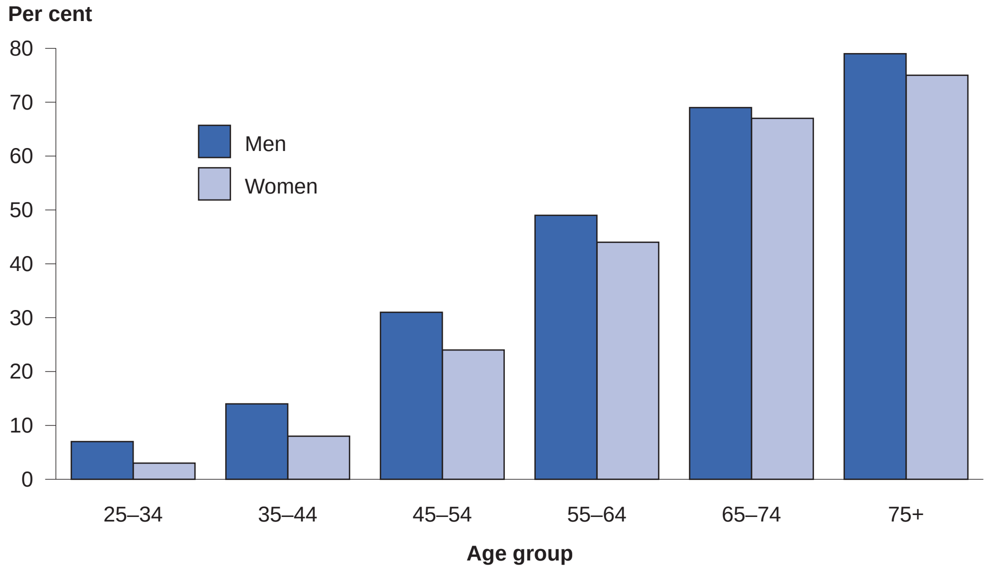
Prevalence

The 1999–2000 Australian Diabetes, Obesity and Lifestyle Study (AusDiab) measured blood pressure and the results indicated that 30% or 3.7 million Australians aged 25 years or over had high systolic or diastolic blood pressure or were on medication for high blood pressure—32% of males and 27% of females. The proportion of males and females with high blood pressure increased with age (Figure 3.6).

Trends

Between 1995 and 1999–2000 the prevalence of high blood pressure among people aged 25 years or over remained about the same—31% in 1995 and 30% in 1999–2000.

Longer-term trends are available only for the urban population. They indicate that since 1980 the prevalence of high blood pressure has decreased markedly for both males and females (Figure 3.7). 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 halved for females, from 32% in 1980 to 16% in 1999–2000. Average blood pressure also decreased over this period. Average systolic blood pressure fell from 134 to 128 mmHg for males, and from 127 to 121 mmHg for females. Average diastolic blood pressure fell from 85 to 74 mmHg for males, and from 79 to 68 mmHg for females (AIHW 2004b).



Note: Based on WHO definition of high blood pressure (Box 3.4).
Source: AIHW analysis of 1999–2000 AusDiab.

Figure 3.6: Proportion of adults with high blood pressure, 1999–2000

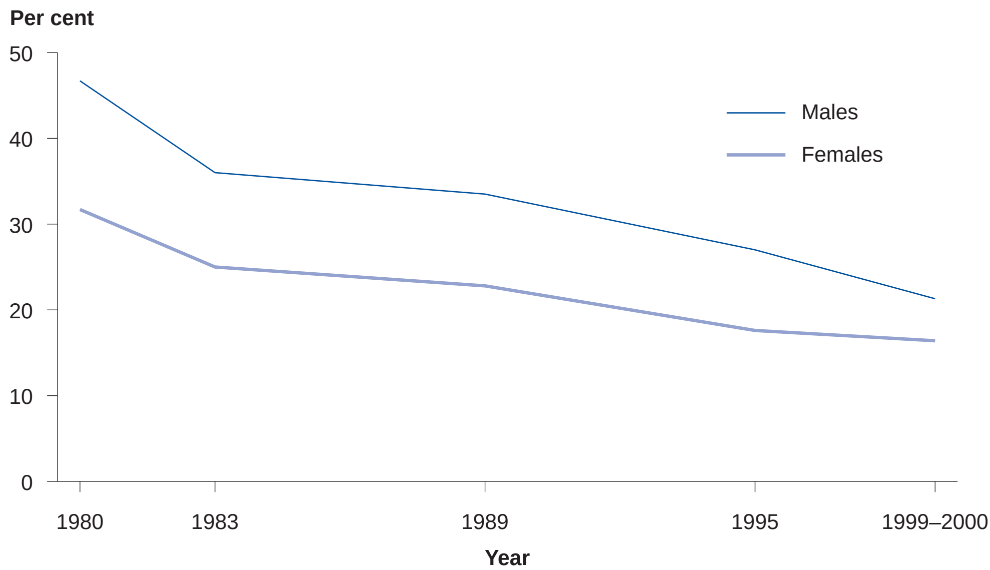
Aboriginal and Torres Strait Islander peoples

There are no national data on measured blood pressure to assess the prevalence of high blood pressure among Aboriginal and Torres Strait Islander peoples. However, self-reported data collected in the 2004–05 National Aboriginal and Torres Strait Islander Health Survey showed that Indigenous people reported high blood pressure from a younger age than non-Indigenous Australians. Among Australians of all ages, 15% of Aboriginal and Torres Strait Islander peoples reported high blood pressure, compared with 10% of non-Indigenous Australians (ABS 2006e).

Blood cholesterol

High blood cholesterol (see Box 3.5) is a major risk factor for coronary heart disease and ischaemic stroke. It is one of the main causes of atherosclerosis, the process by which the blood vessels that supply the heart and certain other parts of the body become clogged. High blood cholesterol was estimated (provisionally, at the time of writing) to have caused about 6.1% of the total burden of disease among Australians in 2003 (see Table 3.1).

For most people, saturated fat in the diet is the main factor that raises blood cholesterol levels (NHFA 1999). Genetic factors can also affect blood cholesterol levels, severely in some cases. Attention to health risk factors such as physical activity and nutrition plays an important role in maintaining a healthy blood cholesterol level (NHFA & CSANZ 2001). Some societies have much lower average cholesterol levels than Australia, with a correspondingly lower rate of cardiovascular disease. Diet is an important factor in maintaining low average blood cholesterol levels in the community (Forge 1999).



Notes

1. Age-standardised to the Australian population as at 30 June 2001.
2. People aged 25–64 years, in urban areas only.
3. Based on WHO definition of high blood pressure (Box 3.4).

Source: AIHW analysis of 1980, 1983, 1989 Risk Factor Prevalence Surveys, 1995 National Nutrition Survey and 1999–2000 AusDiab.

Figure 3.7: Proportion of adults with high blood pressure, 1980 to 1999–2000

Box 3.5: 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 the artery-clogging process known as atherosclerosis that can lead to 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:

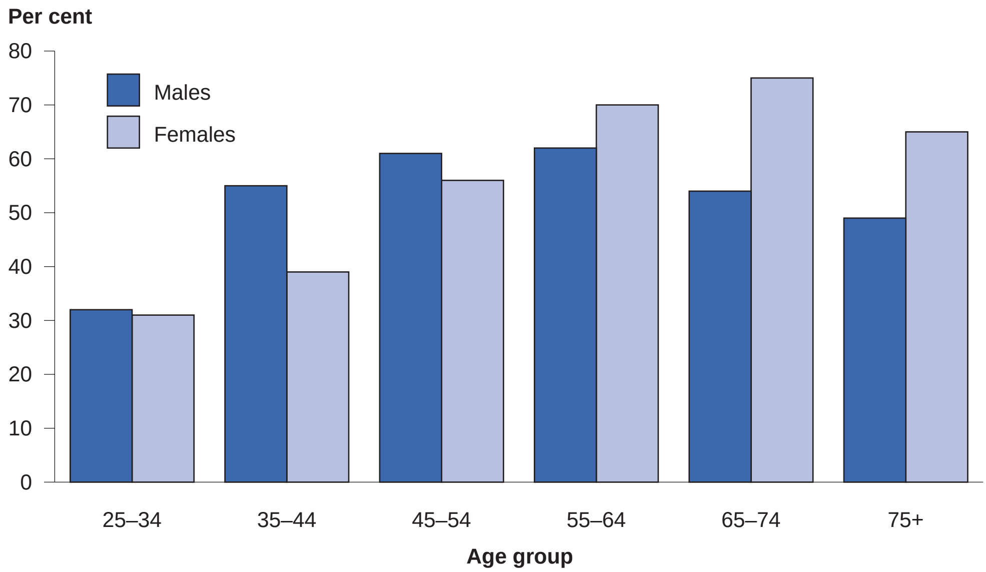
- *Low-density lipoprotein (LDL) cholesterol, often known as 'bad' cholesterol. Excess levels of LDL cholesterol are the main way that cholesterol contributes to atherosclerosis.*
- *High-density lipoprotein (HDL) cholesterol, often known as 'good' cholesterol. High levels have a protective effect against heart disease by helping to reduce atherosclerosis.*

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 atherosclerosis.

In this report, high blood cholesterol is defined as a total cholesterol of 5.5 mmol/L or more.

Average blood cholesterol and prevalence of high blood cholesterol

The 1999–2000 AusDiab estimated that average blood cholesterol levels for those aged 25 years or over in 1999–2000 were 5.5 mmol/L for males and 5.4 mmol/L for females. Around 50% of those in the study had levels of 5.5 mmol/L or more, corresponding to nearly 6.5 million Australian adults aged 25 years or over. The prevalence of high blood cholesterol increased with age to 65–74 years in females and to 55–64 years in males (Figure 3.8).



Note: High blood cholesterol is total cholesterol of 5.5 mmol/L or more.

Source: AIHW analysis of 1999–2000 AusDiab.

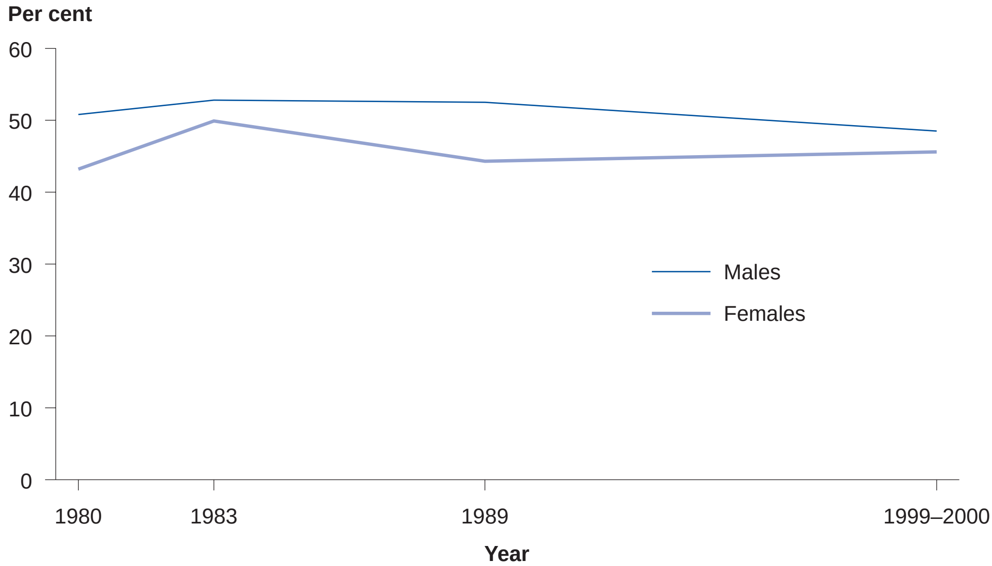
Figure 3.8: Proportion of adults with high blood cholesterol, 1999–2000

Trends

Data on trends in average blood cholesterol and high blood cholesterol prevalence are only available 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 has been no apparent reduction in the prevalence of high blood cholesterol since 1980 (Figure 3.9).

Aboriginal and Torres Strait Islander peoples

There are no national data on measured blood cholesterol levels for Aboriginal and Torres Strait Islander peoples. Self-reports in the 2004–05 National Aboriginal and Torres Strait Islander Health Survey led to an estimate that, across all ages, 6% of Indigenous and 7% of non-Indigenous Australians would have had high blood cholesterol that year (ABS 2006e). However, this is a much lower prevalence than found in studies that measure cholesterol levels, suggesting that self-reports are not an accurate measure.



Notes

1. Age-standardised to the 2001 Australian population.
2. People aged 25–64 years in capital cities only.
3. High blood cholesterol is total cholesterol of 5.5 mmol/L or more.

Source: AIHW analysis of 1980, 1983, 1989 Risk Factor Prevalence Surveys and 1999–2000 AusDiab.

Figure 3.9: Proportion of adults with high blood cholesterol, 1980 to 1999–2000

Body weight

With Australia's increasing prevalence of obesity in recent years, body weight has attracted growing public attention as a health concern. The prevalence of obesity has risen dramatically worldwide and the WHO has called the increase 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 this is mainly a problem in developing countries.

While 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 due to improvements in public health and medical care (Flegal et al. 2006).

Overweight and obesity arises through an energy imbalance over a sustained period. While 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 energy sustained 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.

Overweight was the leading determinant of burden of disease in Australia in 2003, estimated (provisionally, at the time of writing) to account for 8.6% of the total (see Table 3.1).

Prevalence and trends

In Australia, the prevalence of overweight and obesity has been increasing markedly over the last two decades. Box 3.6 outlines methods for measuring and reporting statistics on body weight. National data are available from a number of surveys, using either a body mass index (BMI) derived from either self-reported or measured height and weight, or waist circumference.

Prevalence based on self-reported height and weight

The most recent national data based on self-reported height and weight come from the 2004–05 NHS. From this survey (and excluding those for whom BMI could not be derived), 2.5 million Australian adults were estimated to be obese (19% of males and 17% of females aged 18 years or over; BMI of 30 or more). The highest levels of obesity were seen among males aged 45–54 years (23.2%) and females aged 55–64 years (21.7%) (ABS 2006d). 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 or over; BMI of more than 25 but less than 30). Among adults, 1% of males and 4% of females were estimated to be underweight (BMI less than 18.5).

The NHS showed a similar prevalence of overweight and obesity for each state and territory (Table 3.17). Obesity rates ranged from 17.0% in Victoria to 19.6% in South Australia, and overweight rates from 34.2% in Queensland to 36.3% in Victoria.

The prevalence of overweight increased markedly between 1995 and 2004–05. At the more severe end of the spectrum, the prevalence of obesity among Australian adults in 1995, 2001 and 2004–05 was 11%, 15% and 16% respectively.

Self-reported height and weight are also collected as part of state and territory CATI surveys, with quite similar results in 2004 to those of the 2004–05 NHS. They showed obesity rates of 16.5% for males and 16.3% for females, and overweight rates of 42.1% for males and 26.3% for females (Table 3.17). Obesity rates were similar for each state and territory, ranging from 15.3% of persons in the Australian Capital Territory and Queensland to 18.9% in South Australia.

Prevalence based on measured height and weight

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 or 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 (29%), with the lowest rates being among those aged 25–34 (15%) or 75 years and over (14%). Prevalence patterns for all overweight people were similar, with the prevalence increasing with age to 65–74 years, and declining thereafter.

Box 3.6: Classifying body weight

There are two main methods used for monitoring body weight in settings such as population health surveys: body mass index (BMI) and waist circumference. Both provide an acceptable alternative to more accurate measurement of total body fat, which is only feasible for specialised clinical or other settings.

Body mass index

The most common measure of body weight is the BMI, calculated by dividing weight in kilograms by the square of height in metres (kg/m^2). Classification of body weight is based primarily on the association between BMI and illness and mortality. The standard recommended by the WHO (WHO 2000) and included in the National health data dictionary *for adults aged 18 years or over is:*

- *underweight (BMI <18.5)*
- *healthy weight (BMI ≥18.5 and BMI <25)*
- *overweight (BMI ≥25; includes obese)*
- *overweight but not obese (BMI ≥25 and BMI <30)*
- *obese (BMI ≥30).*

This classification may not be suitable for all ethnic groups, who may have equivalent levels of risk at lower BMI (for example Asians) or higher BMI (for example Polynesians) compared with the standard. For children and adolescents aged 2–17 years, Cole and others (2000) have developed a separate classification of overweight and obesity based on age and sex.

Waist circumference

For monitoring overweight, waist circumference is a useful addition to BMI because abdominal fat mass can vary greatly within a narrow range of total body fat or BMI. The National health data dictionary *defines waist circumference cut-offs for increased and substantially increased risk of ill health. 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). For those aged 18 years or over, 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) (NHDC 2003). 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.*

BMI is more commonly used than waist circumference as a measure of overweight and obesity in the population (particularly in self-report surveys), as people are more likely to know their height and weight than their waist circumference.

Self-reported versus measured data

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 (Flood et al. 2000; Niedhammer et al. 2000).

Table 3.17: Prevalence of self-reported overweight and obesity, persons aged 18 years or over (per cent)

Measure	NSW	Vic[a]	Qld	WA	SA	Tas	ACT	NT	Aust[b]
From 2004 CATI surveys									
					Males				
Overweight but not obese[c]	41.0	42.9	40.5	46.0	44.1	43.0	39.5	42.6	42.1
Obese[d]	16.3	14.7	20.0	14.1	18.5	15.1	14.8	18.3	16.5
Overweight or obese	*57.3*	*57.6*	*60.5*	*60.1*	*62.6*	*58.1*	*54.2*	*60.9*	*58.6*
					Females				
Overweight but not obese	26.0	25.3	26.5	27.2	28.9	25.8	26.2	24.0	26.3
Obese	15.4	16.0	16.5	17.0	19.4	17.5	15.9	15.9	16.3
Overweight or obese	*41.4*	*41.3*	*43.1*	*44.2*	*48.3*	*43.3*	*42.1*	*39.9*	*42.5*
					Persons				
Overweight but not obese	33.7	34.1	33.6	36.3	36.4	34.2	32.9	34.3	34.2
Obese	15.8	15.3	18.3	15.5	18.9	16.3	15.3	17.2	16.4
Overweight or obese	**49.5**	**49.4**	**51.8**	**51.8**	**55.3**	**50.6**	**48.2**	**51.5**	**50.6**
From 2004–05 NHS[a]									
					Persons				
Overweight but not obese	35.8	36.3	34.2	35.4	35.8	36.2	34.6	n.a.	35.5
Obese	18.0	17.0	18.7	17.3	19.6	19.5	18.2	n.a.	18.0
Overweight or obese	**53.8**	**53.3**	**52.9**	**52.8**	**55.4**	**55.7**	**52.8**	**n.a.**	**53.6**

(a) Reported CATI survey results for Victoria and reported NHS results have been adjusted for missing values.

(b) Derived from a weighted average of the state and territory estimates for state CATI data.

(c) Body mass index greater than or equal to 25 and less than 30.

(d) Body mass index greater than or equal to 30.

n.a. Not available, but included in the total.

Sources: AIHW analysis of 2004–05 National Health Survey (ABS 2006d); AIHW analysis of 'Filling the gaps in data pooling' survey (December 2004); AIHW analysis of Vic Population Health Survey (DHS 2004); NSW Population Health Survey, unpublished data; SA Monitoring and Surveillance System, unpublished data; WA Health and Wellbeing Surveillance System, unpublished data.

Prevalence based on waist circumference

Waist circumference is 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 or over were classified as 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 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).

Children and adolescents

There is a lack of recent national data on overweight and obesity among children and adolescents, with the most recent being that from the 1995 NHS. Using the standard international definitions of body weight, the prevalence of overweight (including obesity) among children and adolescents aged 2–18 years was 19.5% for boys and 21.1% for girls in 1995 (Magarey et al. 2001).

There is a range of evidence that the prevalence of both overweight and obesity in Australian children has risen markedly in recent decades.

A study of data for those aged 7–15 years from five population surveys conducted between 1969 and 1997 illustrated that, between 1985 and 1997, the prevalence of overweight increased by 60–70%, obesity increased two- to fourfold, and the combined prevalence in the overweight and obesity categories doubled. The findings were consistent across data sets and between the sexes. For the period 1969 to 1985, there was no change in the prevalence of overweight or obesity among girls, but among boys the prevalence of both overweight and obesity increased markedly (Booth et al. 2003).

The New South Wales Schools Physical Activity and Nutrition Survey found that the measured prevalence of overweight and obesity combined among young people in New South Wales (from Kindergarten to Year 10) had risen from 20% in 1997 to 25% in 2004. Overall, the prevalence of obesity among boys was 7.7% and among girls it was 6.1% (Booth et al. 2006).

Similarly, the Western Australian Child and Adolescent Physical Activity and Nutrition Survey found that the prevalence of overweight and obesity among students aged 7–15 years increased from 9.3% of boys and 10.6% of girls in 1985 to 21.7% of boys and 27.8% of girls in 2003 (Hands et al. 2004).

Socioeconomic status

Estimates from the 2004–05 NHS for adults aged 18 years or over showed that people in the most socioeconomically disadvantaged group had higher rates of overweight and obesity. Among adults in the first quintile (most disadvantaged), 50% were overweight or obese, compared with 45% of adults in the fifth quintile (least disadvantaged) (ABS 2006d).

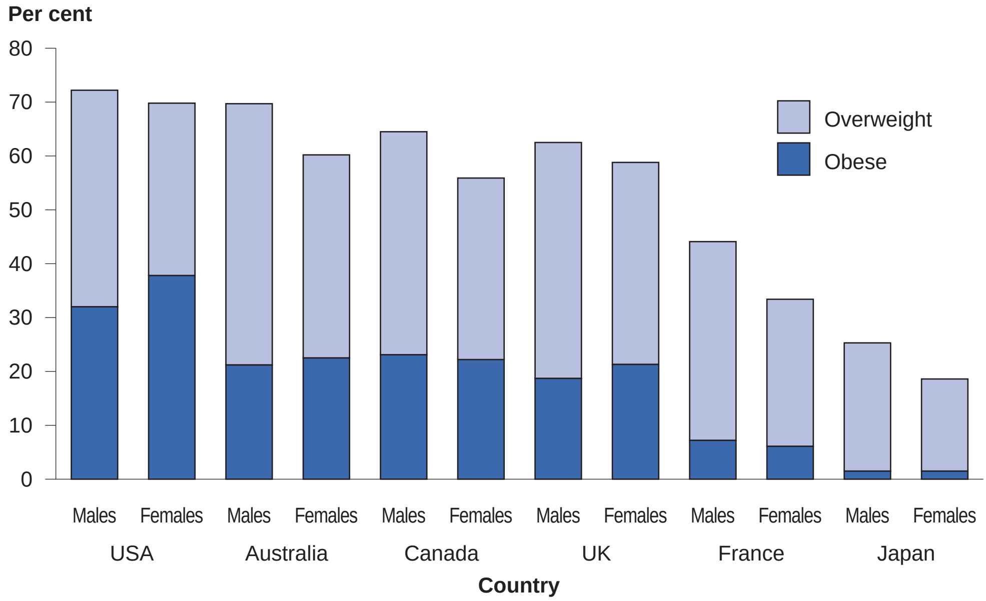
The gradient is more marked when considering obesity alone. Estimates from the 2001 NHS for adults aged 20 years or over showed that females in the most disadvantaged socioeconomic group had nearly double the rate of obesity (23%) of those in the most advantaged group (12%). Males in the most disadvantaged group were also more likely to be obese than those in the most advantaged group (19% compared with 13%) (AIHW: O'Brien & Webbie 2003).

Aboriginal and Torres Strait Islander peoples

Data from the 2004–05 National Aboriginal and Torres Strait Islander Health Survey illustrate that the proportion of Indigenous Australians who were overweight but not obese was lower than the proportion for non-Indigenous people (25% and 30% respectively). However, Aboriginal and Torres Strait Islander people were almost twice as likely to be obese—27% of Indigenous Australians compared with 15% of non-Indigenous Australians (ABS 2006e).

International comparisons

Comparable estimates of the prevalence of overweight and obesity in a selected number of countries are presented in Figure 3.10 (WHO 2005). The prevalence of overweight and obesity among persons 15 years or over in Australia is similar to that in the United States of America, Canada and the United Kingdom, although it is considerably higher than that in France and Japan.



Note: Persons aged 15 years or over.

Source: WHO 2005.

Figure 3.10: Prevalence of overweight (BMI 25 to <30) and obesity (BMI 30 or over), 2002

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4 Health of population groups

Australia's health can be described many ways—including birth rates, death rates, life expectancies, disease incidence, disability and self-perceptions of health status. Regardless of how health is measured, good health is not equally shared by all people in Australia, and different levels of health are experienced by different groups. The health of groups, rather than of individuals or the general population, can also be of special interest because it may suggest common causes of ill health and possibly common solutions.

This chapter, therefore, focuses on various population groups. It highlights key health areas over stages of the life span, by summarising the health of babies, young people, working-age persons, and older people. In this edition of *Australia's health*, the health of children is explored in detail in Chapter 5. People of all ages may have special health needs and problems, depending on their cultural background, genetic inheritance, socioeconomic position or geographic location. For these reasons the chapter also examines population groups defined on these lines, along with specially serviced populations such as veterans and prisoners.

4.1 Babies

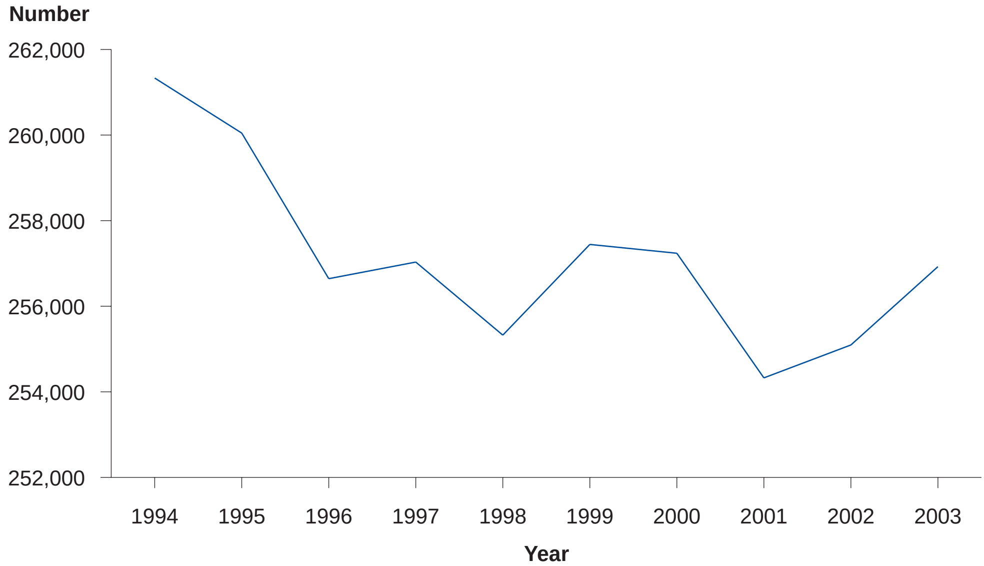
Recent years have seen some notable trends in births and the health of babies. During the decade to 2003, the number of births generally decreased and the proportion of multiple births increased, while perinatal mortality declined. This section presents information on these topics, as well as others including birthweight, pre-term births and congenital abnormalities.

Births

In 2003, there were 256,925 births reported to the National Perinatal Data Collection, an average of 704 per day. These births included 255,099 live births and 1,826 fetal deaths. The number of births in 2003 was clearly lower than a decade before, despite a recent upturn (Figure 4.1).

In Australia, the number of births reached its all-time peak in 1971, when 276,400 were registered. It then fell sharply during the remainder of the 1970s, before increasing from the early 1980s to reach 264,200 in 1992. Over the decade up to 2001, the number of births generally declined, but they increased in 2002 and 2003 (ABS 2005a).

The crude birth rate, which is the number of live births per 1,000 population, was 12.7 in 2004, down from 14.5 in 1994. Australia's rate lies between those of the United Kingdom (11.3 in 2002) and the United States (13.9 in 2003). Among developed countries, Japan's rate is low (8.8 in 2003), and Ireland's is high (15.5 in 2003) (see Table S4).



Source: AIHW NPSU: Laws & Sullivan 2005.

Figure 4.1: Number of births, 1994–2003

Sex ratio

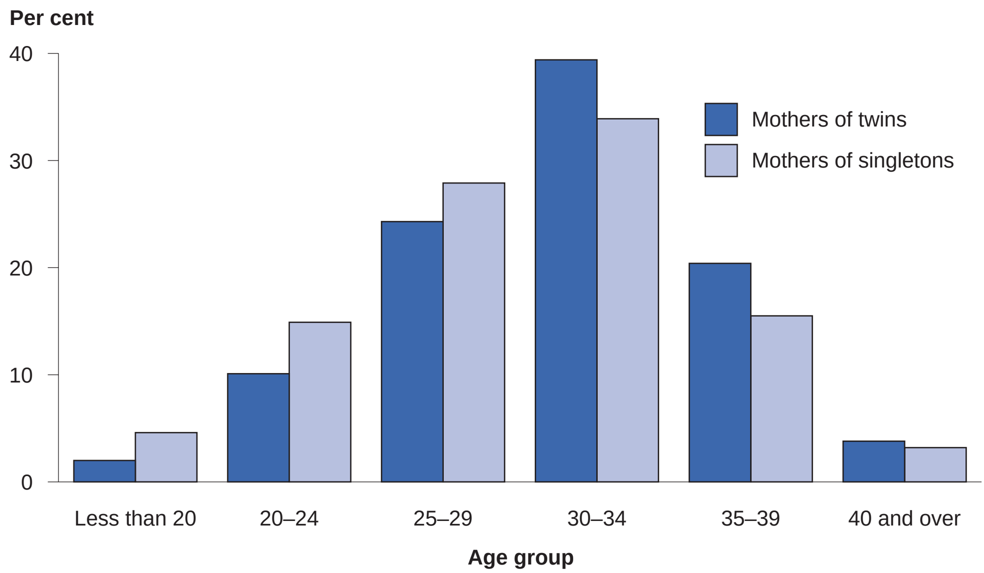
Male births exceed female births in developed countries, including Australia (Table S4). In 2003, Australia's male births accounted for 51.5% of all births. This proportion was similar across the states and territories, and has changed very little over time. In 2003, the national sex ratio was 106.1 male births per 100 female births. The ratio was highest in Tasmania, at 110.3 male births per 100 female births, and lowest in Western Australia, at 104.8. For single births nationally, the sex ratio was 106.3, falling to 100.9 for twins and 84.8 for other multiple births.

Multiple births

The rate of multiple births in Australia has risen steadily since the early 1980s. This can be attributed to several factors, including an increasing average age of mothers giving birth and growing use of fertility drugs and assisted conception.

There were 8,356 twin and 244 triplet and higher order multiple births in 2003, representing 3.3% and 0.1% of all births in Australia, respectively. The associated multiple birth rate was 33.5 per 1,000 births, increasing from 27.8 in 1994.

Figure 4.2 shows the different age distributions for mothers having twins compared with mothers having a single baby (a singleton). In 2003, mothers having twins were older, with 39.4% being aged 30–34 years and 24.2% being aged 35 years or over. This compared with 33.9% aged 30–34 years and 18.7% aged 35 years or over for mothers having a singleton.



Source: AIHW NPSU: Laws & Sullivan 2005.

Figure 4.2: Age distribution of mothers of twins and of singletons, 2003

Birthweight

A key indicator of infant health is the proportion of babies with a birthweight of less than 2,500 grams. These low-birthweight 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.

In 2003, the average birthweight of all live-born babies was 3,372 grams. The average birthweight of live-born males (3,433 grams) was slightly higher than that of females (3,308).

There were 16,086 live-born low-birthweight babies in 2003, representing 6.3% of all live births, up from 5.8% in 1994 (Table S5). Low birthweight was more likely among female babies (6.9%) than male babies (5.8%), and more male babies (48.0%) than females (37.5%) had a birthweight of 3,500 grams or over.

Singleton babies generally have higher birthweights than babies of multiple births. In 2003, the average birthweight for singleton live births was 3,406 grams, higher than that for live-born twins (2,403) or higher order multiples (1,598).

The average birthweight of live-born babies conceived in 2003 after assisted reproductive technology (ART) was 3,019 grams. This compares with 3,372 grams for all Australian live-born babies born in 2003. Further, 20.8% of live-born ART babies conceived in 2003 were low-birthweight babies, compared with 6.3% of all live-born babies in 2003.

Pre-term births

Pre-term births—those occurring before 37 weeks gestation—are associated with neonatal problems that cause significant morbidity and mortality in newborn babies and may sometimes be associated with long-term disabilities. Of all births in Australia in 2003, 20,243 (7.9%) were pre-term. The Northern Territory had the highest proportion, at 11.3% of all births, and New South Wales reported the lowest, at 7.0% (Table 4.1). The average gestational age of all babies was 38.9 weeks in 2003, and for pre-term births it was 33.2 weeks.

Table 4.1: Gestational age of pre-term births, by state and territory, 2003

Gestational age (weeks)	NSW	Vic	Qld	WA	SA	Tas	ACT[(a)]	NT	Australia
					Number				
Total	6,032	5,058	4,272	2,032	1,504	503	430	412	20,243
					Per cent of total births				
20–27[(b)]	0.7	1.0	0.8	0.8	0.8	0.9	1.6	1.4	0.8
28–31	0.7	0.7	1.0	0.8	0.9	1.1	0.5	1.0	0.8
32–36	5.6	6.2	6.8	6.7	6.7	7.1	6.7	8.8	6.2
Total	**7.0**	**8.0**	**8.5**	**8.2**	**8.4**	**9.1**	**8.8**	**11.3**	**7.9**

(a) 15.2% of females who gave birth in the ACT were non-ACT residents. Care must be taken when interpreting percentages. For example, the proportions for ACT residents were as follows: 20–27 weeks gestation: 1.1% of total births; 28–31 weeks: 0.3%; and 32–36 weeks: 5.3%.

(b) Includes seven babies of less than 20 weeks gestation.

Note: For multiple births, the gestational age of the first-born baby was used for all subsequent babies.

Source: AIHW NPSU: Laws & Sullivan 2005.

Pre-term birth was more likely for babies of multiple births. Whereas 6.3% of singletons were pre-term, 52.3% of twins and 100% of higher order multiples were pre-term.

The average gestational age of babies of at least 20 weeks gestation born after conception by ART in 2003 was 37.2 weeks. In this group, pre-term birth occurred in 11.7% of singleton births, 59.3% of twins and 95.2% of triplets.

Admission to special care or intensive care nurseries

Among all live-born babies in 2003, 15.0% were admitted to a special care nursery or neonatal intensive care unit. The proportion was higher for multiple births, and especially higher order multiple births; that is, three or more babies. Of these live births, 89.4% were admitted, compared with 57.6% of twins and 13.6% of singletons.

Babies of Aboriginal and Torres Strait Islander mothers

In 2003, there were 8,958 babies born to Aboriginal or Torres Strait Islander mothers, representing 3.5% of all Australian births. Of live births to Indigenous mothers, 12.9% were classified as low-birthweight, compared with 6.0% for live-born babies of non-Indigenous mothers. Babies of Indigenous mothers were also more likely to be pre-term (14.1%), compared with babies of non-Indigenous mothers (7.6%).

For the period 1998–2002, the perinatal mortality rate for babies born to Indigenous mothers in Queensland, Western Australia, South Australia and the Northern Territory (21.4 deaths per 1,000 relevant births) was more than twice that for babies born to non-Indigenous mothers in these jurisdictions (9.6 per 1,000 births) (ABS & AIHW 2005).

Perinatal mortality

Perinatal deaths occur in the period shortly before or after birth. Here, perinatal deaths include stillbirths (fetal deaths) and deaths of infants within the first 28 days of life (neonatal deaths), where the fetus or infant weighs at least 400 grams or, if birthweight is unknown, has a gestational age of 20 weeks or more.

Overall, the perinatal death rate declined over the decade from 9.1 per 1,000 births in 1994 to 8.0 per 1,000 births in 2004 (see also Tables S7 and S8). Fetal deaths (5.3 per 1,000 births) accounted for 65.8% of perinatal deaths in 2004, and neonatal deaths (2.8 per 1,000 live births) for 34.2%. The perinatal death rate for males (8.8 per 1,000 births) was higher than that for females (7.2) (ABS 2006a).

In 2004 there were 2,048 perinatal deaths—1,347 fetal and 701 neonatal. Two-fifths (42.3%) of all registered fetal deaths were not allocated a specific cause of death, since medical certifiers are often unable to provide an accurate cause without the assistance of an autopsy. The main documented causes of fetal deaths were respiratory and cardiovascular disorders specific to the perinatal period (14.8% of recorded causes), intrauterine hypoxia (14.1%), and congenital malformations, deformations and chromosomal abnormalities (13.9%) (ABS 2006a).

Congenital anomalies

Congenital anomalies are structural defects present at birth. Table 4.2 presents data on these for selected states (Victoria, Western Australia and South Australia). The reported rate (including live births and stillbirths) of selected congenital anomalies is presented as well as their estimated rate (including live births, stillbirths and induced abortions under 20 weeks gestation)—see Box 4.1 for definitions of the selected birth anomalies. The measure including abortions is estimated because the total number of induced abortions under 20 weeks gestation was unknown. This estimated rate is useful for evaluating the effectiveness of primary prevention and prenatal screening strategies.

Box 4.1: Congenital anomalies

Anencephalus: *Total or partial absence of the cranial vault, the covering skin and the brain tissue.*

Diaphragmatic hernia: *Protrusion of the abdominal organs into the chest through a defect in the diaphragm.*

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).*

Renal agenesis or dysgenesis: *One or both of the kidneys are absent or severely abnormal in their development.*

Exomphalos: *An umbilical hernia. Protrusion of abdominal contents through the navel (umbilicus).*

Gastroschisis: *Protrusion of the gut through an abdominal wall defect next to the navel.*

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.*

Source: Based on Riley & Halliday 2004.

In 2001, the reported rate of neural tube defects was 5.5 per 10,000 births. These defects occur when an embryo's forerunner of the brain and spinal cord—the neural tube—does not form normally. The estimated rate was markedly higher at 13.6 per 10,000 births. Of the neural tube defects, spina bifida had the highest reported rate—3.7 per 10,000 births. Spina bifida also had the highest estimated rate (6.3 per 10,000 births). For Down syndrome, the estimated rate was markedly higher than the reported rate (25.4 per 10,000 births compared with 11.4) (Table 4.2).

Table 4.2: Selected congenital anomalies, Victoria, Western Australia and South Australia, 2001[(a)]

		Live births and stillbirths		Live births, stillbirths and induced abortions <20 weeks gestation	
Congenital anomaly	**ICD-9-BPA code[(b)]**	**Number**	**Per 10,000 births[(c)]**	**Number**	**Per 10,000 births[(c)]**
Neural tube defects					
All neural tube defects	740.00–742.09	58	5.5	142	13.6
Anencephalus	740.00–740.29[(d)]	9	0.9	61	5.8
Spina bifida	741.00–741.99	39	3.7	66	6.3
Encephalocele	742.00–742.09	10	1.0	15	1.4
Renal agenesis or dysgenesis	753.00–753.01	51	4.9	59	5.6
Anomalies of the abdominal wall					
All anomalies of abdominal wall	756.70–756.79	56	5.3	72	6.9
Exomphalos	756.70	22	2.1	35	3.3
Gastroschisis	756.71	32	3.1	33	3.1
Diaphragmatic hernia	756.61	24	2.3	29	2.8
Down syndrome	758.00–758.09	119	11.4	266	25.4

(a) Births and induced abortions under 20 weeks gestation occurring in 2001 with congenital anomalies notified by 31 December 2002 are included.

(b) Classified using the British Paediatric Association Classification of Diseases (British Paediatric Association 1979).

(c) Numerator: Reported rate—live births and stillbirths 20 weeks or more gestation or 400g or more birthweight with the specified congenital anomaly. Estimated rate—live births and stillbirths 20 weeks or more gestation or 400g or more birthweight and induced abortions under 20 weeks gestation or under 400g birthweight with the specified congenital anomaly. Denominator: live births and stillbirths 20 weeks or more gestation or 400g or more birthweight.

(d) Includes 740.1 Craniorachischisis and 740.20–740.29 Iniencephaly.

Source: AIHW NPSU 2004.

4.2 Young people aged 15–24 years

Australia's health 2006 features a special chapter on Australia's children (aged 0–14 years: see Chapter 5). This section focuses on those aged 15–24 years and here they are referred to throughout as 'young people' or 'young Australians'. Where a different age group is used, such as 15–17 or 18–24 years, it is specified.

In June 2004, there were 2.8 million young people in Australia, representing 14% of the total population. A little over 3% (about 84,000) of all young Australians in June 2001 were Indigenous. These young people make up 18% of the total estimated Indigenous population, which has a younger age profile generally.

Most young Australians are in good health, as indicated by general health levels, low and declining overall mortality, and low levels of morbidity and disability. Most also rate their own health positively. However, health is not always as good for young people who are socially disadvantaged, who live in rural and regional areas or who are Indigenous.

In addition, some areas of concern remain about the health of young people generally. They include mental health problems, a number of long-term health conditions, obesity, substance use, and accidents and injury. These are discussed later in this section.

Health status (self-rated) and disability

From self-ratings in the 2004–05 National Health Survey (NHS), about 70% of young Australians were in either 'excellent' or 'very good' health, while a further 24% rated their health as 'good'. Only 7% reported their health to be either 'fair or poor'. By contrast, the proportion of Indigenous young Australians rating their health as 'excellent' or 'very good' was only 59%; and similarly they were more likely, at 9%, to rate their health as 'fair or poor' (ABS 2006b; ABS 2006c).

About 251,300 young Australians (9%) were living with a disability in 2003. The effect of these disabilities on a person's daily living is indicated by the presence or otherwise of a 'profound or severe core activity limitation'. Of the young people with a disability, 24.2% experienced such limitations, amounting to almost 1 in 40 among young Australians overall (ABS 2004b).

Risk and protective factors

Nutrition and body weight

The National Health and Medical Research Council (NHMRC) recommends a minimum of three servings per day of fruit and three of vegetables for children and adolescents aged 12–18 years. For people aged 19 years and over, the recommended minimum daily intake is two serves of fruit and five serves of vegetables (NHMRC 2003a, 2003b).

The 2004–05 NHS found that 26% of young people aged 15–18 years who were surveyed ate one or less serves of vegetables per day, and 49% ate one or less serves of fruit per day. Among young people aged 19–24 years, 57% ate one or less serves of fruit, and 79% ate three or less serves of vegetables per day (ABS unpublished data).

Based on self-reported height and weight, 19% of young Australians (22% of males, 15% of females) were overweight but not obese, and 6% (5% males, 6% females) were obese in 2004–05 (ABS 2006b; ABS unpublished data). Indigenous young people were more likely than non-Indigenous young Australians to be obese. In 2004–05, 17% of Indigenous young people (19% males, 14% females) were overweight but not obese, and 12% (12% males, 12% females) were obese (ABS 2006c). Among young females in 2001, those in regional areas were 30% more likely than those in major cities to be overweight or obese. By contrast, young males in regional areas were less likely to be overweight or obese than those in major cities (AIHW 2005h).

Alcohol, tobacco and other substance use

According to the 2004 National Drug Strategy Household Survey (NDSHS), in 2004 about 22% of young people were current smokers, and 71% had never smoked (2004 NDSHS unpublished data).

In 2004, 39% of both male and female young Australians had consumed alcohol at levels considered risky or high risk in the short term; that is, seven or more standard drinks in any one day within a month (2004 NDSHS unpublished data).

One in six Australians (15.3%) overall had used an illicit drug in the preceding 12 months but this included almost three in 10 young Australians—31% of the males and 26% of the females (AIHW 2005a). The illicit drugs most commonly used by young people in the preceding 12 months were marijuana/cannabis (24% had used it), ecstasy (9%) and methamphetamines or amphetamines (8%) (2004 NDSHS unpublished data).

Physical activity

From self-reports in 2004, over 50% of young people surveyed said that they had participated in physical activity three or more times a week in the preceding year, while 8% had engaged in no physical activity. The types of activities included aerobics/fitness (24.8% undertaking it), walking (22.7%) and swimming (19.4%) (ASC 2005).

Sun protection

According to the 2001 NHS, 82% of Australians aged 15–17 years had used some form of sun protection in the month before the survey. About 49% of young people in the 2004–05 NHS reported that they regularly checked their skin for changes in freckles and moles or had it checked by a doctor, a decrease from 55% in 2001 (ABS unpublished data).

Teenage pregnancy

In 2004, 4.3% of all births (10,857) in Australia were to females aged less than 20 years and a further 14.2% (36,146) were to those aged 20–24 years. These proportions have declined since 1994, when 5.0% of births were to females aged less than 20 years, and 19.1% to those aged 20–24 years.

Fertility at younger ages continued to be much higher among Indigenous females. In 2004, the fertility rate among Indigenous females aged 15–19 years was 71 per 1,000 females and for those aged 20–24 years it was 128. The corresponding rates for all females of those ages were 16 and 53 (ABS 2005a).

Health conditions

Mental health

Mental health problems in young people, if not resolved early, can affect their learning abilities, social development and physical health, and can often also lead to risky behaviours, substance use, and suicidal thoughts and attempts (Raphael 2000). Almost one in eight young people (13%) aged 15–17 years had a mental health 'problem' according to a national survey conducted in 1998 (see Box 4.2). The survey also found that nearly one in 10 young people (9.8%) of that age had a mental health 'disorder' such as attention-deficit hyperactivity disorder (ADHD), conduct disorder or depression (Sawyer et al. 2000).

The prevalence of a mental health disorder among those aged 18–24 years was 27% in 1997. The most prevalent disorders in this age group were substance use disorders (one in six were affected), followed by anxiety disorders (one in nine) (ABS 1998).

Box 4.2: Measuring the mental health of young Australians

The most recent national effort to assess the mental health of young Australians was the National Survey of Mental Health and Wellbeing. The survey's adult component (ages 18 or over) was run in 1997 and the child and adolescent part was in 1998.

For the children and adolescents in the survey, mental health was assessed in two different ways—mental health 'problems' and mental health 'disorders'. They were described as having a 'mental health problem' if the number of emotional and behavioural problems they were reported as having by their parents was similar to the number previously reported for children and adolescents attending mental health clinics. For adolescents aged 13–17 years, reports of emotional or behavioural problems were also obtained from the adolescents themselves. Adolescent-reported 'problems' were defined as present if the number of emotional and behavioural problems an adolescent reported was similar to that previously reported by adolescents attending a mental health clinic.

Children, adolescents and adults were considered to have a mental 'disorder' if they had a pattern of symptoms and impairments that make up a diagnosis, such as major depressive disorder, generalised anxiety disorder or substance abuse disorder. For children and adolescents (up to age 17 years), mental health disorders were assessed through face-to-face interviews with their parents, using a structured interview technique. Participants older than 17 years were interviewed directly.

Because these methods take different perspectives, it follows that an individual young person could have a mental health problem, a mental health disorder, both or neither. It also follows that the prevalence of mental health problems on the one hand and of mental health disorders on the other will overlap and the two cannot be added to each other to give some overall figure.

Injury

Injuries are common in young Australians and are the leading cause of their hospitalisations and death; for young males, injuries accounted for 26% of hospitalisations in 2003–04. Transport accidents and intentional self-harm, discussed further below, are the most common causes of death among young people.

The self-reported data from the 2004–05 NHS showed that close to one in four young people had some kind of injury in the previous four weeks. The most frequently reported injury requiring 'health action' (self-help or professional help) was a cut with a knife, tool or other implement (33% with an injury reporting this), followed by hitting or being hit by something (16%) and a low fall (16%) (ABS 2006b).

Sexually transmitted infections

The most commonly notified sexually transmitted infection among young people is chlamydia, with 21,527 notifications in 2004 (Table 4.3). The highest rates of chlamydia, gonococcal and syphilis infections were in the 20–24 years age group. Rates of chlamydia, gonococcal and syphilis were much higher among young Indigenous Australians than among other young Australians (ABS & AIHW 2005).

Table 4.3: Notifications of sexually transmitted diseases, 2004

	Aged 15–19 years		Aged 20–24 years		Total Australian population	
Disease	Number	Rate[(a)]	Number	Rate[(a)]	Number	Rate[(a)]
Chlamydia	8,328	602.1	13,199	938.2	36,212	180.0
Gonococcal	1,432	103.5	1,579	112.2	7,194	35.8
Syphilis	35	2.5	32	2.3	139	0.7
Donovanosis	2	0.1	1	0.1	10	0.0

(a) Number per 100,000 persons in the group.

Source: DoHA National Disease Surveillance System.

Long-term health conditions

According to self-reports from young Australians in the 2004–05 NHS, 60% of the males and 72% of the females had a long-term condition, namely one that had lasted, or was expected to last, for six months or more. The conditions they most commonly reported were hay fever and allergic rhinitis, short-sightedness, asthma, and back pain or disc disorder. Indigenous young people, at 65% overall, were no more likely to report having a long-term health condition. The long-term conditions they most commonly reported were diseases of the respiratory system including asthma, followed by eye diseases (ABS 2006b).

From the NHS, about one in eight of both young males and females currently had asthma in 2004–05, a clear increase from about one in 10 young Australians in 1989–90. However, it is uncertain whether this increase reflects a higher incidence of asthma, greater community awareness, increased detection by doctors, or some combination of these factors (AIHW 2005g).

Cancer is uncommon among young Australians. In 2001, the incidence of cancer among those aged 15–19 years was 21 per 100,000 persons and for those aged 20–24 years it was 41. These can be compared with an all-ages cancer incidence of 455 per 100,000 persons that year (AIHW & AACR 2004). Despite its low incidence in young people, however, cancer is one of the leading causes of death among them. The most common cancers affecting them in 2001 were melanoma (25% of all cancers diagnosed in the age group), all lymphomas (18%), cancer of the testis (13%) and leukaemias (7%).

Dental health

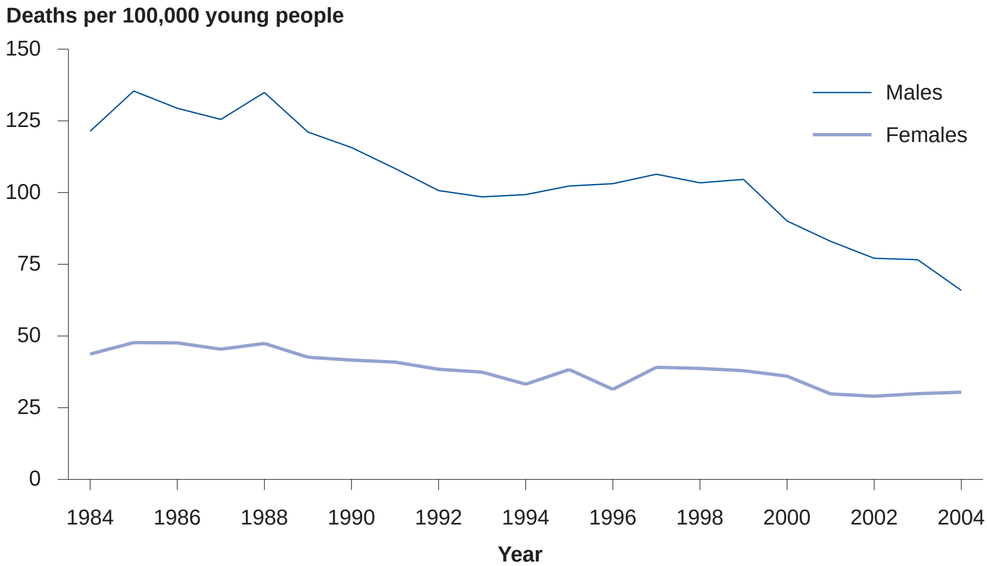
In 2002, over 50% of South Australians aged 15–17 years attending the School Dental Service were found to have previous or present caries in their permanent teeth. A dental examination done as part of the 1999 South Australian dental survey of young adults in the Adelaide metropolitan area showed that nearly one in four persons aged

20–24 years had between one and two teeth affected by caries. This survey also revealed that a further 23% had between three and four teeth affected. Nearly 14% had eight or more teeth affected by caries, suggesting a high risk of developing further caries. Only 20% were free of caries (Ellershaw et al. 2005).

From self-reports in the 1999 National Dental Telephone Survey, 52% of those aged 18–24 years had visited the dentist in the previous six months but 8.3% had not done so in the preceding five years (Carter & Stewart 2002).

Mortality

There were 1,350 deaths of young Australians in 2004, nearly 70% being of males. The death rate for young males declined by 46% over a recent 20-year period, from 121.4 deaths per 100,000 in 1984 to 65.9 in 2004. Correspondingly, the rate for young females declined by 30%, from 43.7 per 100,000 to 30.4 (Figure 4.3).



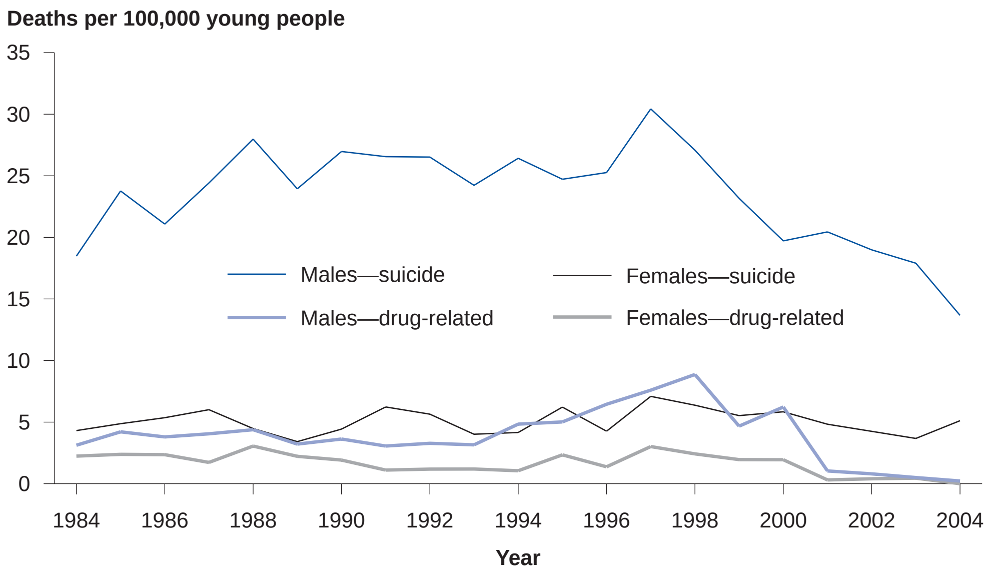
Source: AIHW National Mortality Database.

Figure 4.3: Death rates for young people aged 15–24 years, 1984–2004

The death rates among young people varied markedly by their Indigenous status and where they lived. Although young Indigenous people comprise only about 3% of their age group, Indigenous deaths among young males accounted for 11.8% of the total in 2000–2004 and for Indigenous females the corresponding figure was 12.4%. And considering both Indigenous and non-Indigenous young Australians combined, the mortality rate in Remote and Very Remote areas was 3–4 times that in Major Cities.

In 2004, external causes (including transport accidents and intentional self-harm) were the leading cause of death among young people (702 males and 250 females). Transport accidents were responsible for 32% of all deaths of young people (312 males and 116 females) and intentional self-harm for 20% (196 and 69). Deaths from malignant neoplasms (cancer) followed at 9% of all deaths of young people. Based on data from Queensland, Western Australia, South Australia and the Northern Territory, 26% of young Indigenous deaths in 2004 were due to transport accidents and 31% from intentional self-harm.

The rate of deaths attributed to drug dependence among young Australians fluctuated between 1984 and 2004 but there has been a noticeable decline in recent years (Figure 4.4). The age-standardised drug dependency death rate for young Australians dropped by 97% between 2000 and 2004, with the decline being largely due to a fall in heroin-related deaths that coincided with a period of reduced heroin supply in Australia (ABS 2003a; Stafford et al. 2005).



Source: AIHW National Mortality Database.

Figure 4.4: Deaths from suicide and drug dependency among young people aged 15–24 years, 1984–2004

4.3 Males and females aged 25–64 years

Males and females aged 25–64 years—referred to here as 'working-age adults'—make up the largest proportion of the Australian population. In June 2004, 53% of the total population (10.7 million persons) were aged 25–64 years, comprising equally 5.4 million males and 5.4 million females. This group of people includes the so-called 'baby boomers'—those born between the end of World War II and the early 1960s.

Working-age adults in Australia enjoy good health, taken as a whole, and when gauged by available measures such as mortality and hospitalisation rates, self-reported health, disability and service use, and health risk factor behaviours. Mortality rates have declined rapidly in recent decades, medical advances have produced better diagnosis and treatment, and awareness of avoidable or modifiable risk factors has increased. These provide scope for further improvement in the health of working-age adults (AIHW 2000).

Within this group, however, there are significant variations in health status. Adults who are Indigenous or from lower socioeconomic groups, for example, often have poorer health. They are discussed in more detail elsewhere. Also, older working-age adults are more likely to have poorer health, since ageing is a risk factor for ill health. Recent discussion has also highlighted that, as this large group of people ages, they are expected to place greater demands on health and aged care spending (Commonwealth of Australia 2002).

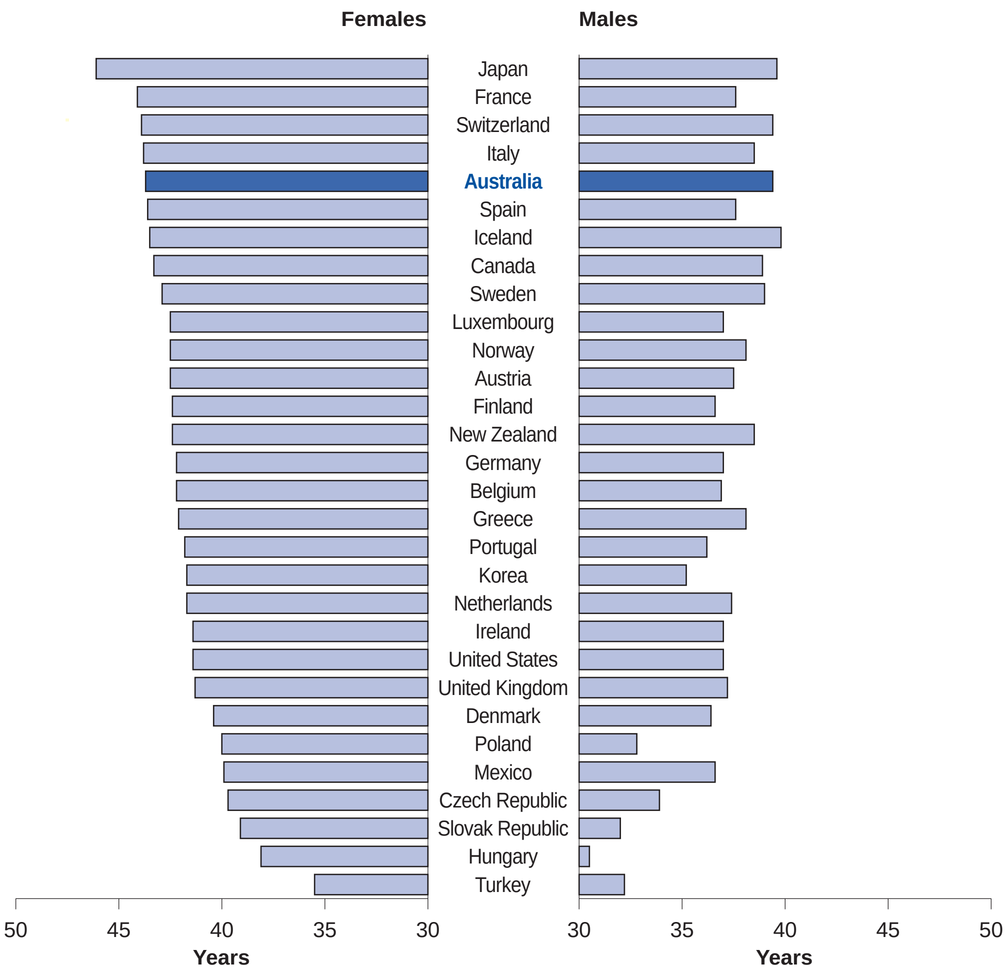
This section provides a broad overview of the health of working-age males and females.

Life expectancy

Life expectancies for working-age males and females are higher now than at any time in the past. For the years 2002–2004, males at age 25 years could on average expect to live to 79.1 years, and females 83.7 years. At age 45 years, life expectancy was 35.2 years for males (to 80.2 years) and 39.3 years for females (84.3); and at age 65 years, 17.8 years for males (82.8) and 21.1 years for females (86.1) (ABS 2005c).

Life expectancies for working-age adults in Australia rank among the highest in the world (Figure 4.5). In 2002, life expectancy at age 40 years for Australian males was 39.4 years, third behind Iceland and Japan. Female life expectancy at age 40 years was 43.7 years, with only Japan, France, Switzerland and Italy having higher life expectancies (OECD 2005).

Persons of working age in Australia can expect to live most of their years in good health. Disability-free life expectancy (DFLE) is a measure of the expected number of years still to be lived without restrictions on everyday activities resulting from a health condition. In 2003, males at birth could on average expect to live 77.8 years, of which 59.1 years (76%) would be free from disability. Females at birth could expect to live 82.8 years, of which 62.2 (75%) would be free from disability. Males aged 25 years could expect 37.3 of 53.8 remaining years (69%) to be free from disability; females aged 25 years could expect 39.6 of 58.5 remaining years (68%) free from disability. At age 65 years, males could expect to live another 17.6 years, of which 7.6 (43%) were free from disability; and females another 21.0 years, of which 8.8 (42%) were free from disability (AIHW: Wen in press).



Note: 2001 data for Italy and Germany, 2000 data Spain and United Kingdom.
Source: OECD 2005.

Figure 4.5: Life expectancy at age 40 years, 2002

Self-reported health

The great majority of working-age Australians consider themselves to be in good health. According to the 2004–05 NHS, 91% of persons aged 25–34 years rated their health as good, very good or excellent, with the remaining 9% reporting only fair or poor health. This figure fell progressively to 75% of persons aged 55–64 years reporting good health or better. Self-reported health status is similar for males and females, but declines with age (ABS 2006b).

Functioning and disability

Almost two million persons aged 25–64 years were estimated to be living with a disability in 2003—about 19% of the population in that age range (AIHW 2005d). In the 2003 ABS Survey of Disability, Ageing and Carers, disability was identified as one or more of 17 impairments, activity limitations or participation restrictions which had lasted, or were expected to last, for at least six months. Of these working-age persons living with a disability in 2003, 452,000 (4% of the population aged 25–64 years) experienced profound or severe limitations, enough to require assistance with daily activities of self-care, mobility and communication.

The most common group of disabling conditions—physical/diverse disability—affects activities such as mobility. In the survey, an estimated 71% of persons aged under 65 years with a disability reported this group as their main disabling condition. Psychiatric (13%), sensory and speech (10%), and intellectual impairments (6%) were the remaining main disabling conditions among persons aged under 65 years.

Disability prevalence rates begin to increase from age 35 years with the onset of risk factors and their impact (AIHW 2005d). Among young adults, and especially young males, injuries involving the spinal cord and brain pose a relatively high risk. During working-age years, injuries related to work are more prevalent, as are arthritis and other musculoskeletal conditions, heart diseases, hearing and psychiatric disabilities. Persons aged 65 years or over are those approaching the years when they may need aged care, or need to move from disability services to aged care services.

Risk factors

Factors increasing the risk of ill health in individuals or populations are discussed in more detail in Chapter 3. These health risk factors can affect all ages, but some are more prevalent among certain age groups. Young persons are more likely to smoke daily, drink alcohol at risky levels, use illicit drugs and eat less than the recommended number of serves of fruit or vegetables. Working-age adults, on the other hand, are more likely to be obese, have high blood cholesterol (males only) and not be sufficiently active. Older persons are more likely to have high blood pressure and high blood cholesterol (females only).

The risk of illness increases with the length of time a person has a risk factor, and with the presence of multiple risk factors. Most adults in the 2001 NHS, regardless of age, were likely to have two risk factors. The estimated prevalence of having five or more risk factors increased with age to 74 years, then decreased slightly for people aged 75 years or over (AIHW: O'Brien 2005).

Illness and disease

Most working-age Australians consider their health to be good, but results from the 2004–05 ABS NHS indicate that 87% had at least one long-term health condition (ABS 2006b). Most common among these were problems with eyesight, including long- or short-sightedness (affecting 32% and 27% respectively) and back and disc problems (21%). Other commonly-reported conditions include hay fever and allergic rhinitis (19%), chronic sinusitis (12%), asthma (9%), arthritis (17%), complete or partial hearing loss (10%) and hypertensive disease (11%). By and large, the prevalence of these diseases increases with age.

The impact of conditions causing major illness, impairment, injury or premature death has been quantified using a measure called the Disability Adjusted Life Year (DALY). One DALY is equivalent to one year of 'healthy' life lost due to premature death or disability (Mathers et al. 1999).

Estimates that are provisional at the time of writing indicate that in 2003 the major contributors to the total number of DALYs, known as the burden of disease, among working-age males included ischaemic heart disease (8.8% of total DALYs), diabetes (7.7%), anxiety and depression (5.6%), suicide and self-inflicted injury (4.7%), road traffic accidents (3.8%) and chronic obstructive pulmonary disease (3.6%). Among working-age females, anxiety and depression (15.1%), breast cancer (7.8%), diabetes (6.2%), chronic obstructive pulmonary disease (3.6%), ischaemic heart disease (3.5%) and chronic back pain (3.1%) were leading causes. It should be noted that these leading contributors to the burden of injury and disease include many of the leading causes of death in this age group, discussed further below, but also additional causes such as anxiety and depression and chronic back pain. Most disability and death in Australia occurs among older people. However, the years lost among working-age adults due to premature death and disability, along with the greater number of persons in this age group, means that the total DALYs are almost as large in absolute terms as those for older persons.

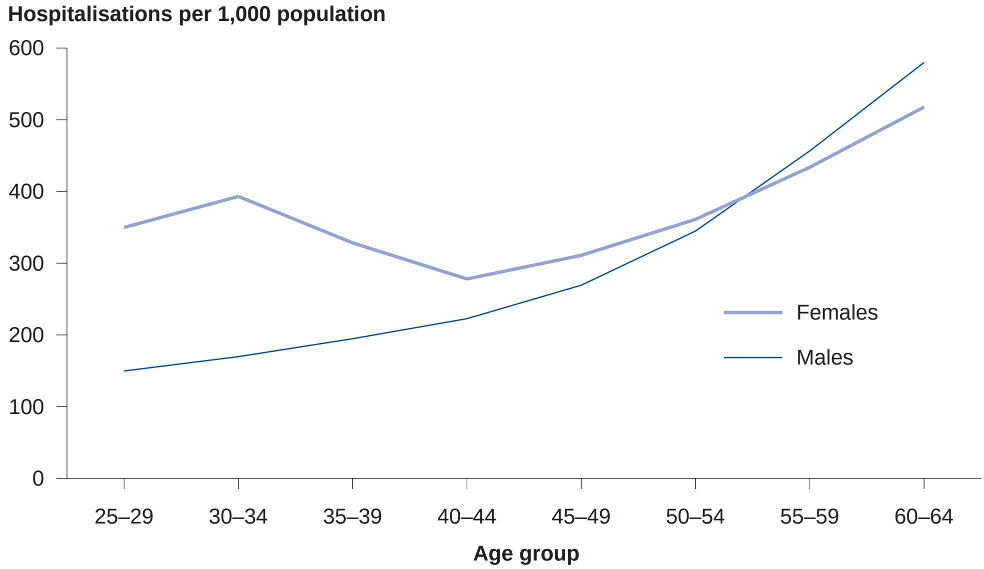
In 2003–04 there were more than 137,500 compensated workplace injury and disease claims resulting in one week or more lost from work—85% of these occurred among those aged 25–64-years, and 68% among males. It is estimated that, in 2000–01, the economic cost of work-related injuries and diseases exceeded $34 billion, or 5% of GDP. Priority industries for occupational health and safety improvement are agriculture, forestry and fishing; manufacturing; construction; transport and storage; and health and community services (NOHSC 2005).

Doctor visits and hospitalisation

During 2005, there were an average of 11.7 Medicare services per Australian, comprising mostly general practitioners (GP) and specialist attendances (6.0 on average) and pathology services (3.9). Service rates vary by sex and age—males and females aged 25–34 years received 5.4 and 12.9 Medicare services respectively, rising to an average of 15.7 and 18.7 services among males and females aged 55–64 years. Among younger males and females aged 25–44 years, much of the difference is due to services related to conception, childbirth and problems associated with the female reproductive system.

The number of problems managed at a GP visit, along with the number of prescriptions written, also rises with age. More problems are managed among females, but prescription rates for both males and females are similar (Britt et al. 2005).

Hospitalisation rates also vary by age group and sex (Figure 4.6). Rates are higher for females of child-bearing age, reaching almost 400 per 1,000 population at age 30–34 years, and then falling to age 40–44 years, before rising again. Male rates rise during working age, but more rapidly after age 45–49 years, and are higher than those for females from age 55–59 years.



Source: AIHW 2005e.

Figure 4.6: Hospitalisation rates among working-age persons, 2003–04

The most common reason for both males and females of working age to be admitted to hospital is dialysis for renal disease (Table 4.4). 'Other medical care' is the next most common diagnosis, the majority of which includes treatments such as radiotherapy, chemotherapy or palliative care. Admissions for pain in the throat and chest, or in the abdomen and pelvis are common. Among females aged 25–44 years, diagnoses related to pregnancy and childbirth (perineal laceration during delivery, medical abortion, and single spontaneous delivery) are frequent.

Table 4.4: Most common principal hospital diagnoses among working-age persons, 2003–04

Males			Females		
ICD-10-AM principal diagnosis		Number	ICD-10-AM principal diagnosis		Number
Z49	Care involving dialysis	226,653	Z49	Care involving dialysis	155,281
Z51	Other medical care	64,705	Z51	Other medical care	96,554
R07	Pain in throat and chest	29,625	R10	Abdominal and pelvic pain	40,231
M23	Internal derangement of knee	25,094	O70	Perineal laceration during delivery	40,063
I20	Angina pectoris	22,957	Z31	Procreative management	31,559
K40	Inguinal hernia	22,421	O04	Medical abortion	29,176
R10	Abdominal and pelvic pain	20,080	K80	Cholelithiasis	26,521
Z50	Care involving use of rehabilitation procedures	20,032	R07	Pain in throat and chest	25,059
K21	Gastro-oesophageal reflux disease	19,766	O80	Single spontaneous delivery	23,804
G47	Sleep disorders	18,318	F32	Depressive episode	23,670

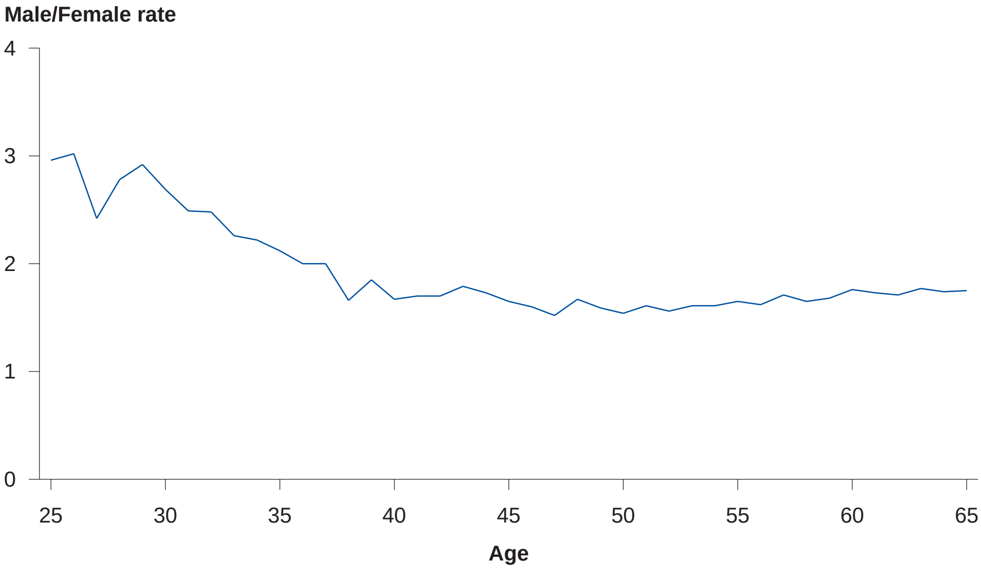
Source: AIHW 2005e.

After excluding hospitalisations related to pregnancy and childbirth, admission rates are similar for males and females. Males are more commonly admitted to hospital for problems associated with the circulatory system or the respiratory system, and for external causes, especially injury. Females are more likely to be admitted to hospital for problems associated with the genitourinary system than males.

Mortality

With life expectancies at birth currently at 78 years for males and 83 years for females, deaths during working age are now considered premature. Nonetheless, in 2004, 22% of all male and 14% of all female deaths were among persons aged 25–64 years.

Death during working ages is more common among males than females. At age 25 years, male deaths are 3 times as common as female deaths, falling to 1.5 times as common at age 50 years, before beginning to rise again to age 64 to approach being twice as common (Figure 4.7).



Source: AIHW Mortality Database.

Figure 4.7: Male:female mortality rate ratios, 2000–2004

Among younger working-age males, death is more likely to result from external causes rather than other causes (Table 4.5). In 2004, the leading single cause of death for males aged 25–44 years was intentional self-harm (26 deaths per 100,000 population), followed by transport accidents (14 per 100,000). Although young females were more likely to die from non-external causes (that is, those causes arising from pathological processes), intentional self-harm was also a leading single cause of death in this age group (6 per 100,000). The cancer death rate among females aged 25–44 years exceeded the corresponding male rate—breast cancer was responsible for 11% of all female deaths in this age group, at a rate of 6 per 100,000 population.

At ages 45–64 years, deaths from non-external causes predominate for both sexes. Among males, 42% of all deaths in this age group were due to cancer (a rate of 202 per 100,000 population). Among females, this figure rose to 56% (162 per 100,000), with breast cancer the most common form. Diseases of the circulatory system, most commonly ischaemic heart disease, were responsible for 27% of male and 15% of female deaths at age 45–64 years (129 and 44 deaths per 100,000 respectively).

Table 4.5: Most common causes of death of people aged 25–44 years and 45–64 years, 2004

	Age 25–44 years			Age 45–64 years		
	Number	Per cent	Rate per 100,000	Number	Per cent	Rate per 100,000
Males						
All causes	**3,656**	**100**	**125**	**11,612**	**100**	**477**
Non-external causes	*1,776*	*49*	*61*	*10,453*	*90*	*430*
Cancer	539	15	18	4,907	42	202
Lung cancer	49	1	2	1,145	10	47
Diseases of the circulatory system	501	14	17	3,131	27	129
Ischaemic heart disease	279	8	10	2,166	19	89
External causes	*1,880*	*51*	*64*	*1,159*	*10*	*48*
Transport accidents	418	11	14	259	2	11
Intentional self-harm	775	21	26	424	4	17
Females						
All causes	**1,759**	**100**	**60**	**6,971**	**100**	**287**
Non-external causes	*1,266*	*72*	*43*	*6,536*	*94*	*269*
Cancer	629	36	21	3,933	56	162
Lung cancer	57	3	2	651	9	27
Breast cancer	188	11	6	976	14	40
Diseases of the circulatory system	206	12	7	1,068	15	44
Ischaemic heart disease	74	4	3	473	7	19
External causes	*493*	*28*	*17*	*435*	*6*	*18*
Transport accidents	99	6	3	107	2	4
Intentional self-harm	169	10	6	130	2	5

Source: AIHW Mortality Database.

Although this age group is typified by the term 'working age', relatively few deaths are formally work-related. During 2004–05, there were 173 work-related injury fatalities notified to occupational health and safety agencies. Over 90% of these were of males, with more than one-third (34%) aged 55 years or over. The causes of work-related fatalities are dominated by vehicle accidents, and to a lesser degree include falls, electrocution and falling objects. Almost half (49%) of the fatality notifications received were for workers employed in the agriculture, forestry and fishing industries, or in construction. These data underestimate work-related deaths, however, since they may not be notified or may occur later in life as a result of work-related injury or disease. A conservative estimate of work-related deaths in Australia is at least 2,000 (NOHSC 2005).

4.4 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 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 age 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 healthier lives than previous generations. This section documents some of that evidence using summary statistics such as life expectancy along with other important national data. The section also examines some specific health conditions that have a considerable impact on the quality of life of older people—conditions such as dementia, vision problems, and arthritis and musculoskeletal conditions.

Older Australians, defined in this section as people aged 65 years or over, make up 13.0% of the population (2,604,900 people in 2004).

Life expectancy

At age 65, Australia's males now expect to live for a further 17.8 years and females for another 21.1 years, which is about six years more than their counterparts at the beginning of the twentieth century (ABS 2005c). Males and females aged 85 years can expect to live for a further 5.7 and 6.9 years respectively, which is about two 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 last century, when mortality from cardiovascular diseases (notably heart disease and stroke) fell rapidly.

Health conditions and disability

The 2003 Survey of Disability, Ageing and Carers (SDAC) collected information on health conditions and level of disability, as reported by people or their carers. The combination of the prevalence of a health condition and the extent of disability among those with the condition is a measure of the impact of the condition on the population.

According to the survey, over 560,000 older Australians had a profound or severe limitation (Table 4.6), which represents 22% of that population. Among this group, arthritis was the most common health condition, affecting 50% of older people with a profound or severe core activity limitation. Hearing disorders (43%), hypertension (38%), heart disease (30%) and stroke (23%) were also common conditions among this group. For each of these conditions, its prevalence in the population combined with its likelihood of being associated with a profound or severe core activity limitation leads to a considerable burden on the community. For example, 10% of people aged 65 years or over reported a stroke and half of these reported a profound or severe core activity limitation, meaning that 126,200 older people had both a stroke and a profound or severe limitation.

Table 4.6: Most common health conditions among older people with a profound or severe core activity limitation(a), 2003

	With a health condition		With a health condition and a profound or severe core activity limitation		
	Number	Per cent of older people	Number	As per cent of those with the health condition	As per cent of people with a profound or severe limitation
Arthritis and related disorders	893,400	35.8	280,500	31.4	50.0
Hearing disorders	732,900	29.4	242,600	33.1	43.3
Hypertension	927,500	37.1	210,300	22.7	37.5
Heart disease	448,800	18.0	167,000	37.2	29.8
Stroke	252,800	10.1	126,200	49.9	22.5
Vision disorders	205,700	8.2	116,200	56.5	20.7
Back problems	408,900	16.4	112,000	27.4	20.0
Diabetes	304,000	12.2	100,300	33.0	17.9
Dementia and Alzheimer's disease	99,300	4.0	97,300	98.0	17.4
Osteoporosis	221,900	8.9	85,100	38.3	15.2
Problems with speech	78,000	3.1	67,800	86.9	12.1
Depression/mood affective disorders	98,000	3.9	58,400	59.5	10.4
All older people	**2,496,800**	**100.0**	**560,890**	**22.5**	**. .**

(a) The technical appendix in *Australia's Welfare 2005* (AIHW 2005d) provides a detailed definition of terms.

Note: People may have more than one health condition so percentages do not sum to 100.

Source: AIHW analysis of ABS 2003 Survey of Disability, Ageing and Carers confidentialised unit record file.

Each condition in Table 4.6 is clearly more common among older people with a profound or severe core activity limitation than among the general older population; with the exception of hypertension (high blood pressure). For example, the prevalence of dementia and Alzheimer's disease was 17% among older people with a profound or severe limitation compared with 4% among the older population in general.

This survey relies on self-reporting by people or their carers to identify their health conditions, which can result in mis-reporting, particularly when conditions are in their mild or moderate stage or have not yet been diagnosed. This can lead to underestimation of the prevalence of some conditions when compared with prevalence estimates based on clinical assessment.

Hospital use

In 2003–04 there were 2.38 million separations from Australian hospitals for people aged 65 years or over (Table 4.7), representing 35% of all separations. The most common principal diagnosis was care involving dialysis, which is usually related to chronic kidney disease (AIHW 2005f). Other common principal diagnoses were other medical care (for example, radiotherapy sessions, maintenance chemotherapy, palliative care), care involving rehabilitation procedures (for example, cardiac rehabilitation, speech therapy, training in activities of daily living) and 'other cataract' (excludes senile cataract and congenital cataract).

Table 4.7: Hospital separations of older people, by most common principal diagnoses, 2003–04

Principal diagnosis	Aged 65–74	Aged 75–84	Aged 85+	Total 65+	Per cent
Care involving dialysis	202,231	153,229	11,233	366,693	15.4
Other medical care	72,959	37,020	3,783	113,762	4.8
Care involving use of rehabilitation procedures	25,648	42,411	20,367	88,426	3.7
Other cataract	29,460	47,150	10,981	87,591	3.7
Angina pectoris	22,356	20,940	6,112	49,408	2.1
Other malignant neoplasms of skin	16,480	21,948	8,530	46,958	2.0
Other chronic obstructive pulmonary disease	16,165	19,946	5,651	41,762	1.8
Heart failure	7,947	16,542	11,698	36,187	1.5
Pain in throat and chest	15,908	12,209	3,652	31,769	1.3
Type 2 diabetes mellitus	12,574	14,248	3,508	30,330	1.3
Pneumonia, organism unspecified	8,167	12,895	8,792	29,854	1.3
Senile cataract	10,460	15,673	3,536	29,669	1.2
Acute myocardial infarction	10,639	11,941	5,688	28,268	1.2
Follow-up examination for malignant neoplasms	12,895	11,967	2,079	26,941	1.1
Atrial fibrillation and flutter	9,542	10,493	3,493	23,528	1.0
Arthrosis of knee	12,594	9,259	1,214	23,067	1.0
Total	**1,062,168**	**1,002,899**	**313,010**	**2,378,077**	**100.0**

Source: AIHW National Hospital Morbidity Database.

Comparing tables 4.7 and 4.6 indicates that heart diseases, stroke, diabetes and vision problems are among the most common reasons for hospital separations among older Australians and are also among the most common health conditions experienced by older people with a profound or severe core activity limitation. Treatment and management of these conditions tends to include both acute and long-term care.

Care involving dialysis (usually associated with chronic kidney disease) and 'other skin cancer' ('other malignant neoplasms of skin', for example lip, eyelid, ear, scalp and neck) are among the most common principal diagnoses for hospital separation. However, they do not feature among the most common health conditions experienced by people with a profound or severe core activity limitation. Although chronic kidney disease requires long-term care, dialysis often occurs in hospitals. 'Other skin cancer' requires hospital treatment such as surgery but usually not long-term care.

Conversely, hearing disorders, dementia and depression are among the health conditions that most commonly occur among people with a profound or severe core activity limitation but do not feature among the most common principal diagnoses for hospital separations. These conditions are more likely to include long-term care associated with managing the associated disability, rather than acute care.

Dementia

Dementia is a major health problem among older people. It refers to a collection of symptoms that can be caused by a number of diseases that impair the brain. It is marked by the progressive impairment of brain functions such as language, memory, perception, personality and understanding. It restricts daily activities and, in the long term, it leads to the need for care. Many diseases can cause dementia, the most common being Alzheimer's disease, which is responsible for about 70% of cases (AIHW 2004c).

Dementia is the greatest single contributor to the burden of disease due to disability at older ages, as well as the greatest single contributor to the cost of care in residential aged care (AIHW 2004c). Dementia in a person also affects those around them.

It is estimated that in 2004 about 171,000 people aged 65 years or over had dementia (Table 4.8). The estimate for females is greater than that for males because females live longer, and the age-specific rates on which the estimates are based are higher for females in the older age groups. Rates increase markedly with age but, although dementia is common in very elderly people, it is not considered to be an inevitable part of the ageing process.

Table 4.8: Older people with dementia, 2004

	Number			Rate (per cent)		
Age group	**Males**	**Females**	**Persons**	**Males**	**Females**	**Persons**
65–69	4,800	3,600	8,500	1.3	1.0	1.1
70–74	8,600	8,600	17,200	2.8	2.6	2.7
75–79	13,900	19,300	33,300	5.6	6.4	6.1
80–84	15,500	30,200	45,700	10.0	13.1	11.9
85–89	10,200	28,100	38,300	15.5	21.9	19.8
90–94	4,400	16,500	20,900	20.1	29.1	26.6
95+	1,400	5,800	7,200	23.6	33.5	30.9
Total 65+	**58,800**	**112,200**	**171,000**	**5.0**	**7.8**	**6.6**

Note: Derived from aggregated age–sex-specific rates from a meta-analyses 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 2004.

Source: AIHW unpublished.

The estimates of dementia prevalence in Table 4.8 are based on data from numerous international and Australian studies that used clinical or other diagnostic assessment. These studies together are considered to capture all severities of dementia and they produce an estimate of prevalence among Australians aged 65 years or over that is greater than the equivalent estimate based on self-report from the 2003 SDAC (Table 4.6). While the SDAC is considered to capture all severities of dementia in the cared accommodation component of the survey, for the household component it is believed to capture mainly profound or severe cases of dementia and to underestimate mild or moderate cases.

Demand for services is most likely to arise from people whose dementia is associated with profound or severe disability, leaving them unable to carry out core activities of daily living without assistance. Based on diagnostic assessment, the number of people aged 65 years or over in 2004 with dementia who also experienced a profound or severe core activity limitation was estimated to have been 102,100 (AIHW unpublished).

Chalmers and others (2005) reported that the oral health of older people with dementia is significantly worse than that of their unaffected age peers. Most people with dementia also have other long-term health conditions such as gait disturbance, slowed movement, fractures, arthritis, osteoporosis and urinary tract infections. However, for most people with dementia (67%), it is also their main disabling condition.

In summary, dementia is associated with high levels of disability and the need for long-term care is high. Care and organisation of the environment can assist with physical problems such as incontinence, difficulties of food intake and problems in lying down. Although there is no cure for dementia, medication can improve its symptoms. This in turn may improve quality of life, ease the burden on caregivers and delay admission to residential care.

Vision problems

Visual impairment can affect physical, functional, emotional and social wellbeing, and markedly reduce quality of life. The ability to perform basic activities of daily living can be affected, leading to less independence. Visual impairment is often accompanied by isolation, depression and poorer social relationships, and is strongly associated with falls and hip fractures. Preventing and treating visual impairment increases the prospect of enjoying life as a healthy, productive older person.

Based on studies that have included an eye examination, cataract is the most common eye disease among Australians aged 65 or more, affecting over 1.2 million people (almost half of that population). This is followed by age-related macular degeneration (AMD), diabetic retinopathy and glaucoma (Table 4.9). Almost 170,000 Australians aged 65 years or over have visual impairment caused by eye disease. Of these, 51,000 people are classified as blind and almost 119,000 other people have low vision. There is a strong association between visual impairment and advancing age (AIHW 2005i).

Table 4.9: Most prevalent eye diseases and associated visual impairment and blindness among older people, 2004

<table>
<tr><th></th><th colspan="2">Eye disease</th><th colspan="2">Visual impairment</th><th colspan="2">Blindness</th></tr>
<tr><th></th><th>Number</th><th>Rate (%)</th><th>Number</th><th>Per cent</th><th>Number</th><th>Per cent</th></tr>
<tr><td>Cataract</td><td>1,215,400</td><td>46.7</td><td>71,800</td><td>42</td><td>6,600</td><td>13</td></tr>
<tr><td>Age-related macular degeneration</td><td>(a)138,800</td><td>5.3</td><td>50,600</td><td>30</td><td>28,300</td><td>55</td></tr>
<tr><td>Glaucoma</td><td>87,200</td><td>3.3</td><td>13,300</td><td>8</td><td>8,100</td><td>16</td></tr>
<tr><td>Diabetic retinopathy</td><td>97,100</td><td>3.7</td><td>5,400</td><td>3</td><td rowspan="2">8,000</td><td rowspan="2">16</td></tr>
<tr><td>Other</td><td>n.a.</td><td>n.a.</td><td>28,500</td><td>17</td></tr>
<tr><td>Total</td><td>n.a.</td><td>n.a.</td><td>169,600</td><td>100</td><td>51,000</td><td>100</td></tr>
</table>

(a) A further 398,400 older Australians are estimated to have early age-related maculopathy, which usually carries no symptoms, and are therefore at risk of developing age-related macular degeneration.

Notes

1. Visual impairment was defined as visual acuity <6/12 and blindness as visual acuity <6/60. Visual acuity of 6/12 is the ability to see only at 6 metres what the normal eye can see at 12 metres. Visual acuity includes blindness.
2. Refractive error is not included.

Source: AIHW 2005i.

Cataract is the primary cause of 42% of cases of visual impairment in older Australians and AMD the primary cause of 30%. The leading causes of blindness among Australians aged 65 years or over are AMD (55%), glaucoma (16%) and diabetic retinopathy (16%). Uncorrected refractive error, which can be corrected by eyewear, is the cause of visual impairment in a further 204,600 Australians aged 65 years or over.

The estimate for total vision disorders from the 2003 SDAC (Table 4.6) is less than the estimates based on clinical examination (Table 4.9) because of differences in methods and definitions. For example, respondents to the 2003 SDAC who were in the early (symptomless) stages of a condition may not have known they had a condition, which would lead to underestimation when compared with estimates based on an ophthalmological examination.

The availability of successful treatments differs according to the eye disease. There is a simple and effective surgical procedure that restores vision for cataract. There is no cure for AMD but treatment may delay or halt its progress. Medical treatment, laser treatment or surgery can slow the progress of glaucoma but any vision loss cannot be restored. Diabetic retinopathy can be successfully treated by laser surgery if identified early, and laser treatment can be used to prevent severe vision loss and blindness even in advanced cases.

Arthritis and musculoskeletal conditions

Arthritis and musculoskeletal conditions are large contributors to illness, pain and disability among older Australians (AIHW 2005c). Highly prevalent, these conditions have a significant effect on the community, including disruptions to daily life, lost productivity through disability, and the use of hospital and primary care services.

Arthritis covers a diverse group of diseases and conditions marked by pain and stiffness in the joints, which can often produce disability and sometimes deformity. Other musculoskeletal conditions include disorders of the bones, muscles and their attachments to each other.

Based on self-report, the most common form of arthritis—osteoarthritis—affects about 645,000 Australians aged 65 years or over (Table 4.10). The condition mainly affects the hands, spine and weight-bearing joints such as hips, knees and ankles. It usually worsens with time, often limiting a person's movements and daily functioning.

Table 4.10: Prevalence of arthritis and musculoskeletal conditions among older people, 2001

Condition	Males	Females	Persons	Males	Females	Persons
		Number ('000)			Rate ('000)	
Osteoarthritis	209.6	435.6	645.3	208.5	350.9	286.8
Rheumatoid arthritis	64.3	95.6	159.9	63.6	77.0	71.1
Osteoporosis	25.1	154.9	180.0	25.4	124.5	80.6
Other	610.2	664.3	1,274.5	597.6	535.5	564.1
Total	**608.1**	**831.0**	**1,439.1**	**598.3**	**669.6**	**637.6**

Note: The total is smaller than the sum of its components because more than one condition may be reported by the same individual.

Source: AIHW analysis of ABS 2001 National Health Survey.

Rheumatoid arthritis, the most common autoimmune disease in Australia, affects around 160,000 older Australians, a large proportion of whom are females. It involves inflammation of the joints, most often affecting the hand joints in symmetrical fashion, and often producing deformities.

Osteoporosis is a thinning and weakening of the bone substance with a resulting risk of fracture, and it is estimated to affect 180,000 older Australians. Fractures after minimal trauma are a typical sign of osteoporosis. A person's ability to walk unassisted can be affected and a loss of independence may occur.

These estimates differ slightly from those in Table 4.6 because of differences in methods and definitions between the 2003 SDAC and the 2001 NHS. For example, the 2003 SDAC included people residing in non-private dwellings such as residential aged care, whereas the 2001 NHS did not.

Strategies for treating osteoarthritis include pain control, improving functioning and health-related quality of life, and total joint replacement. Treatment of rheumatoid arthritis focuses on early diagnosis and controlling the symptoms of chronic inflammation. Management of osteoporosis includes treatments that reduce fracture risk, and lifestyle changes including appropriate nutrition and exercise.

4.5 Aboriginal and Torres Strait Islander peoples

Aboriginal and Torres Strait Islander people suffer much more ill health than other Australians. They die at much younger ages and are more likely to experience disability and reduced quality of life due to ill health (ABS & AIHW 2005). This is clear despite a continuing need to improve information about Indigenous health.

Data from a number of sources indicate that the Indigenous population is disadvantaged across a range of socioeconomic factors that affect health. In 2002, Aboriginal and Torres Strait Islander people reported lower incomes than other Australians, higher rates of unemployment, poorer education achievements and lower rates of home ownership (ABS 2004c).

However, measurements of socioeconomic status alone do not explain all the variations in health status that exist between Indigenous and non-Indigenous Australians. Higher levels of health risk behaviours such as smoking and alcohol misuse, and other risk factors such as poor housing and exposure to violence are also important determinants of Indigenous health. Numerous other aspects of the living and social conditions of Indigenous Australians, along with a reduced sense of control over their own lives, may help explain their generally poor health.

This section discusses data sources used to compile the health information on Aboriginal and Torres Strait Islander peoples and some problems with the data quality; it then describes their demographic profile 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 drinking 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 Aboriginal and Torres Strait Islander peoples over the last decade, but many analytical and conceptual challenges remain. This is partly due to incomplete identification of Indigenous people in administrative records and partly to the statistical and practical challenges of surveying a population that is small—2.4% of the total population—and also has a relatively high 'remote area' component. A greater effort to improve the coverage of Indigenous Australians in a range of administrative data sets continues to be a key strategy towards better quality information about their health.

The coverage of Indigenous people in birth registration is improving, but Indigenous deaths 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.

The extent of under-counting of Indigenous people in records of hospital use or general practice consultations is not known. Currently, hospitalisation data from Queensland, Western Australia, South Australia and the Northern Territory are considered sufficient for indicative information on hospital use. Other sources of data that can be used include the community-controlled and other Aboriginal health services, disease registers and national household surveys with Aboriginal and Torres Strait Islander-specific surveys. Such data sources provide useful information on specific diseases, risk factors and living conditions.

The Indigenous population

The Indigenous population in Australia was estimated to be 458,520 at 30 June 2001, comprising 2.4% of the total Australian population. Their number is projected to have grown to between 492,700 (low series projection) and 525,000 (high series projection) by mid-2005.

In 2001, around 90% of Indigenous people were identified as being of Aboriginal origin, 6% as being of Torres Strait Islander origin and 4% as being of both Aboriginal and Torres Strait Islander origin. The majority of Indigenous people live in urban areas but 26% live in remote or very remote areas, compared with 2% of the non-Indigenous population (ABS 2003c).

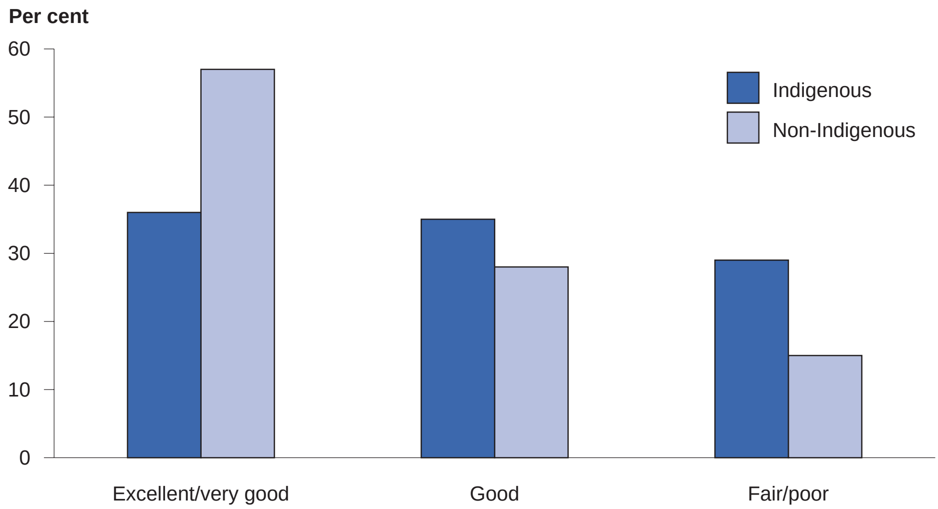
The Indigenous population is considerably younger than the non-Indigenous population. In 2001, the median age for Indigenous people was 21 years, compared with a median age of 36 years for the non-Indigenous population. Fertility is higher for the Aboriginal and Torres Strait Islander population, and Indigenous females tend to give birth at younger ages than non-Indigenous females. In 2001–2003, 78% of Indigenous mothers had babies before the age of 30 years compared with 49% of non-Indigenous mothers (ABS & AIHW 2005).

The estimated life expectancy at birth for Aboriginal and Torres Strait Islander peoples is much lower than for other Australians. 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 respectively to the life expectancy of 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.

Measures of health status

Self-assessed health status

Self-assessed health status provides an indication of a person's overall health, reflecting an individual's perception of his or her own health. In 2004–05, 29% of Indigenous Australians reported their health as fair or poor—nearly double the rate for non-Indigenous Australians (Figure 4.8). This is after adjusting for differences in the age structure of the two groups. It should be noted that self-assessed health status can depend on a person's awareness and expectations about their health, so it may be influenced by access to health information and services.



Note: Percentages are adjusted for differences in age structure between Indigenous and other Australians.
Source: ABS 2006b, 2006c.

Figure 4.8: Self-assessed health status of Australians aged 15 years or over, 2004–05

Social and emotional wellbeing

The 2004–05 National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) collected information on the social and emotional wellbeing of Indigenous adults aged 18 years and over, using selected questions from the SF-36 and the Kessler Psychological Distress Scale. Questions were also asked regarding feelings of anger, the impact of psychological distress, stressors, and cultural identification.

More than half the adult Indigenous population reported being happy (71%), calm and peaceful (56%) and/or full of life (55%) all or most of the time, while just under half (47%) said they had a lot of energy all or most of the time. Indigenous people living in remote areas were more likely to report having these positive feelings.

Almost one in 10 Indigenous adults (9%) reported feeling nervous all or most of the time. When asked how often they felt without hope, 7% said that they had this feeling, and 7% said that they felt so sad that nothing could cheer them up. A high proportion of the Indigenous population reported feeling restless (12%) and/or that everything was an effort all or most of the time (17%) (ABS 2006c).

Prevalence of conditions

Information about the self-reported prevalence of various conditions among Aboriginal and Torres Strait Islander peoples is available from the 2004–05 NATSIHS. In 2004–05, eye/sight problems, musculoskeletal problems and diseases of the respiratory and circulatory systems were the most commonly reported conditions. On the basis of these self-reports and after adjusting for age, Indigenous Australians had a higher prevalence of most types of health conditions than other Australians (Table 4.11).

Table 4.11: Prevalence of selected conditions among Indigenous and non-Indigenous people, 2004–05 (per cent)[(a)]

Condition	Indigenous	Non-Indigenous
Eye/sight problems	47	51
Musculoskeletal diseases	33	30
Arthritis	17	15
Diseases of the respiratory system	30	29
Asthma	16	10
Circulatory problems/diseases	22	17
Endocrine, nutritional and metabolic diseases	18	11
Diabetes mellitus	12	4
Diseases of the nervous system	9	8
Digestive diseases	6	7
Total number[(b)]	**359,000**	**14,702,000**

(a) Proportions have been age-standardised using the estimated resident population of Australia as at 30 June 2001.

(b) Total numbers have been weighted using ABS population estimates.

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

Sources: ABS 2006b, 2006c.

Consultations with general practitioners

Information about GP consultations is available from the Bettering the Evaluation and Care of Health (BEACH) survey. Each year the survey collects information from a random sample of approximately 1,000 GPs, each recording 100 consecutive consultations. Over the period 1998–99 to 2002–03, there were 5,476 GP consultations with Aboriginal and Torres Strait Islander patients recorded in the survey, representing 1.1% of total GP consultations. Indigenous people present to GPs with essentially the same range of problems as non-Indigenous Australians (Table 4.12). The rate of consultation of Indigenous patients with GPs is likely to be an underestimate of the true overall rate of consultations. This is because GPs do not commonly ask about Indigenous status, or patients may choose not to identify themselves as being of Aboriginal or Torres Strait Islander origin.

Hospitalisations

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. In Queensland, Western Australia, South Australia and the Northern Territory, for the period 2002–03 to 2003-04, the most common diagnosis for Indigenous Australians using hospitals was care involving dialysis, describing 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 psychoactive substance use).

Table 4.12: Selected problems managed at GP consultations, 1998–99 to 2002–03

	Number per 100 consultations	
Type of problem	**Indigenous Australians**	**Total**
Respiratory	22.5	21.7
Skin	16.3	16.6
Musculoskeletal	13.6	17.4
Psychological	13.4	11.3
Circulatory	13.0	16.6
Endocrine and metabolic (including diabetes)	13.0	9.9
Digestive	10.4	10.0
Pregnancy, family planning	6.6	4.3
Ear	5.9	4.3
Other	32.9	35.9
Total problems[a]	**147.7**	**148.1**

(a) Totals may not add to the sum of the components as more than one problem can be managed at each consultation. Between 1998–99 and 2002–03 there were a total of 8,086 and 743,625 problems managed for Indigenous and non-Indigenous people respectively.

Source: Britt et al. 2003.

Hospitalisation rates for Indigenous Australians were higher than for other Australians for most diagnoses (Table 4.13). They were hospitalised for care involving dialysis at 17 times the rate of other Australians, and for endocrine, nutritional and metabolic diseases, which includes diabetes, at 4 times the rate.

Table 4.13: Hospitalisations of Indigenous Australians, by principal diagnosis, 2002–03 to 2003-04

Principal diagnosis (ICD-10-AM chapter)	Observed hospitalisations	Expected hospitalisations	Ratio[a]
Care involving dialysis	128,684	7,755	17
Injury & poisoning & certain other consequences of external causes	25,258	11,341	2
Diseases of the respiratory system	22,549	8,845	3
Diseases of the digestive system	14,955	16,563	1
Mental and behavioural disorders	10,881	6,104	2
Symptoms, signs and abnormal clinical and laboratory findings, nec	11,459	7,055	2
Diseases of the circulatory system	9,818	4,472	2
Diseases of the genitourinary system	8,017	7,018	1
Diseases of the skin & subcutaneous tissue	7,970	2,680	3
Certain infectious and parasitic diseases	7,700	3,003	3
Endocrine, nutritional and metabolic diseases	6,325	1,786	4
Other[b]	34,862	40,352	1
Total[c]	**312,333**	**131,360**	**2**

(a) Ratio = observed hospital separations divided by expected hospital separations. Expected separations 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, 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 Qld, WA, SA and NT.

Source: AIHW National Hospital Morbidity Database.

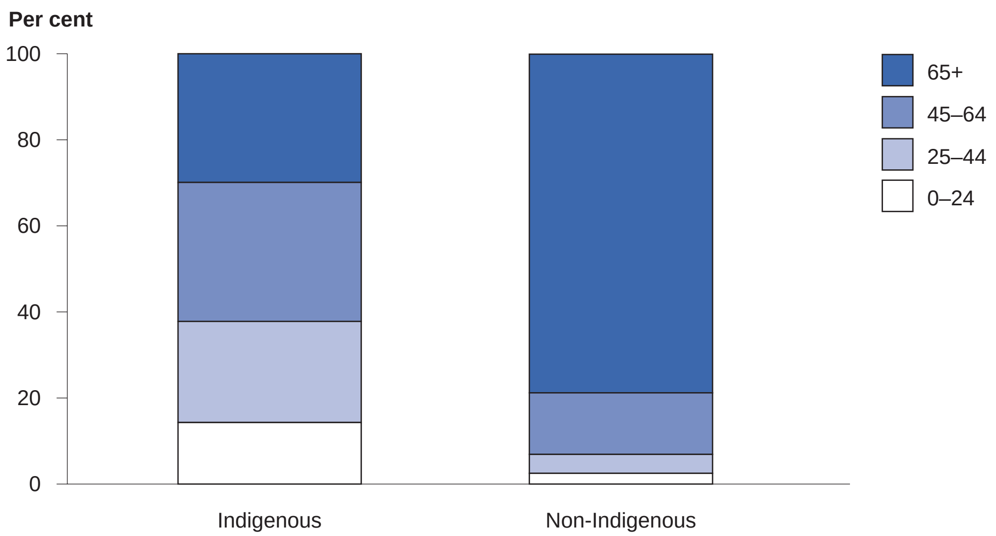
Disability

The 2002 National Aboriginal and Torres Strait Islander Social Survey (NATSISS) provided information on the prevalence of disability among Indigenous Australians for the first time. From the survey it was estimated that 102,900 (37%) of Indigenous persons aged 15 years or over 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 that they always or sometimes needed assistance with at least one activity of everyday living (self-care, mobility or communication). Overall, the proportion of Indigenous people with a disability or long-term health condition was similar in males (37%) and females (36%). This rate increased with age for both sexes. Of Indigenous people aged 65 years or over, 77% of males and 69% of females had a disability or long-term health condition.

Higher rates of profound or severe core activity limitations are experienced by Indigenous people. In non-remote areas, the age-standardised rate ratio of those aged 18 years or over with a profound or severe core activity limitation was 2.1 times that of the non-Indigenous population.

Mortality

In the four jurisdictions which are considered to have the most complete coverage of Indigenous deaths—Queensland, South Australia, Western Australia and the Northern Territory—approximately 70% of Indigenous Australians who died in the period 2000–2004 were younger than 65 years. This is in stark contrast to the non-Indigenous population, where the corresponding proportion was 21% (Figure 4.9).

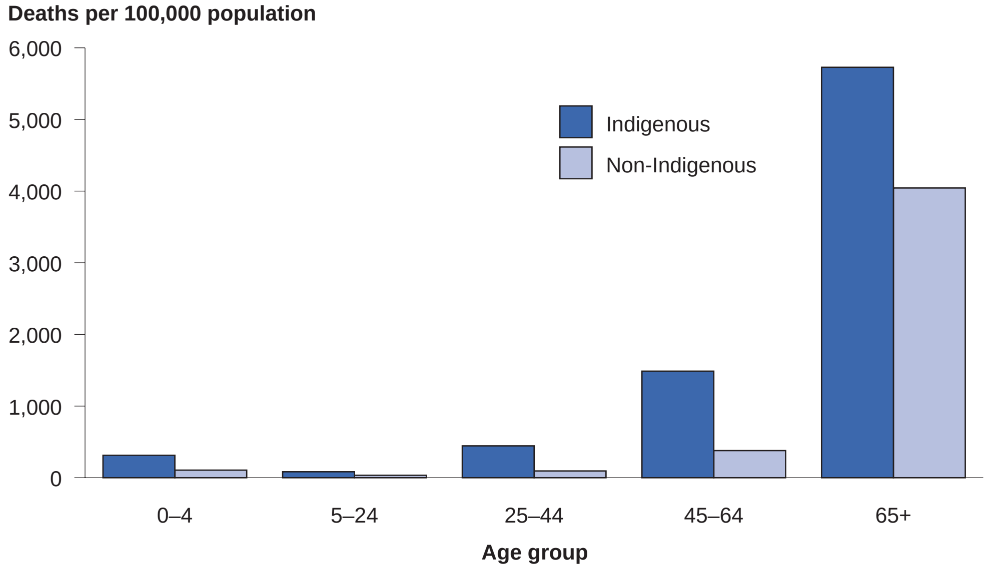


Note: Data for Qld, WA, SA and NT combined. Based on year of registration of death.

Source: AIHW National Mortality Database.

Figure 4.9: Age distribution of deaths among Indigenous and non-Indigenous people, 2000–2004

The overall age-standardised death rates were almost 3 times as high for both Indigenous males and females as among the non-Indigenous population. In addition, all-cause death rates for Indigenous males and females were higher, twice as high or more, across all age groups than those for non-Indigenous males and females. The greatest differences occurred among those in the 25–44 and 45–64 age groups, where the ratio was at least four (Figure 4.10).



Note: Data for Qld, WA, SA and NT combined. Based on year of registration of death.

Source: AIHW National Mortality Database.

Figure 4.10: Age-specific mortality rates among Indigenous and non-Indigenous people, 2000–2004

Indigenous people had death rates in excess of the non-Indigenous population for almost all causes of death. In 2000–2004, the three leading causes for Aboriginal and Torres Strait Islander peoples resident in Queensland, South Australia, Western Australia and the Northern Territory were diseases of the circulatory system, external causes of morbidity and mortality (mainly accidents, intentional self-harm and assault) and neoplasms (cancer). Deaths due to these causes accounted for 58% of all Indigenous deaths compared with 73% among the non-Indigenous population. However, the Indigenous death rates for all these three main groups of causes were markedly higher than for non-Indigenous people. Furthermore, Indigenous males and females died at 8 and 11 times the rates for non-Indigenous males and females respectively from endocrine, nutritional and metabolic diseases, caused mainly by diabetes mellitus (Table 4.14).

Table 4.14: Ratio of Indigenous to non-Indigenous mortality rates, 2000–2004

	Standardised mortality ratio[(a)]	
Cause of death	**Males**	**Females**
Diseases of the circulatory system	3.1	2.6
External causes	2.8	3.3
Neoplasms (mainly cancers)	1.5	1.5
Endocrine, nutritional and metabolic diseases	7.5	10.6
Diseases of the respiratory system	4.1	3.7
Diseases of the digestive system	5.2	4.7
Symptoms, signs and abnormal clinical and laboratory findings, nec	6.2	5.2
Diseases of the genitourinary system	4.8	7.1
Certain conditions originating in the perinatal period	2.8	2.4
Diseases of the nervous system	2.6	1.6
Mental and behavioural disorders	6.0	2.5
Certain infectious and parasitic diseases	5.0	5.3
All causes[(b)]	**2.6**	**2.9**

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

(b) Observed deaths from all causes were 4,308 and 3,251 for males and females respectively. Expected deaths from all causes were 1,458 and 1,133 for males and females respectively.

Note: Data for Qld, WA, SA and NT combined. Deaths are based on year of registration of death. Disease groupings are based on ICD-10 chapter.

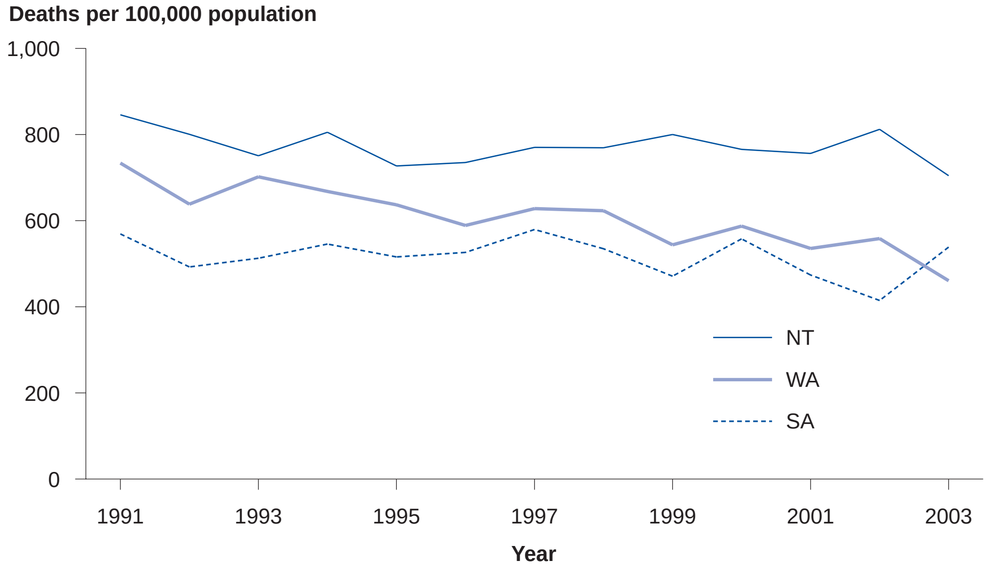
Source: AIHW National Mortality Database.

Trends in mortality

An analysis of trends in mortality showed that between 1991 and 2003, there were statistically significant declines in overall Indigenous mortality in Western Australia for both males and females (Figure 4.11). For males, the fitted trend for the crude death rate implies an average yearly decline in recorded deaths of around 17 deaths per 100,000 population. This is equivalent to a reduction in the crude death rate of around one-quarter during the period of analysis. For females, the corresponding decline was around 15 deaths per 100,000 population, also equivalent to a fall of around one-quarter. During the same period, the fitted trend for crude death rates in South Australia (males, females and persons) and the Northern Territory (females and persons) showed declines in recorded deaths but they were not statistically significant.

Of the five main causes of death examined—neoplasms; endocrine, nutritional and metabolic diseases; diseases of the circulatory system; diseases of the respiratory system; and injury—only mortality from diseases of the circulatory system showed a consistently significant decline among Indigenous Australians.

There was also a significant decline in infant mortality in Western Australia, South Australia and the Northern Territory over the same period (Table 4.15).



Note: Based on year of occurrence of death. Data are for WA, SA and NT.

Source: AIHW National Mortality Database.

Figure 4.11: Indigenous crude death rates, 1991–2003

Table 4.15: Indigenous infant mortality rates[(a)], 1991–2003 (deaths per 1,000 live births)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
WA[(b)]	20.8	22.8	16.3	20.3	22.1	18.9	19.0	17.0	16.7	13.9	16.9	15.5	11.9
SA	16.9	25.0	13.5	7.5	16.2	14.4	8.5	4.5	6.3	11.1	8.2	11.8	6.9
NT	25.5	28.1	25.8	21.7	17.0	24.6	23.8	21.0	28.2	17.0	16.0	13.0	12.9

(a) Data are for WA, SA and NT.

(b) The average of births over 1993–1995 in WA was used to as the denominator for the estimates of the infant mortality rates for 1991 and 1992 to correct for errors in births recorded for 1991 and 1992.

Note: Deaths are based on year of occurrence and state or territory of usual residence. Births are based on year of registration.

Sources: ABS 1999, 2004a; AIHW National Mortality Database.

Health risk factors

Low birthweight

Babies born with a birthweight of less than 2,500 grams are classified as 'low birthweight'. In the period 2000–2002, babies of Indigenous mothers were about twice as likely to be of low birthweight as babies born to non-Indigenous mothers (13% compared to 6%). Low-birthweight babies have a greater risk of poor health and of dying. They may require longer periods of hospitalisation after birth, and are more likely to develop significant disabilities (Leeson et al. 2001; Mick et al. 2002).

Low birthweight may be a result of pre-term birth, fetal growth restriction or other factors. These include the age of the mother, the number of babies previously born, the mother's nutritional status, smoking and other risk behaviours and illness during pregnancy (Mackerras 2001; Singh & Hoy 2003).

Obesity

Self-reported results from the 2004–05 NATSIHS indicate that in each age group Indigenous males and females were more likely to be obese than other Australians (ABS 2006c). The high level of obesity puts the Indigenous population at greater risk for Type 2 diabetes, cardiovascular diseases and other chronic conditions. The 2004–05 NATSIHS also found that 50% of adult Indigenous Australians living in non-remote areas undertook no physical activity in the two weeks prior to the survey, compared with 30% of non-Indigenous respondents living in non-remote areas.

Poor nutrition

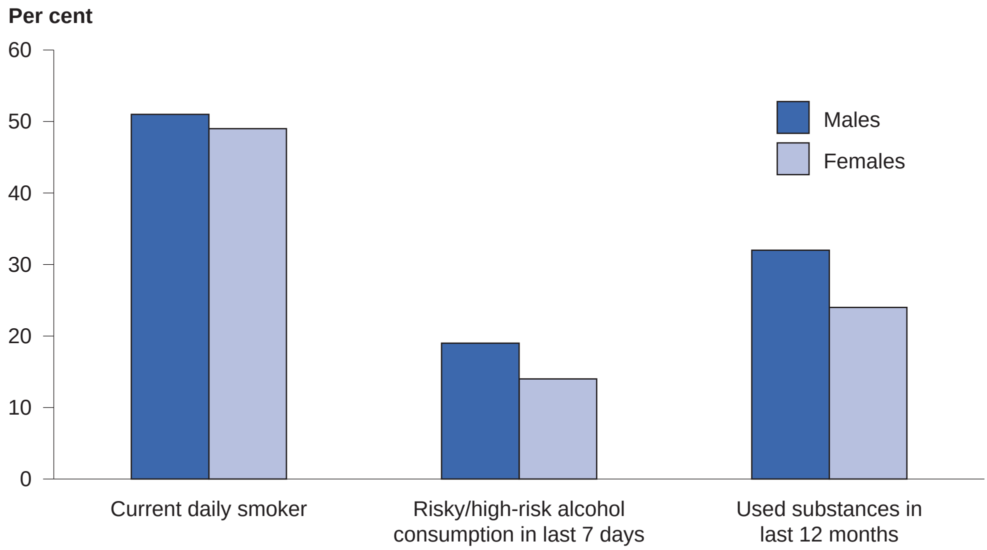
The most recent results from the 2004–05 NATSIHS indicate that less than half of Indigenous adults have a medium to high level of fruit intake—from self-reports an estimated 45% of Indigenous adults had two or more serves of fruit per day, compared with 54% of non-Indigenous adults. Since colonisation, the diet of many Aboriginal and Torres Strait Islander people has changed from a fibre-rich, high protein, low saturated fat 'traditional' diet 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, excessive alcohol consumption and illicit drug use

According to the 2004–05 NATSIHS half (50%) of the Indigenous population aged 18 years or over were daily cigarette smokers (Figure 4.12). A similar proportion of the males (51%) and females (49%) were daily smokers with the highest rates reported by those aged 25–44 years. Results from the 2004–05 NATSIHS indicate that 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 2006b, 2006c).

The 2004–05 NATSIHS results suggest that of those who drank in the seven days prior to the survey, approximately one in six Indigenous people (16%) aged 18 years or over had a level of alcohol consumption that is classified as risky/high-risk, based on the reported frequency and amount of alcohol usually consumed (Figure 4.12). The rate of risky/high-risk consumption was higher for Indigenous males than for females and was highest among those aged 35–44 years (19%).

Indigenous people are also at risk of ill health through the use of substances such as marijuana, heroin, amphetamines and inhalants. In 2004–05, an estimated 28% of Indigenous people aged 18 years or over in non-remote areas had recently used an illicit substance and 50% had tried at least one illicit substance in their lifetime (Figure 4.12). There are no reliable national data on petrol sniffing, but case studies indicate that the practice continues to be a major problem in some Indigenous communities (d'Abbs & Brady 2003; d'Abbs & MacLean 2000).



Note: Data for 'Used substances in last 12 months' are for persons aged 18 years or over and in non-remote areas only.

Source: ABS 2006c.

Figure 4.12: Smoking, risky alcohol consumption and substance use by Indigenous Australians aged 18 years or over, 2004–05

Housing and living conditions

Adequate housing is a major factor affecting health. Many Indigenous people live in housing conditions that are overcrowded and that are unacceptable by general Australian standards because they do not satisfy the basic requirements of shelter, safe drinking water and adequate waste disposal.

According to the 2001 Census of Population and Housing, an estimated 10% of Indigenous households (13,380 dwellings) in Australia were overcrowded. This translates to an estimated 80,370 (22%) Indigenous people living in overcrowded accommodation. Overcrowding varied significantly by tenure type, with the highest among households in mainly Indigenous community housing. About one-third (34%) of Indigenous households and over one-half of Indigenous people (57%) renting mainly from Indigenous community housing organisations were living in overcrowded conditions (Table 4.16).

Overcrowding can put excessive demand on bathroom, kitchen and laundry facilities as well as on sewerage systems such as septic tanks. It can lead to the spread of infectious diseases such as meningococcal meningitis or septicaemia, tuberculosis, rheumatic fever and respiratory diseases and skin infections (Bailie & Runcie 2001). It has also been associated with poorer self-reported physical and mental health, and higher rates of smoking and hazardous drinking (Waters 2001).

Table 4.16: Indigenous persons living in overcrowded conditions and Indigenous households, by tenure type, 2001

	Persons[(a)]		Households[(a)]	
Tenure type	**Number**	**Per cent**	**Number**	**Per cent**
Home owner/purchaser	8,110	8.3	2,160	4.7
Renter (state/territory housing authority)	14,500	17.5	2,660	9.1
Renter (Indigenous/mainstream community housing)	44,040	57.3	5,320	34.0
Private and other renter	11,330	11.6	2,840	6.1
Total[(b)]	80,370	22.2	13,380	9.5

(a) Excludes dwellings where the number of bedrooms was not stated.

(b) Includes 'other' and 'not stated'.

Source: ABS & AIHW 2005.

The 2001 Community Housing and Infrastructure Needs Survey (CHINS) collected more detailed data on dwelling conditions for permanent dwellings on discrete Indigenous communities that were managed by Indigenous housing organisations. The survey identified 21,287 permanent dwellings managed by Indigenous housing organisations. The majority of these dwellings (70%) were located in areas classified as Remote or Very Remote areas. Of these, 2,914 (19%) required major repairs and 1,461 (10%) required replacement (ABS & AIHW 2005).

Inadequate basic utilities such as facilities for washing clothes, sewerage systems or safe drinking water have all been associated with higher rates of infectious and parasitic diseases. The CHINS survey collected information on main source of water, sewerage and electricity for all discrete communities. While the majority of permanent dwellings were on communities where the main source of drinking water was bore water, there were 214 permanent dwellings in communities where the main source of water was a well or spring and 13 in communities that had no organised water supply. Similarly, there were approximately 80 permanent dwellings in communities with no organised electricity supply and 153 in communities with no organised sewerage system.

4.6 Socioeconomically disadvantaged people

Although there have been significant health improvements for Australians in recent decades, these have not been distributed equally across all sections of the population. People who are poorer or socioeconomically disadvantaged in other ways generally live shorter lives and suffer more illness and reduced quality of life than those who are well-off. This social gradient in health is apparent for both males and females and across all age groups and countries where data exist, no matter how socioeconomic disadvantage is measured (Turrell & Mathers 2000; Wilkinson & Marmot 2003).

Socioeconomic disadvantage has many forms, and can be absolute or relative. It may include lower income, poorer education, unemployment, limited access to services, inadequate housing, or an unrewarding or menial job. Lack of personal relationships or social networks and lack of funds in retirement are other examples. Alone or in combination, and over time, these stressful economic and social circumstances can have an effect on health and wellbeing.

Measures of socioeconomic position can be constructed for occupation, income, education and other indicators, and linked to health outcomes. Composite measures of socioeconomic status have also been devised. One such measure is the Index of Relative Socioeconomic Disadvantage (IRSD), derived by the Australian Bureau of Statistics (ABS) from population census data, and commonly used to measure health inequalities (ABS 2003b). It scores persons based on a range of composite attributes for their area of residence including average levels of income, educational attainment and unemployment.

One study has suggested that with respect to the variations in health status that occur according to where people live, income and employment status play a major role and risk factors and other demographic variables account for some part of the remainder (Mathers 1994).

Socioeconomic disadvantage, risk factors and illness

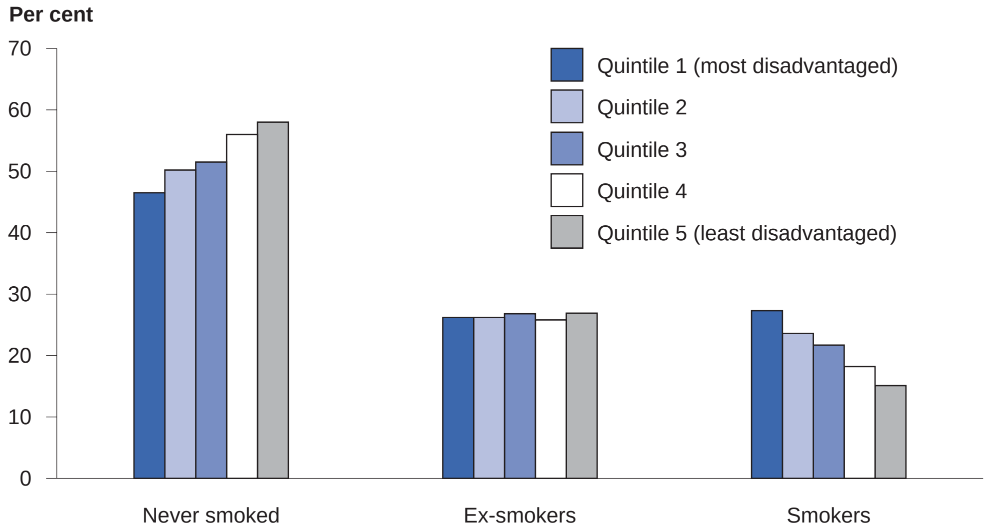
The nature of socioeconomic disadvantage as a risk factor for ill health and its interaction with other health risk factors has already been discussed in Chapter 3.

An analysis of results from three ABS National Health Surveys for the periods 1989–90, 1995 and 2001 shows that persons aged 25–64 years living in socioeconomically disadvantaged areas are more likely to assess their own health as fair or poor, drink alcohol at harmful levels (males), smoke, be obese and have raised blood pressure (Turrell et al. 2006). These are variously risk factors for a number of major health conditions such as cardiovascular and respiratory diseases, as well as lung and other cancers.

More recent data for 2004 show that 27% of persons living in the most disadvantaged areas smoke, compared with 15% of persons living in the least disadvantaged areas. Proportions smoking increase regularly with the degree of socioeconomic disadvantage (Figure 4.13).

Higher rates of arthritis, bronchitis and emphysema, and diabetes were estimated from the self-reports of socioeconomically disadvantaged persons in the same surveys. More specifically, the self-reported prevalence of rheumatoid arthritis and osteoporosis declines with increasing social advantage (AIHW 2005c). In addition, chronic kidney disease is associated with lower socioeconomic status, and this is considered to be through its association with risk factors such as smoking, high blood pressure, diabetes and streptococcal skin or throat infections, as well as through reduced access to services for diagnosis and treatment (AIHW 2005f).

Persons living in socioeconomically disadvantaged areas also reported consulting doctors more often, but dentists less often. Females living in these areas were also less likely to report having had a recent Pap smear.



Source: AIHW 2005a.

Figure 4.13: Smoking status of persons aged 14 years or over, by quintile of socioeconomic disadvantage, 2004

Analysis of hospitalisations for cardiovascular disease among persons aged 25–74 years during 2003–04 shows a consistent socioeconomic gradient, with rates for males in the most disadvantaged group 24% higher than for males in the least disadvantaged group. Among the most disadvantaged females, the rate of hospitalisation was 32% higher (AIHW: Moon & Waters in press).

Life expectancy and death

Life expectancy also varies with socioeconomic status. In 2000–01, a boy born in an area of greatest disadvantage could expect to live 3.6 years less than a boy born in an area of least disadvantage. A girl born in an area of greatest disadvantage could expect to live 2.4 years less. For persons aged 65 years, males living in the most disadvantaged areas could expect to live 1.6 years less, and females 1.3 years less (Table 4.17).

Table 4.17: Life expectancy at birth and at age 65, by quintile of socioeconomic disadvantage, 2000–01 (years)

	Quintile 1 (most disadvantaged)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (least disadvantaged)
Life expectancy at birth					
Males	76.2	77.0	77.6	78.5	79.8
Females	82.1	82.8	83.0	83.5	84.5
Life expectancy at age 65					
Males	17.0	17.5	17.7	18.0	18.6
Females	20.8	21.2	21.2	21.4	22.1

Source: AIHW 2005d.

The relationship between mortality and socioeconomic disadvantage in Australia is well documented, with people from lower socioeconomic groups having higher rates of mortality overall and for most causes of death (Draper et al. 2004). In 1998–2000, the death rate for males aged 25–64 years living in areas of most disadvantage, compared to males living in areas of least disadvantage, was:

- 1.8 times as high overall
- 1.5 for cancer
- 2.0 for lung cancer
- 2.1 for a disease of the circulatory system
- 1.9 for stroke
- 2.8 for a disease of the respiratory system
- 2.2 for traffic accidents
- 1.6 for suicide.

For females, the inequalities are similar to those of males:

- 1.5 times as high overall
- 1.2 for cancer
- 1.7 for lung cancer
- 2.3 for a disease of the circulatory system
- 1.8 for stroke
- 2.4 for a disease of the respiratory system
- 2.0 for traffic accidents
- 1.3 for suicide.

In the same study, boys aged less than 1 year born in areas of greatest socioeconomic disadvantage had a death rate 1.8 times as high as boys born in areas of least disadvantage. Among girls, the corresponding rate ratio was 1.6.

Similarly, there is an inverse social gradient in diabetes-related deaths. In 2001–2003, diabetes-related mortality in the most disadvantaged areas was 82% higher than in the least disadvantaged areas (AIHW: Dixon & Webbie 2005). However, there were no significant socioeconomic variations in breast cancer mortality rates among females (Draper et al. 2004).

4.7 Overseas-born people

Australia has one of the largest proportions of immigrant populations in the world, with 24% of the total population (4.75 million people) in 2004 estimated to have been born overseas. More than half of these—one in eight 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, 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 persons 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 (Hyman 2001).

Certain health risk factors and diseases are, however, more prevalent among some country-of-birth groups, reflecting diverse socioeconomic, cultural and genetic influences. It has also been observed that the migrant health advantage may diminish with length of stay (Fennelly 2005). These themes are explored in this section.

Death and hospitalisation

Rates of death for major country-of-birth groups are compared with persons born in Australia in Table 4.18. In 2001–2003, the death rate for persons born overseas was 7% below that for persons born in Australia. But rates varied markedly by country—people born in Vietnam had death rates half those of Australian-born persons, 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, the Netherlands and New Zealand, were similar to the Australian-born death rate.

Table 4.18: Standardised mortality ratios[(a)] by selected causes of death and countries of birth, persons aged 15 years or over, 2001–2003

Country of birth	Colorectal cancer	Lung cancer	Diabetes mellitus	Ischaemic heart disease	Cerebro-vascular disease	Intentional self-harm	All causes of death[(b)]
China	0.78*	0.88	1.07	0.54*	0.85*	0.68*	**0.70***
Croatia	1.07	1.45*	2.31*	1.14	1.29*	1.04	**1.11***
Germany	0.88	1.11	1.34*	1.00	0.91	0.98	**0.97**
Greece	0.63*	0.77*	1.36*	0.79*	0.81*	0.97	**0.80***
India	0.64*	0.70*	1.37*	1.02	0.88	0.45*	**0.85***
Italy	0.91	0.91*	1.63*	0.82*	0.79*	0.55*	**0.87***
Netherlands	0.81*	1.46*	1.00	0.91	0.81*	0.80	**0.97**
New Zealand	1.06	0.99	0.82	0.96	0.98	1.14	**0.93***
Philippines	0.38*	0.69*	1.32	0.51*	0.81*	0.27*	**0.59***
Poland	1.02	1.12	1.34*	1.17*	0.99	1.07	**1.04***
UK & Ireland	0.82*	1.30*	0.91*	1.00	0.93*	1.01	**1.01**
Vietnam	0.38*	0.80*	0.58*	0.29*	0.68*	0.57*	**0.52***
All overseas	**0.80***	**1.08***	**1.23***	**0.94***	**0.90***	**0.81***	**0.93***
All deaths	*13,840*	*21,312*	*9,789*	*77,714*	*36,890*	*6,954*	*388,862*

* Statistically different from 1.00 at the 5% level.

(a) The standardised mortality ratio in this table is a measure of the death rate from a specific condition in the overseas-born population relative to the Australian-born population. If the ratio were 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 at 30 June 2001.

(b) Includes all other causes of death.

Source: AIHW National Mortality Database.

Death rates among people born overseas also varied by cause of death. Whereas for many causes the death rates were lower than for Australian-born people, lending support to the 'healthy migrant effect', 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 United Kingdom and Ireland, the Netherlands and Croatia
- diabetes among people born in Germany, Italy, Croatia, Greece, Poland and India
- ischaemic (coronary) heart disease among people born in Poland
- cerebrovascular disease (including stroke) among people born in Croatia.

Overseas-born persons are also admitted to hospital at lower rates than the Australian-born population. In 2003–04, the age-standardised total separation rate for Australian-born patients was 20% higher than for the overseas-born population (353.0 versus 278.4 per 1,000 population) (AIHW 2005e).

Despite this, persons from overseas countries are hospitalised at significantly higher rates for a number of health conditions. These conditions, and the countries of birth displaying these higher rates, include:

- tuberculosis—India, Vietnam, Philippines, China
- lung cancer—United Kingdom and Ireland
- diabetes mellitus—Greece, India, Italy, Vietnam
- heart attack—India
- heart failure—Italy, Greece, Poland
- gastritis and duodenitis—Vietnam, China, Greece, Croatia, Italy, Poland
- gallstones—Philippines
- kidney stones—Italy, Greece, Croatia, Poland
- enlarged prostate—Italy
- dialysis—Greece, Italy, Vietnam, Philippines, Croatia, India.

Consistent with their population numbers, overseas-born patients represented nearly one-quarter of all hospitalisations in 2003–04 (1,622,244 separations, or 24%). Some 66% of these occurred in public sector hospitals, as opposed to 61% for patients born in Australia. Upwards of 80% of hospital patients born in Turkey, Lebanon and Vietnam received treatment in a public hospital. The figure for patients born in South Africa, the United States and Japan was less than 50% (AIHW 2005e).

Focus: diabetes

In Australia, some country-of-birth groups suffer disproportionately from certain diseases in comparison to other Australians. One such disease is Type 2 diabetes. Diabetes prevalence, hospitalisation and mortality are higher among those born in

Southern Europe, Eastern Europe, the Pacific Islands, South-East Asia, China, and the Middle East and North Africa (AIHW: Dixon & Webbie 2005).

In 2001, around 35% of Australians who reported having diabetes were born overseas. Males born in the Middle East and North Africa had a diabetes prevalence rate 3.6 times that of Australian-born males. The corresponding ratio for females was 2.4 (AIHW: Holdenson et al. 2003). Other recent studies have found that the incidence of Type 2 diabetes among Greek and Italian migrants was more than 3 times that of Australian-born individuals (Hodge et al. 2004). Among Australian descendants of Pacific Islanders in Mackay, Queensland, diabetes was diagnosed in 8% of all respondents, with prevalence rising to one-fifth of persons aged 45 years or over (FECCA 1997). This compares with an estimate of 7.6% for the total Australian population in 2001 (AIHW 2004a).

Genetic, environmental and lifestyle risk factors play a part in diabetes, and for migrants the changes in diet and physical activity have been implicated in their increased risk (AIHW 2002). Although country of birth cannot be modified, other risk factors can—such as obesity, poor diet and insufficient physical activity.

Among those with diabetes, some overseas-born Australians may also be at higher risk of diabetes-related complications than the Australian-born population. This may be partly a result of barriers to accessing health care services for their diabetes that they encounter due to language or culture (AIHW: Thow & Waters 2005).

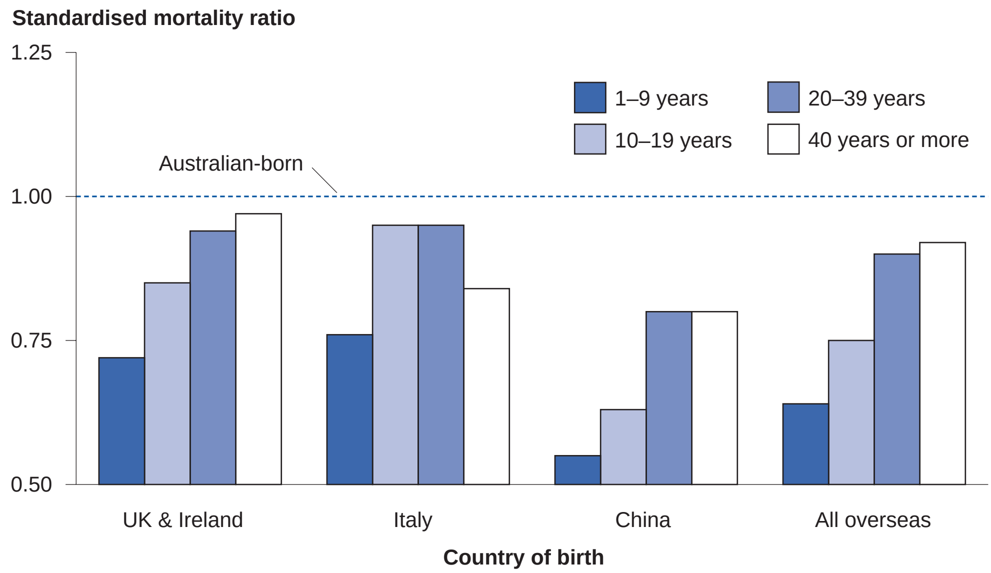
Acculturation and loss of health advantage

As length of residence in a destination country increases, the health status of immigrants—as gauged by health behaviours and by morbidity and death rates—tends to converge towards that of the native-born population.

This is illustrated in Figure 4.14, which shows that as length of residence in Australia increases, death rates among those born overseas increase and approach those of Australian-born persons (indicated by a standardised mortality ratio of 1.00). After two to four decades of residence, standardised mortality ratios tend not to increase with further duration, although the graph indicates that persons born in Italy may vary from this pattern. In each case, the rates are still lower than for Australian-born persons.

Some care is needed in interpreting changes in these values of standardised mortality ratios. The data are not based on the lifetime experience of individuals, only on successive arrival cohorts. Mortality for persons arriving at different times may reflect the features and experience of different waves of immigrants (Young 1992).

This phenomenon of converging health status has led researchers to focus on ‘acculturation’ as an explanation—a process wherein immigrants adopt the knowledge, attitudes, beliefs and health behaviours of the wider population (Hyman 2001; Singh & Siahpush 2001). Degrees of assimilation and integration may vary, depending on the country of birth, but there is evidence of at least some loss of health advantage for overseas country-of-birth groups with increasing length of stay.



Source: AIHW Mortality Database.

Figure 4.14: Standardised mortality ratios by selected country of birth and length of residence in Australia, persons aged 15 years or over, 2000–2002

4.8 People in rural and remote areas

In recent times there has been a special focus on understanding and improving the health of the 34% of Australians who live in rural and remote areas. This is because, as a broad generalisation, they have somewhat higher mortality rates than those living in urban areas and higher levels of several health risk factors. This raises questions about whether those in rural and remote areas have inadequate access to health services, more occupational or environmental hazards, more adverse social and economic conditions, or some combination of these elements.

Rural and remote populations are those outside cities having populations greater than 250,000 people. They comprise a range of environments: large regional centres, coastal settlements, small inland towns, farms and so-called 'outback' Australia. The common feature of their people is that they live some distance from the major population centres. The following discussion about the health of people living in rural and remote areas uses the geographical terms Major Cities, Inner Regional, Outer Regional, Remote and Very Remote (see Box 4.3).

Statistics on the health of Australians living in rural and remote areas are given in some detail below, but some observations may help to explain the findings. First, compared with people in Major Cities, those living elsewhere are more likely to be smokers; to drink alcohol in hazardous quantities; to be overweight or obese; to be physically inactive (AIHW 2005h); to have lower levels of education; and to have poorer access to work, particularly skilled work (Garnaut et al. 2001). They also have less access to specialist medical services and a range of other health services (AIHW 2005h). In addition, numerous rural occupations (for example, farming, forestry, fishing and mining) are physically risky, and travelling over the often-long distances of country roads can be more dangerous because of factors such as higher speeds, fatigue from longer driving times, and animals on the road (AIHW: Strong et al. 1998). A final feature is that remote areas have substantial Indigenous populations, and Indigenous health is generally poor (ABS & AIHW 2005; AIHW 2005h).

Box 4.3: Classifying the areas where we live

The ABS Australian Standard Geographical Classification (ASGC) Remoteness Areas classification (ABS 2001; AIHW 2004b) allocates one of five remoteness categories to areas depending on their distance from a range of five types of population centre.

Areas are classified as Major Cities, as Inner Regional or Outer Regional (referred to here as 'regional' when taken together), or as Remote and Very Remote ('remote' when taken together). In tables and figures in this section, the categories of Major Cities, Inner and Outer Regional, Remote and Very Remote areas are represented by the abbreviations MC, IR, OR, R and VR, respectively.

The bulk (66%) of the Australian population lives in Major Cities, 31% in regional areas and 3% in remote areas. Indigenous people live mainly in Major Cities (30%) and regional areas (43%), with the remaining 27% living in remote areas. Although Indigenous Australians comprise 2.4% of the total Australian population, they comprise 24% of the population in remote areas, including 45% in Very Remote areas (Table 4.19).

Despite these general patterns, there is considerable variation within each broad geographical area. Remoteness does not guarantee poorer health, just as living in a large population centre does not guarantee the opposite. Populations in some metropolitan fringe and inner-city areas, for example, have relatively poor health (Burnley 1994). Also, in an analysis covering 1993–1999, about half of all statistical local areas (SLAs) in Very Remote areas had lower death rates than the Major Cities average (AIHW 2003d). However, of those SLAs that had higher rates, about half had rates that were at least twice as high as those of Major Cities.

A major problem in understanding the health of people in regional and remote areas is the limited availability, representativeness and quality of data. Very few data sources are complete, accurate, regionally representative and unambiguous enough to allow meaningful comparisons between populations from different areas (AIHW 2003c). This applies particularly to remote areas. Also, because Indigenous Australians make up a substantial proportion of rural and (particularly) remote area populations, 'rural/remote' issues can frequently be related to Indigenous issues. For example, overall rates of cervical cancer death tend to be higher in remote areas, but not in the non-Indigenous people who live there (AIHW 2003b, 2003d). In this case, the extra challenge is therefore one of Indigenous health, not necessarily the health of those living in remote areas as such. However, information that allows distinctions such as this is uncommon because the identification of Indigenous people in data sources can frequently be incomplete (ABS & AIHW 2005).

Another difficulty in interpreting the data is that different patterns of service provision in city, regional and remote areas can lead to invalid comparisons of their resource usage and access to services (AIHW 2003c). For example, rural areas make greater use than cities of hospital emergency departments as a source of primary care services and of hospital beds as a source of aged care services. This factor complicates inter-regional comparisons of hospital usage, aged care and provision of primary health care.

Characteristics of regional and remote area populations

Although the most visually obvious component of the economy in regional and remote areas is agriculture, the majority of people in these areas derive their income from other industry sectors (Table 4.19).

Table 4.19: Selected characteristics of Indigenous and total populations, by remoteness area, 2001

	Major City	Inner Regional	Outer Regional	Remote	Very Remote	Aust
			Per cent			
Total population living in each area	66	21	10	2	1	100
Indigenous population living in each area	30	20	23	9	18	100
Population in each area who are Indigenous	1	2	5	12	45	2
Adults employed in primary production[(a)] and mining	<1	4	11	20	16	3
Adults employed in other industry sectors	58	50	46	45	44	55
Adults not in the workforce or unemployed	41	46	43	35	39	42
People living in areas classified as being in the						
least disadvantaged national SEIFA quartile[(b)] (1996)	34	14	8	10	2	26
most disadvantaged national SEIFA quartile[(b)] (1996)	20	28	33	26	53	24
Youth starting tertiary study[(c)]	39	26	23	12	10	33
Non-Indigenous youth starting tertiary study[(c)]	39	27	24	13	21	34
Reticulated water supplies adequately fluoridated[(d)]	81	39	34	30	20	49
			Average costs (dollars)			
Monthly mortgage	985	813	775	786	605	926
Weekly rent	206	155	154	148	122	189

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

(b) SEIFA (Socioeconomic Indexes for Areas) quartiles relate to the population in each area who lived in Census collectors districts that were among the 25% least disadvantaged, and the 25% most disadvantaged.

(c) Youth commencing tertiary (university and TAFE) study relates to the percentage of those aged 17–20 years from each area that commenced tertiary study in 2001. Limited accuracy of the Indigenous identifier cautions against regional reporting for Indigenous people. Nationally, 10% of Indigenous people of this age commence tertiary study.

(d) Fluoridation data are derived from a rolling survey, and may not relate specifically to 2001.

Sources: AIHW population database; AIHW 2005h.

Levels of income and education are lower in regional and remote areas than in Major Cities. In 2001, over half (55%) of people living in Very Remote areas were classified as being among the most disadvantaged people in Australia, and 2% were among the least disadvantaged (see Section 4.6). This compares poorly with those living in Major Cities, where only one-fifth were among the most disadvantaged and just over a third (34%) were among the least disadvantaged. About 25% and 10%, respectively, of those aged 17–20 years from regional and remote areas commenced university or TAFE in 2001, compared with almost 40% of those from Major Cities.

The profile suggesting more social and economic disadvantage in regional Australia—and in remote areas especially—reflects a number of factors. One important consideration is the greater representation of Indigenous people in regional Australia, with their general situation of disadvantage.

The cost of housing in regional and remote areas tends to be, respectively, 75% and 65% of housing costs in Major Cities, but other costs are higher. For example, the costs of food and petrol increase with increasing remoteness, so that in Very Remote areas they are respectively about 15–20% and 10% more expensive than in Major Cities (AIHW 2005h). About 35% and 25% of reticulated water supplies in regional and remote areas, respectively, were considered to be adequately fluoridated compared with 80% in Major Cities (Table 4.19).

Health status

On a wide range of health status measures, people who live in regional and remote areas generally do worse than people who live in Major Cities (Table 4.20).

Higher death rates and poorer health outcomes in regional and remote areas are likely to be the result of factors such as higher levels of socioeconomic disadvantage (lower incomes and lower levels of education), poorer access to health services, higher levels of personal health risk factors such as smoking, and environmental issues associated with road travel and occupation. The relatively large proportion of Indigenous people in Remote and Very Remote areas (12% and 45% respectively) compared with Major Cities, coupled with their poor overall health, is reflected in high rates of death in remote areas.

It is believed that older people in remote areas tend to move to less remote areas so as to access services, particularly after the onset of ill health. This would leave a more healthy group of older people that remain in remote areas and this may help to explain their apparent relatively low rates of death (Table 4.20), an effect that complicates inter-regional comparisons of mortality.

In 1998, people younger than 65 years and living in regional areas were up to 1.6 times as likely to have a profound/severe disability as those in Major Cities (AIHW 2005h). They were also more likely to be diagnosed with a communicable disease; for example, in 2001, people from Remote and Very Remote areas were 1.9 and 8.7 times as likely to be diagnosed with, respectively, pertussis and Ross River virus infection.

Children living in regional and remote areas in 1998 had more decayed, missing and filled teeth than their Major Cities counterparts; and this probably reflects a number of issues, including the lower availability of adequately fluoridated water outside Major Cities (AIHW 2005h).

Table 4.20: Selected health indicators, by remoteness area

	Major City	Inner Regional	Outer Regional	Remote	Very Remote
			Standardised ratio		
Males <65 years with profound/severe activity restriction (1998)[(a)]	1.00	1.57	1.46	n.a.	n.a.
Females <65 years with profound/severe activity restriction (1998)[(a)]	1.00	1.27	1.03	n.a.	n.a.
Pertussis notifications (2001)	1.00	*1.31	*1.88	*1.90[(b)]	*1.90[(b)]
Ross River virus notifications (2001)	1.00	*3.15	*4.85	*8.71[(b)]	*8.71[(b)]
Perinatal deaths (1999–2001)	1.00	*1.13	*1.28	*1.43	*2.42
Deaths (all ages, 1997–1999)	1.00	*1.06	*1.10	*1.13	*1.50
Deaths, non-Indigenous (all ages, 1997–1999)	1.00	*1.05	*1.08	*1.03	0.95
Death >74 years, non-Indigenous (1997–1999)	1.00	*1.03	*1.04	*0.93	0.71
Death <65 years, non-Indigenous (1997–1999)	1.00	*1.11	*1.15	*1.13	*1.21
			Number		
Average DMFT teeth in 6 year olds (1998)[(a)(c)]	1.45	1.93	1.87	1.71	1.88
Average DMFT teeth in 12 year olds (1998)[(a)(c)]	0.84	0.98	0.85	1.02	1.09

(a) Statistical significance is not available for these results.

(b) These ratios are not specific to Remote or Very Remote areas, but are averages for remote areas generally.

(c) Decayed, missing and filled permanent teeth. See Chapter 2.

Notes

1. Reported standardised ratios are indirectly age-standardised using Major Cities age-specific rates. The ratios are a way of comparing the levels of health in various areas with that in a reference area, in this case Major Cities. A ratio of 1.5 for mortality, for example, indicates that there were 1.5 times as many deaths as expected had the age-specific rates for Major Cities been applied to the population in that area.
2. Ratios that are statistically different to 1.00 are marked with an asterisk (except for activity restriction and DMFT teeth, for which information on statistical significance was not available).

Sources: AIHW 2003d, 2005i.

Mortality

Although they do not express the full range of health experiences, measures of mortality are arguably the most robust way of comparing the health of people living in the various areas.

Compared with those in Major Cities, perinatal death rates were higher in regional areas and especially in remote areas. This is at least partly a reflection of the Indigenous population distribution and the overall high Indigenous perinatal mortality (Table 4.20).

Considering death rates for people across all ages, those in regional, Remote and Very Remote areas were respectively about 1.1, 1.1 and 1.5 times as high in 1997–99 as those in Major Cities (AIHW 2003d). This corresponds to about 3,300 additional deaths annually, over and above what would be expected if regional and remote age-specific death rates were the same as in Major Cities. These extra deaths were due to coronary heart disease (23% of the ‘excess’ deaths); other circulatory diseases (16% of the excess); chronic obstructive pulmonary disease (11%); motor vehicle accidents (11%); diabetes

(6%); suicide (6%); other injuries (6%); and prostate, colorectal and lung cancers (together about 10%).

It is not possible to compare Indigenous death rates across areas because of uncertainty about the accuracy of Indigenous identification in each area (AIHW 2003d). However, it is clear that the mortality of Indigenous people overall is much higher than that for non-Indigenous people irrespective of where the latter live.

Death rates for non-Indigenous people in regional and remote areas were, respectively, a little higher than or similar to those in Major Cities (Table 4.20). The moderate overall death rates in remote areas are strongly influenced by the lower death rates for older people living there (discussed earlier). Death rates of younger non-Indigenous people from regional and remote areas were respectively about 1.1 and 1.2 times as high as those in Major Cities.

Improvements in death rates

Between 1992 and 2003, all-cause death rates declined in all five Remoteness areas: by about 3% per year for males and correspondingly by about 2% per year for females (AIHW 2006). The absolute decline in death rates was greater for both sexes in Very Remote areas than in the other areas (from a substantially higher death rate at the beginning of the period), but the absolute decline was slightly less for males in Inner Regional areas.

These improvements have been driven mainly by reductions in circulatory disease and cancer death rates. These two areas of gain have been respectively responsible for about 72% and 17% of the decline in Major Cities, about 80% and 11% in regional areas and about 60% and 20% in remote areas.

Apart from the improvements in circulatory disease and cancer death rates, declines in mortality due to respiratory disease, injury and other causes contributed little in most areas, although respiratory disease contributed 22% of the mortality decline in Very Remote areas (AIHW 2006).

For specific causes of death, mortality tended to decline over time, frequently with faster rates of decline in Very Remote areas (where death rates have tended to be higher). However, for some causes and in some areas, rates have increased over time. For example, whereas suicide death rates declined overall for Australian males between 1992 and 2003, they increased in remote areas. Suicide death rates also increased over the period for females in Inner Regional areas (AIHW 2006).

Access to services

People living in regional and remote areas tend to have lower levels of access to health services (AIHW: Strong et al. 1998). Despite this, immunisation rates for children under 2 years in 2002 appeared similar to, or only slightly lower than, those in Major Cities; and rates of breast cancer and cervical screening in 2001 appeared higher than in Major Cities (AIHW 2005h).

There were more hospital beds per person in regional and remote areas in 2002–03 (respectively, 3 beds and 5 beds per 1,000 residents) than in Major Cities (2.5 beds). Compared with Major Cities, hospitals in regional and remote areas were less likely to be accredited under a national accreditation scheme, and tended to be a lot smaller. Many hospitals outside Major Cities had fewer than 30 beds, but about 30 had between 100 and 300 beds (AIHW 2005h).

There were differences in the rate at which people from Major Cities, regional and remote areas were admitted to hospital for a range of surgical procedures in 2002–03. Notably, the rate of admission for coronary artery bypass graft surgery and coronary angioplasty was lower for residents of regional and especially remote areas than for those in Major Cities. This contrasts with the higher death rates due to coronary heart disease in these areas. Rates of surgical procedure are likely to be affected by issues such as need and access, both physical and financial.

The supply of health workers typically declines with remoteness (Table 4.21).

Table 4.21: Supply of health workers by remoteness area, 2001–2002 (per 100,000 population)

Occupation	Major Cities	Inner Regional	Outer Regional	Remote	Very Remote
General practitioners	118	92	85	76	81
Specialists	108	48	30	16	7
Registered nurses	886	836	753	731	756
Enrolled nurses	172	273	303	303	200
Pharmacists	82	63	52	37	28
Physiotherapists	62	37	32	38	14
Podiatrists	11	9	4	4	2

Note: General practitioners include all primary care medical practitioners.

Source: AIHW Labour Force Surveys.

However, health workers in regional and especially remote areas tend to work longer hours than those in Major Cities. For example, in 2001, the weekly hours worked by GPs in regional, Remote and Very Remote areas were 10%, 15% and 26% more than those in Major Cities (AIHW 2005h). This tends to partly compensate for the shortfall in the numbers of health workers in these areas. On the other hand, longer working hours in these areas could impose additional strain on these workers, with resultant difficulties retaining staff in the longer term.

4.9 Veterans

Veterans and their dependants—the ex-service community—represent a considerable proportion of Australia's older population. They comprise 9% of persons aged 65 years or over, rising to 21% of persons aged 85 years or over. They have many health features in common with other persons of their age, but also have some particular health needs. Because of the special access to services they are provided with, there is the opportunity to examine the health of this older group in more detail than is available for other Australians.

This section summarises health information on the servicemen and females who enlisted in the Australian Forces over the past century. At June 2005, an estimated 261,200 of the 1.6 million of these veterans were still alive. They served in conflicts from

World War I (1914–1918) and World War II (1939–1945), through to recent overseas missions (Table 4.22).

Table 4.22: Veterans enlisted or engaged, and estimated survivors at 30 June 2005

	Number enlisted or engaged	Estimated survivors
World War I	416,809	2
World War II	1,118,000	170,400
Other pre-1972 conflicts	86,480	65,600
Post-1972 conflicts	n.a.	25,200
Total survivors	. .	**261,200**

Source: Department of Veterans' Affairs.

Health entitlements of the veteran population

Recognising the special contribution made to the nation by veterans, the Australian repatriation system provides a wide range of benefits to the ex-service community. Under the *Veterans' Entitlements Act 1986*, the Department of Veterans' Affairs (DVA) provides eligible members of the veteran community with access to health care, assistance in the home and support services through arrangements with registered health care practitioners, home support agencies and providers, and public and private hospitals.

Eligible veterans, war widows or widowers and dependants are issued with entitlement cards that reflect their level of health care coverage (Box 4.2).

Box 4.2: DVA entitlement cards

Holders of a gold card (the Repatriation Health Card – For All Conditions) are entitled to the full range of health care services at DVA expense, including medical, dental and optical care.

Holders of a white card (the Repatriation Health Card – For Specific Conditions) 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.

An orange card (Repatriation Pharmaceutical Benefits Card) was introduced on 1 January 2002 and provides pharmaceutical benefits under the Repatriation Pharmaceutical Benefits Scheme to British Commonwealth and Allied veterans who have World War II qualifying service, are aged 70 years or over and have lived in Australia for 10 years or more.

Veterans aged 80 years or over, largely from World War II and the Korean conflict, represent the greatest proportion of gold and white card holders (53%). Those aged under 55 are the next largest group, comprising around 13% of veterans.

Table 4.23 shows the DVA health treatment population in various age groups entitled to care, including veterans, dependent spouses and children, but excluding persons who only hold an orange card.

Table 4.23: DVA health treatment population at 30 June 2005

	Age group									
	<55	55–59	60–64	65–69	70–74	75–79	80–84	85+	Unknown	All ages
Veterans										
Males	23,725	22,928	10,918	6,550	6,810	18,920	62,686	33,882	18	186,437
Females	2,198	95	74	32	49	796	4,895	2,056	4	10,199
Dependants										
Males	350	27	13	15	16	14	31	8	0	474
Females	1,632	1,421	1,835	3,295	8,835	28,308	37,836	28,415	17	111,594
Others[(a)]	202	247	357	680	865	1,258	2,451	1,552	17	7,629
Total	**28,107**	**24,718**	**13,197**	**10,572**	**16,575**	**49,296**	**107,899**	**65,913**	**56**	**316,333**

(a) British, New Zealand, overseas and Commonwealth countries' forces and miscellaneous.

Note: The DVA health treatment population only includes gold and white card holders. There are 17,874 orange card holders, of whom 2,958 also hold a white card, and these white card holders are included above.

Source: Department of Veterans' Affairs.

Mortality among veterans

An analysis of deaths in 2004 and 2005 in the veteran's treatment population—restricted to those veterans who have access to paid health treatment—showed that their death rates differed substantially from the rest of the community. Male gold card holders (that is, those who are entitled to all health services) had a death rate around 13% higher than the general Australian rate for their age group (Table 4.24), and male white card holders (that is, those who have specific disabilities only) similarly had rates around 17% higher. In contrast, female gold card holders had death rates 5% lower than that of the general community. Death rates also differed substantially between disability pension levels. Veterans receiving an Extreme Disability Allowance, for example, have a death rate 2–3 times that of the general community.

Table 4.24: Standardised mortality ratios among the veteran population, 2004-2005

	Observed deaths	Expected deaths[(a)]	Standardised mortality ratio
Male gold card holders	22,936	20,228	1.13
Male white card holders[(b)]	3,246	2,768	1.17
Female gold card holders	13,338	14,042	0.95

(a) Expected deaths are the number of deaths calculated had veterans experienced the death rates of the general Australian population.

(b) Following the extension of eligibility for the gold card in 1998, there has been a substantial shift from white card holders to gold card, affecting the composition of male white card holders and hence their mortality patterns.

Source: Department of Veterans' Affairs.

Another recent study commissioned by DVA examining gold card holders also found higher rates of death, although the comparison was made to the rest of the Australian population, not the total population (Access Economics 2005).

Quality of life of veterans

Another recent study examining mental, physical and social quality-of-life scores for veteran and war widow(er) gold card holders suggests that mental health and, to a lesser extent, physical health have a strong impact on veterans' overall quality of life. The relative importance of each of these three dimensions was found to differ according to age, sex and service history (CMVH 2005).

Younger respondents (aged under 65 years) had better physical health, similar social activity, but poorer mental health than older respondents. Males had significantly worse mental health scores than females, but physical or social health scores did not vary significantly according to gender. Those veterans who had served in conflicts and operations after 1955 had worse mental health scores, slightly better physical health scores and similar social quality-of-life scores than did the pre-1955 group.

When analysing the relationship between health expenditure and the three dimensions of quality of life, there was found to be substantially more expenditure on treatment services and pharmaceuticals among respondents with poorer levels of physical and mental health—better health scores were associated with lower costs.

Mental health and the veteran community

It is estimated that about 154,000 persons in the DVA treatment population (nearly one in two) have some mental health concerns, and 56,000 of these have had a mental health disability confirmed by DVA. Among this larger group, 101,000 are veterans while the remaining 53,000 are mostly war widows and widowers. About 37% are female, reflecting both the increasing number of females in the Australian Defence Force and the increasing proportion of war widows within the veteran community. Three-quarters are aged 70 years or over, with the largest group aged 80–89 years. This reflects the higher number of older veterans involved in World War II and surviving war widows and widowers of that conflict. The next most significant category is the 70–79 year age group, followed by those aged 50–59 years. The 50–59 year age group mainly reflects the number of veterans involved in the Vietnam conflict (Table 4.25).

Table 4.25: DVA mental health clients at 30 June 2005

	Age group									
	<50	50–59	60–69	70–79	80–89	90+	Unknown	Males	Females	All
Number	4,835	21,073	14,129	27,029	78,258	8,468	125	97,514	56,403	153,917
Per cent	3.1	13.7	9.2	17.6	50.8	5.5	0.1	63.4	36.6	100.0

Source: Department of Veterans' Affairs.

Post-traumatic stress disorder, anxiety disorder, alcohol dependence and depressive disorder are the most common mental health conditions, with approximately two-thirds of the DVA treatment population with mental health concerns receiving some form of mental health treatment or pharmacological intervention (Hawthorne et al. 2004). One in five has more than one mental health condition.

Health study of Korean War veterans

A study into the health of 7,525 surviving male Korean War veterans showed that they are experiencing significantly more psychological ill health, lower life satisfaction and poorer quality of life than other Australians, along with excess medical conditions and hospitalisations (Sim et al. 2005). The study was designed to complement the recently completed studies of Australian Korean War veterans' mortality (Harrex et al. 2003) and cancer incidence (AIHW 2003a). These studies showed that participation in the Korean War is associated with an overall mortality rate 21% greater than that of the equivalent Australian male population, a 31% greater rate of cancer mortality, and an incidence of all cancers between 13% and 23% higher than expected. Together, the studies demonstrated that the long-term effects of war service can be severe, and can still be present 50 years after the end of hostilities.

4.10 Prisoners

Prisoners are a substantial population group, characterised by social and psychological disadvantage. They face major health issues, including high rates of communicable diseases, mental illness, and health risk behaviours such as injecting drug use.

On 30 June 2005, there were 25,353 adults imprisoned in Australia, about 1 in 600 adults (ABS 2005d). The prisoner population grew by 4.9% during 2004–05, greatly exceeding the 1.2% growth rate of the general population over the same period. Since 1995, the prisoner population has grown by 45%. The rate of incarceration in 2005 was 163 persons per 100,000 adult population, with New South Wales having the greatest number of prisoners of all the states (9,819, 39% of the total) and the Northern Territory the highest rate of imprisonment (over 1 in 200 adults). Indigenous persons are markedly over-represented—22% of Australian prisoners are Indigenous—and imprisoned at a rate of 2,021 per 100,000 adult population, compared with 125 per 100,000 adult population among non-Indigenous persons.

Prisons contain a largely male population (93%), the bulk of whom come from disadvantaged backgrounds (Butler & Milner 2003). Compared with the general population, prisoners include more people with, variously, low levels of educational attainment, high unemployment and welfare dependency, mental illness and drug dependency (Butler et al. 2005). With disadvantage come poor health and a range of special health needs. Since most prisoners will return to the community, it is important that their health needs are addressed while they are in prison, and that their health does not deteriorate during incarceration.

Health status

National data on the health status of Australian prisoners are not available, with studies to date focusing on a selected number of prisons within a particular state or territory. These studies have found prisoner populations to be at high risk for a range of health problems, including bloodborne communicable diseases, sexually transmissible infections, traumatic brain injury, and mental health problems. Some of these health problems, such as viral hepatitis and HIV infection, can be attributed to lifestyle factors, including injecting drug use and sexual activity.

In May 2004, the first multi-state prison study into the prevalence of bloodborne viruses was conducted (Butler, Boonwaat & Hailstone 2005). Over a two-week period, all male and female prisoners entering correctional centres from the community in New South Wales, Queensland, Tasmania and Western Australia were screened for HIV, hepatitis B and hepatitis C. Risk behaviours, including drug use and sexual activity, were also recorded.

The overall prevalence of hepatitis C was 35%, rising to 56% among prison entrants reporting current or previous injecting drug use (Table 4.26). This figure compares dramatically with an estimate of 1.3% of the general community having been exposed to the hepatitis C virus (NCHECR 2005). Hepatitis B core antibody prevalence was 20% among prison entrants, with testing revealing 25% of entrants having immunity against hepatitis B due to vaccination. The prevalence of HIV antibody (less than 1%) was low but still higher than that found in the general community, which was 0.07% in 2004.

Table 4.26: Serology results and injecting drug history, by state, 2004 (per cent)

	New South Wales	Queensland	Tasmania	Western Australia	Total
Hepatitis C antibody prevalence					
Injectors	69	49	67	33	56
All prison entrants	43	30	48	20	35
Hepatitis B core antibody prevalence					
Injectors	31	16	42	27	27
All prison entrants	23	13	29	18	20
HIV antibody prevalence	2	1	0	0	1
Injecting drug use					
History of injecting drug use	59	58	63	58	59
Has injected in last month	41	36	32	36	38

Source: Butler, Boonwaat & Hailstone 2005.

The risk of exposure to bloodborne viruses is much increased among those who inject drugs; almost 60% of prison entrants had a history of drug injection, with 38% reporting having injected in the last month. The most common drugs injected include amphetamines and heroin. Among the general community in 2004, an estimated 1.9% had ever injected drugs, with 0.4% injecting in the previous 12 months (AIHW 2005b).

Over two-thirds (69%) of injecting drug users reported using new needles and syringes for all injections in the month before incarceration. The study highlights the value of conducting bloodborne virus surveillance in prisons.

The very high rate of mental health problems among prisoners continues to merit considerable attention. In 2001, a study in New South Wales found that a substantial number of prisoners, either at the point of reception or currently serving a prison sentence, were suffering from a mental disorder (Butler et al. 2005). Overall, 78% of males and 90% of females assessed at reception had at least one mental illness diagnosis, including either psychosis, affective disorder, anxiety disorder, substance use disorder, personality disorder or combinations of these (Table 4.27). Among those who were already serving a prison sentence, the corresponding figures were 61% for males and 79% for females.

Depression was the most common affective (mood) disorder in both the reception and sentenced groups, while post-traumatic stress disorder was the most common anxiety disorder. One in 20 prisoners reported that they had attempted suicide in the 12 months before interview. In both males and females, the prevalence of having any psychiatric disorder declined with age. The highest prevalence across both sexes was in females under 25 years old, and the lowest was for males over 40 years of age.

Table 4.27: Twelve-month prevalence estimates of major mental disorders among reception and sentenced prisoners in New South Wales, 2001 (per cent)

	Reception prisoners		Sentenced prisoners	
Diagnosis	**Males**	**Females**	**Males**	**Females**
Psychosis	11	15	4	6
Affective disorder				
Depression[(a)]	16	24	10	14
Dysthymia	7	10	4	6
Manic episode[(b)]	3	8	1	2
Any affective disorder	*21*	*34*	*12*	*20*
Anxiety disorder				
Post-traumatic stress disorder	22	44	16	44
Generalised anxiety disorder	13	22	12	15
Panic disorder	7	17	7	16
Other anxiety disorders[(c)]	7	6	5	9
Any anxiety disorder	*34*	*56*	*28*	*54*
Any mental disorder (above)	42	62	33	59
Any substance use disorder	64	75	34	57
Any personality disorder	40	57	37	38
Any psychiatric disorder (above)	78	90	61	79

(a) Includes mild, moderate and severe depression.

(b) Includes mania, hypomania, and bipolar affective disorder.

(c) Includes agoraphobia, obsessive-compulsive disorder and social phobia.

Source: Butler et al. 2005.

The prevalence of psychiatric disorder was significantly higher among prisoners than in the general community (Butler et al. 2006). In the ABS National Survey of Mental Health and Wellbeing, the general 12-month prevalence for any psychiatric disorder was 22% (compared with 77% among all inmates in the New South Wales study), for any mental disorder 18% (42% among the NSW inmates), for psychosis 0.4% (9%), for affective disorder 6% (22%), for anxiety disorder 10% (43%), for substance use disorder 8% (57%) and for personality disorder 7% (43%) (ABS 1998).

Mortality

Information is available on deaths in prisons and their causes. In 2004, 39 deaths occurred in prisons across Australia, the same number as in 2003, and down from 57 deaths in 2001. The prison custody crude death rate was 1.6 male and 1.2 female deaths per 1,000 prisoners. Most deaths occurred among younger persons—the average age of death in 2004 was 37 years. Natural causes of death predominated (19), followed by hanging (14, often through the use of bedding materials or blankets) and other causes (6). Most deaths occurred either in prison cells or public hospitals (17 each), followed by prison hospitals (5) (Joudo & Veld 2005).

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5 Focus on child health

The 2004 edition of *Australia's health* contained a special chapter that focused on an issue of growing interest, the health of older Australians. In 2006, the special topic is one of equal importance for Australia and its future—children and their health.

In many respects, children living in Australia today are healthier than previous generations. As for other ages, death rates for both infants (aged under one year) and children (aged 1–14 years) have fallen markedly over past decades and continue to fall. There have been large reductions in deaths and illness from specific conditions, including communicable diseases and injuries. General improvements in the health of mothers and in medical care during pregnancy and birth have also led to substantial gains in the health of Australian children, particularly as measured by lower death rates.

However, there are a number of areas of concern that can affect the health of children both during childhood and later in their life. One concern is the great increase in the proportion of children who are overweight and obese. Related to this but also having independent health impacts are reductions in numerous aspects of physical activity and increases in energy intake. Significant illnesses that are becoming more common or affect a large number of children include diabetes, asthma and mental health problems.

These and other health issues are examined in this focus chapter on child health. Children are defined here as boys and girls under the age of 15 years. In this evaluation of the health of Australia's children, particular emphasis has been placed on comparisons of health status and determinants of health over time, comparisons between population groups, and comparisons with other member countries of the Organisation for Economic Co-operation and Development (OECD) where possible.

Children are a priority

Childhood, particularly early childhood, has become a key priority for governments and non-government organisations across Australia. This is in response to emerging issues of concern about Australia's children in the context of rapid social change. This change has brought so-called 'new morbidities' such as rising obesity, and behavioural, developmental, mental health and social problems. A range of biological, family and social factors has been shown to be important for children's physical and psychological health, their behaviour and their educational achievements (Patton et al. 2005; Prior et al. 2000; Zubrick et al. 2000).

There is also evidence about the importance of the early years for laying the foundations for children's later health and wellbeing, and about the types of early interventions that can capitalise on this. This has prompted the government decision to work towards a National Agenda for Early Childhood, a collaborative effort by all levels of governments to coordinate efforts to achieve the best outcomes for children (ACCAP 2004).

Central to the National Agenda is the capacity to regularly monitor how Australia's children are faring generally, and how certain population groups are faring, such as Indigenous children and children from rural Australia (ACCAP 2004). As part of this process, several states and territories have commissioned reports monitoring the progress of children within their jurisdictions (Centre for Epidemiology and Research 2002; NSW and Queensland Commissions for Children and Young People 2004; Tennant et al. 2003). In 2005, the Australian Institute of Health and Welfare produced a report, *A picture of Australia's children*, bringing together national data on a range of factors that the National Agenda recognised as affecting children's outcomes (see AIHW 2005a).

How many children are there in Australia?

In June 2004, there were approximately 4 million children aged under 15 years in Australia (20% of the total population) (ABS 2004a). As a proportion of the total population, the child population has been declining due to changing fertility patterns and increased life expectancy. It peaked at 30% in 1961 but fell to 20% in 2004, a figure well below a previous low point of 24% in 1943.

In 2003, 64% of children lived in major cities, 22% in inner regional areas and 11% in outer regional areas. Children living in remote or very remote areas accounted for about 3% of the child population. This is very similar to the distribution for the total population.

In 2001 there were 179,000 Indigenous children, making up 4.5% of all children (ABS 2003a). The Indigenous population has a much younger age structure than that of other Australians. In 2001, 39% of this population were children, compared with 20% of other Australians. This reflects both the higher birth rate and higher levels of mortality at younger ages among the Indigenous population (ABS & AIHW 2005).

The proportion of children born overseas was 6% in 2003 (ABS 2004b). Children born in Australia to overseas-born parents are not included in this figure. Of the 227,000 overseas-born children in the Australian population in 2003, the largest groups were those born in New Zealand (19%) and England (11%). Of those born in countries where English is not the main language, the largest groups were from the Philippines and India (4% each), China (3%), and South Korea, Indonesia, Iraq, Sri Lanka, Singapore, Malaysia and Vietnam (2% each).

The families they live in

With the changing social attitudes towards marriage and fertility choices, Australian families have changed in the last 30 years (ABS 2003b). The result has been an increasing diversity of family types in which Australian children are raised.

Although the dominant type of family in Australia is still the couple family, lone-parent families are becoming increasingly common (AIHW 2003a). According to 2001 Census counts, 47% of all Australian families were couple families with children, compared with 50.2% in 1971, and lone-parent families represented 15.4% of all families, a significant increase from 5.7% in 1971 (ABS 2003c).

In 2003, most Australian children (72%) aged 0–14 years lived in intact families; that is, a family consisting of both natural parents of the child. By contrast, nearly 20% lived in lone-parent families. Of the children living in lone-parent families, 88% lived with lone mothers (Table 5.1).

Data from the 2001 Australian Bureau of Statistics' (ABS) Census of Population and Housing showed that in households with Indigenous people, the proportion of children living in one-parent families (44%) was over double the 20% in other households, and also the proportion of children living in multi-family or group households (6%) was higher than in other households (2%) (ABS 2003a).

Table 5.1: The family structure of Australian children aged 0–14 years, 2003

Family structure	Number ('000)	Per cent
Couple families		
Intact families[(a)]	2,805.9	72.1
Step-families[(a)]	118.4	3.0
Blended families[(a)]	197.5	5.1
Other couple families	16.0	0.4
Lone parent families		
Lone mother	663.1	17.0
Lone father	88.6	2.3
Total children in all families[(a)]	**3,889.5**	**100.0**

(a) Includes a small number of children without a natural parent living in the household (for example, foster children or other related children).

Source: ABS 2004c.

Summarising progress

National indicators of children's health, development and wellbeing have been developed and described in *Key national indicators of children's health, development and wellbeing* (AIHW 2004a). Table 5.2 summarises the trends over time for the health subset.

Table 5.2: Summary of progress: child health indicators

Broad indicator	Changing for better	No change	Unfavourable trend	No comparable trend data
Infant mortality rate	✓			
Mortality rate among children aged 1–14 years	✓			
Infant deaths from SIDS	✓			
Death rate from all types of injury	✓			
Hospitalisations from all types of injury		✓		
Prevalence of asthma		✓		
Incidence of Type 1 diabetes			✓	
Incidence of cancer		✓		
Five-year survival rate for leukaemia		✓		
Mental health of children				✓
Dental health of children	✓			
Children with severe/profound activity restriction				✓
Exclusive breastfeeding of infants				✓
Proportion of low birthweight babies		✓		
Proportion of children overweight or obese			✓	
Women smoking during pregnancy				✓
Children exposed to household tobacco smoking	✓			
Tobacco use among children	✓			
Alcohol misuse among children				✓
Infants & children fully vaccinated at ages 1, 2 & 6		✓		

Source: Adapted from AIHW 2005a.

5.1 Health status

Chapter 2 of this report outlines the health status of the whole population. This section covers similar material in more detail for children under the age of 15 years. The main sections are overall measures of health, illness, disability, and deaths.

Parent assessment of children's health

There is no single overall health measure available for children aged 0–14 years. *Growing up in Australia: the longitudinal study of Australian children* (AIFS 2005) provides parent-reported information on health status for children aged 4–5 years. Data from Wave 1 of the survey indicated that the vast majority of this age group were in good to excellent health, according to their parents. Over half (56%) of these children were in excellent health (54% boys and 59% girls). A further 40% were reported to be in good to very good overall health and less than 3% were said to be in fair or poor health.

Illness

While information is limited on the overall health of children in Australia, more is available on the illnesses they have. This section presents information on illness in children from parent reports, and from diagnosis data for hospitalisations and visits to general practitioners (GPs). In addition, there are also boxes included in this chapter with more detail on four specific conditions: mental health problems (Box 5.1), diabetes (Box 5.2), asthma (Box 5.3) and injury (Box 5.4).

Box 5.1: Mental health problems are relatively common among children

Mental health problems, mental disorders and emotional and behavioural problems are terms commonly used to describe changes in thinking, mood or behaviour that are associated with distress or impaired functioning. Although the data sources on mental health problems are limited, the problems appear to be common among Australian children.

Limited data on children's mental health problems were collected in the 2004–05 ABS National Health Survey. From parents' reports, nearly 7% of Australia's children aged 0–14 years had long-term mental or behavioural problems (ABS 2006).

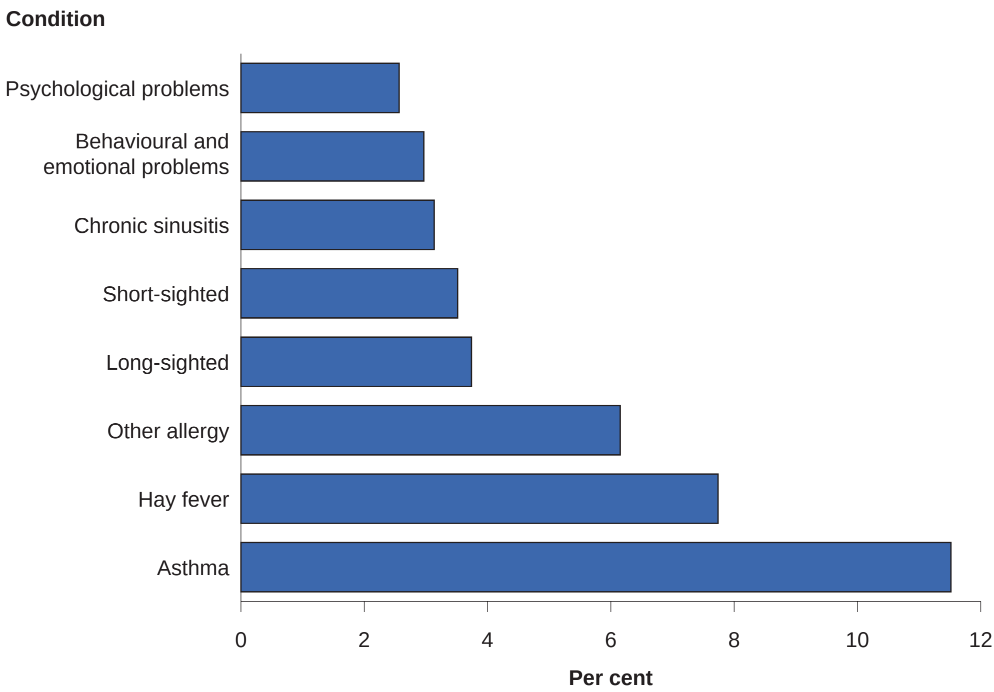
The only detailed study to assess the mental health of children at a population level is the National Survey of Mental Health and Wellbeing, which included a child component conducted in 1998. Although these data are now somewhat out of date, they are the best available national data to describe the level of mental illness among Australia's children.

The survey indicated that about 14% of Australian children aged 4–14 years had mental health problems: 15% of boys and 14% of girls (Sawyer et al. 2000). Of the specific disorders examined in the survey, attention deficit hyperactivity disorder (ADHD) was the most prevalent among children aged 6–14 years, reported for 13% of this age group. However, Sawyer and others (2000:20) suggest that the prevalence may have been overestimated, as some children reported to have ADHD 'may have been more appropriately diagnosed with another disorder not included in the survey'.

The Western Australian Aboriginal Child Health Survey indicates that Aboriginal children have higher rates of clinically significant emotional or behavioural difficulties: 24% compared to 15% of all children in Western Australia aged 4–17 years (Zubrick et al. 2005).

How many children have a long-term illness?

By most measures, the majority of Australian children do not suffer from serious illness. The 2004–05 National Health Survey indicates that around 41% of Australian children suffered from a long-term condition, though this included conditions such as vision problems that would not be considered serious. By comparison, around 86% of people aged 15 years or over reported that they had a long-term condition. The illnesses in children most frequently reported by their parents were allergy-related: asthma, hay fever, and other allergies (Figure 5.1). Chronic sinusitis was also common, as were vision disorders. The mental health conditions of behavioural and emotional problems, and psychological problems were the next most common.



Source: ABS 2006.

Figure 5.1: Most frequently reported long-term conditions for children aged under 15 years, 2004–05

What are children admitted to hospital for?

Although affected by access and admission practices, hospitalisation rates can be used to help indicate the level of serious illness in the Australian community. In the year 2003–04 there were almost 545,000 hospitalisations among children aged under 15 years, a rate of 14 per 100 children. This rate is low compared to other age groups, but the subset aged under one year have a hospitalisation rate higher than all 5-year age groups up to those aged 60–64 years (AIHW 2005b).

The main reasons for admission are shown for the three 5-year age groups in Table 5.3 (at the 'three-digit' diagnosis level). In the youngest of these age groups, perinatal conditions (short gestation and low birthweight) dominated. Respiratory conditions, including acute bronchiolitis and asthma, were also frequent reasons for hospitalisation in children under 10 years of age. Ear, nose and throat conditions were common in all age groups: middle ear infections in the youngest and middle groups, and chronic disease of tonsils and adenoids in the middle and oldest groups. Injuries were also important, with fractures of the forearm being in the top five for both the middle and oldest age groups.

Table 5.3: Top five principal diagnoses for children discharged from hospital, 2003–04

ICD-10-AM 3-digit level	Per cent of hospitalisations for age group
0–4 age group	
Disorders related to short gestation and low birth weight, nec	5.6
Acute bronchiolitis	4.3
Nonsuppurative otitis media	3.4
Asthma	3.3
Diarrhoea and gastroenteritis of presumed infectious origin	3.0
5–9 age group	
Chronic diseases of tonsils and adenoids	7.2
Dental caries	6.7
Fracture of forearm	5.5
Nonsuppurative otitis media	5.1
Asthma	3.4
10–14 age group	
Fracture of forearm	6.2
Chronic diseases of tonsils and adenoids	3.5
Embedded and impacted teeth	3.3
Abdominal and pelvic pain	3.2
Acute appendicitis	3.0

Source: AIHW National Hospital Morbidity Database.

For those aged 0–4 years, the five most frequent principal diagnoses accounted for almost 20% of their 317,000 hospitalisations. For those aged 5–9 years, the top five diagnoses accounted for 28% of the 121,000 hospitalisations, while for those aged 10–14 years they represented 19% of the 107,000 hospital episodes.

What problems do children see GPs about?

Children are frequent visitors to GPs, accounting for 12% of all visits in 2004–05 (Britt et al. 2005). The majority of these are for short-term conditions that children recover from, or for preventive reasons such as vaccinations.

During the period April 2004 to March 2005, 30% of the broad groupings of problems managed by GPs in children were respiratory conditions. Another 20% were in the 'general and unspecified' group, which includes check-ups and vaccinations. A further 15% were for skin disorders, 10% for ear problems, and 8% for digestive problems.

Of the specific problems managed by GPs, the most commonly managed problem was acute upper respiratory tract infections, which accounted for 13% of all problems managed in children (Table 5.4). The second most frequent was preventive; that is, vaccinations and preventive medications (11%). The next four on the list are all respiratory conditions, many of which would be acute conditions. Asthma, a chronic condition with acute episodes, represented 4% of all problems managed in children.

Table 5.4: Most frequent problems managed by general practitioners in children, April 2004 – March 2005

Problem label	Per cent of total problems managed
Upper respiratory tract infection	13.3
Immunisation/vaccination—all	11.0
Acute otitis media/myringitis	6.2
Asthma	4.1
Tonsillitis	3.1
Acute bronchitis/bronchiolitis	3.1
Viral disease, other (not otherwise specified)	2.9
Contact dermatitis	2.7
General check-up[a]	2.0
Infectious conjunctivitis	2.0

(a) Indicates multiple International Classification of Primary Care, 2nd edition rubrics.

Source: BEACH (Bettering the Evaluation and Care of Health) survey.

Disability

Disability is any or all of an impairment of body structures and function, activity limitations or participation restrictions, in the presence of a health condition (WHO 2001). The degree to which a person with a disability is able to participate in society is influenced by a range of environmental factors. Further information on this concept is provided in Chapter 2.

The ABS 2003 Survey of Disability, Ageing and Carers defined 'disability' as the presence of one or more of 17 limitations, restrictions or impairments which had lasted, or was likely to last, for at least six months and which restricts everyday activities (for example, loss of sight, incomplete use of arms or fingers, or difficulty learning or understanding) (ABS 2004d). An indication of the severity of a disability can be obtained using the four different levels of core activity limitations (limitations on the ability to perform self-care, mobility and communication tasks). The two most severe of the four levels are profound and severe core activity limitations.

How many children have a disability and what caused it?

According to the 2003 survey, about 8% of children had a disability, which equates to 317,900 children. Around half of them had a severe or profound core activity limitation. Boys had higher disability rates than girls, and the rates increased with age (AIHW 2005c).

Among all children with a disability, the largest group of 'main disabling conditions' was 'physical/diverse' conditions, with an estimated 122,000 children—or 3.2% of all children—falling into this group (Table 5.5). The next largest group was intellectual conditions (2.2% of all children), followed by sensory/speech conditions (1.6%) and psychiatric conditions (1.2%). A very small percentage of children had an acquired brain injury as their main disabling condition.

Table 5.5: Main disabling conditions for children with a disability, 2003

	All children with a disability		Children with a profound or severe core activity limitation	
Main disabling condition	Number ('000)	Per cent of all children	Number ('000)	Per cent of all children
Intellectual	85.0	2.2	50.2	1.3
Psychiatric	47.5	1.2	22.8	0.6
Sensory/speech	60.2	1.6	37.8	1.0
Acquired brain injury	*3.0	*0.1	**0.5	—
Physical/diverse	122.2	3.2	54.0	1.4

Note: Main disabling condition' is defined as the condition that caused the most problems compared with any other disabling conditions.

Source: AIHW analysis of ABS 2003 Survey of Disability, Ageing and Carers confidentialised unit record file.

Less than half of the children whose main disabling condition was physical were at the more severe end of the disability spectrum, with a profound or severe core activity limitation. Nevertheless, this physical/diverse group was still the largest group (at 1.4% of children) for the subset of those with a more severe disability, though closely followed by the intellectual conditions (1.3% of children).

Mortality

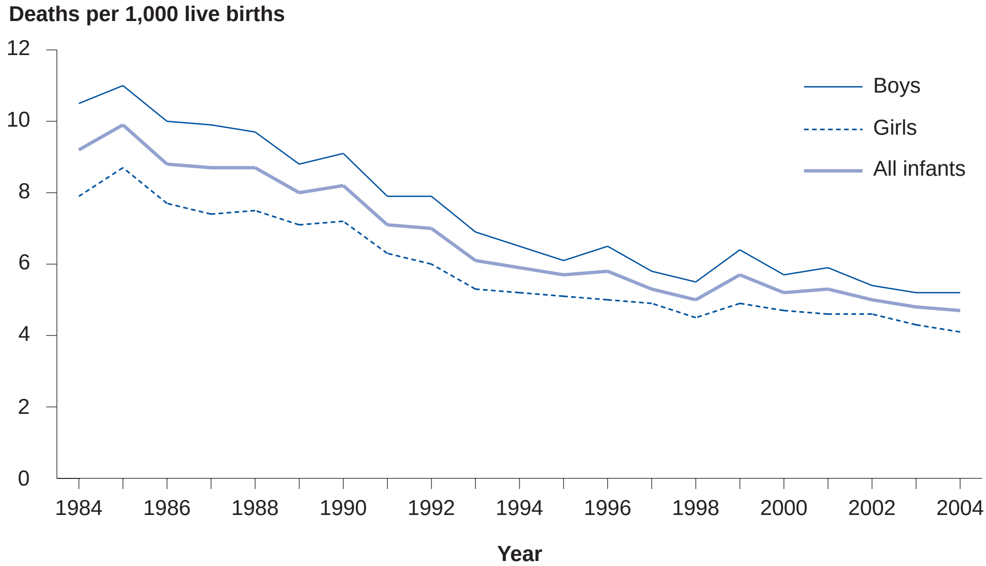
How many children die in Australia?

Deaths in children are now relatively uncommon events. In 2004, there were 1,753 deaths in children aged under 15 years, or less than one death in every 2,000 children. More importantly, the risk of death decreases substantially as children grow: 68% of the deaths were in babies under one year of age (and most of these in the early months of life), another 15% in the 1–4 age group, and the remaining deaths were fairly evenly distributed in the next two 5-year age groups.

Are death rates falling?

Death rates for infants and children have declined steadily over many years. Infant mortality rates fell by 94% between 1912 and 2003 (AIHW 2006a). Declines in child mortality rates have been equally dramatic, with falls over the same period of 95% among those aged 0–4 years and 94% among those aged 5–14 years.

These death rates have continued to decline over the last two decades, having approximately halved during the period for both infants and children. In 1984, fewer than 1 out of every 100 babies born alive died in their first year of life (Figure 5.2). By 2004, that figure had fallen to under 1 in 200 live births. The death rate for baby boys has remained higher than for baby girls throughout this period.



Source: AIHW Mortality Database.

Figure 5.2: Infant mortality rates, 1984–2004

Box 5.2: Diabetes is increasing among the young

Diabetes is a condition in which the body cannot properly use its main energy source, the sugar glucose, due to a deficiency in the hormone insulin. Diabetes is marked by an abnormal build-up of glucose in the blood and it can have serious short- and long-term effects.

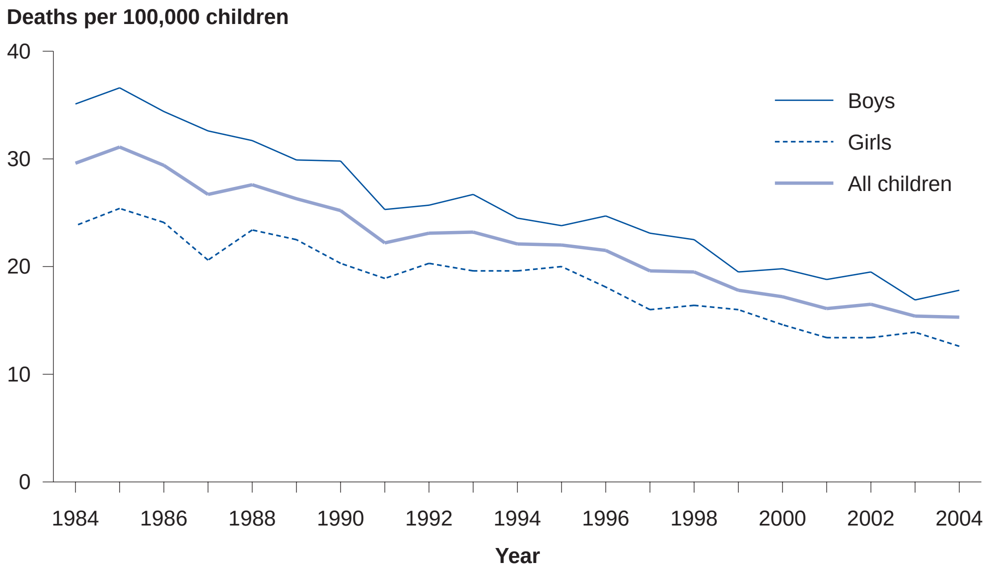
There are two main types of diabetes, Type 1 and Type 2. Type 1, marked by a total or near-total lack of insulin, mostly occurs before the age of 40 and accounts for the vast majority of diabetes cases in children. Type 2 cases have insulin that is reduced in its effect, amount or both. While Type 2 diabetes mostly begins after the age of 40, the condition is also now affecting children (McMahon et al. 2004).

Although diabetes only affects a small proportion of children, the impact of the disease on their health is often severe, both during childhood and later in life. The latest national data indicate that there were around 980 new cases of Type 1 diabetes in children under 15 years of age registered on the National Diabetes Register (NDR) in 2004, an incidence rate of 24.6 per 100,000 children (AIHW 2006b). Information on the prevalence of diabetes in children is limited. However, estimates based on parent reports in the National Health Survey indicate that around 0.1% of children in 2001 had diabetes (ABS 2006).

Evidence indicates that the incidence of Type 1 diabetes is increasing among children. The NDR is relatively new, and cannot yet be used to assess any trend in incidence. However, recent state-based studies show an increase (Haynes et al. 2004; Taplin et al. 2005).

While infant mortality rates have fallen substantially in Australia, our rates are only at about the middle of OECD countries (OECD 2005). In 2003, our rate of 4.8 per 1,000 live births was double the lowest rate of 2.4 in Iceland. Other countries with low rates included Finland, Sweden and Japan, where the rate is around 3 per 1,000 live births.

Child mortality rates have also continued to fall in recent decades. Just under 30 out of every 100,000 children aged 1–14 years died in 1984 (Figure 5.3). By 2004 that figure had fallen close to 15 per 100,000 children. Again, death rates for boys were higher than for girls.



Source: AIHW Mortality Database.

Figure 5.3: Mortality rates for children aged 1–14 years, 1984–2004

What do children die from?

In 2004, the three leading single causes of death in children were related to complications of the baby's birth or prematurity and low birthweight: 8% of deaths under the age of 15 years were due to maternal complications of the pregnancy, 6% due to disorders related to short gestation or low birthweight, and 5% due to complications of the placenta, cord or membranes (Table 5.6). The next two most frequent causes were sudden infant death syndrome (SIDS) (4%) and 'other ill-defined and unspecified causes of mortality' (4%). In total, the top eight leading causes of death in this age group accounted for 39% of their deaths.

There have been significant changes in the causes of death among children during the last century (AIHW 2006a). At the beginning of the 20th century, the two largest cause-of-death groups for those aged 0–4 years were diarrhoea and perinatal conditions. By 2000, for both sexes, perinatal conditions were the leading cause of death, followed by congenital conditions. It should be noted that death rates from perinatal and congenital conditions both fell markedly during the century—it is just that rates from other causes fell even more, especially those from infections.

Table 5.6: Leading causes of death among those aged 0–14 years, 2004

Cause of death	Per cent of deaths
Fetus and newborn affected by maternal complications of pregnancy	8.4
Disorders related to short gestation and low birthweight, nec	5.8
Fetus and newborn affected by complications of placenta, cord, membranes	5.0
Sudden infant death syndrome (SIDS)	4.1
Other ill-defined and unspecified causes of mortality	3.9
Other congenital malformations of heart	2.7
Unattended death	2.5
Malignant neoplasm of brain	2.4

Note: Cause-of-death groups analysed at the three-digit ICD-10 level.

Source: AIHW Mortality Database.

Changes also occurred in the causes of death for those aged 5–14 years. Early in the 20th century, infectious diseases (mainly tuberculosis) accounted for by far the greatest proportion of deaths, followed by injury and poisoning. Over the century, there was a large fall in death rates from infectious diseases. This left injury and poisoning the leading cause of death in this age group, even though there had been a marked fall in death rates from this cause as well.

Box 5.3: Asthma is a leading reason for hospitalisation

Asthma affects a large number of children in Australia. Estimates of the prevalence of current asthma in children range from 14% to 16%, based on self-report (ACAM 2005). A higher proportion report recent wheeze and a lower proportion have objective evidence of the airway abnormality that is typical of asthma. The prevalence of asthma in children in Australia is high by international standards.

Asthma is one of the leading reasons for children to visit GPs and to be admitted to hospital. It is the fourth most frequently managed problem by GPs in children. It was also the fourth most common reason for hospitalisation for those aged 0–4 years in 2003–04, and the fifth most common for those aged 5–9 years (see Table 5.3). For children under the age of 15 years, there were over 16,000 hospitalisations for asthma in 2003–04. These admissions represent severe episodes of the disease.

The proportion of GP encounters with children at which asthma is managed as a problem, and the rate of hospital admissions for asthma among children, have both declined since the late 1990s.

Box 5.4: Injury remains a leading cause of death and disability

Injury is the leading cause of death and a major cause of disability in children aged 5–14 years. The injury group is also the most common reason for hospitalisation in that age group. In addition, many children are treated in hospital emergency departments for an injury or poisoning.

There were 276 injury and poisoning deaths in 2003 in children aged under 15 years, which is one in six of all deaths in children. While death rates from injury remain an important cause of death in children, it is important to note that the death rate has declined substantially over time and continues to fall—by 64% between 1982 and 2003.

Injury and poisoning is one of the main reasons children were hospitalised in 2003–04, accounting for over 67,000 or 12.4% of hospital episodes for this age group. The most common external causes of these hospitalisations are falls, accidents to cyclists and accidental poisonings.

Childhood mortality, morbidity and disability resulting from injuries and poisonings are highly preventable. Strategies for preventing childhood injury include child-resistant closures to prevent accidental poisoning, compulsory use of seatbelts in private vehicles, and pool fencing to prevent drowning.

5.2 Determinants of health

There are many factors that influence the health of children, both during their childhood and also later in life. This section focuses on the main determinants of children's health, and hence parallels Chapter 3 of this report, which examines determinants for the whole population.

Nutrition

The types and quantity of food children eat have an important influence on their health. While the choices of food available have increased over time, it is not clear whether this has improved children's diet overall. One area of particular concern is the increase in energy intake which has also accompanied a decrease in many areas of physical activity. The combination of these two factors has led to a rise in the proportion of children who are overweight or obese.

Breastfeeding

Breastfeeding is one of the most important health behaviours to promote the survival, growth, development and health of infants and young children. Breastfeeding helps protect against many conditions, such as diarrhoea, respiratory infection, middle ear infections, SIDS, diabetes, and allergic diseases such as eczema and asthma (American Academy of Pediatrics 1997; NHMRC 2003a).

Australia's national dietary guidelines strongly recommend breastfeeding for the sake of children's health. The recommendation is that breastfeeding should be the only food necessary for infants up to about six months (NHMRC 2003a).

Data from the ABS 2001 National Health Survey show that, in 2001, 87% of children aged 0–3 years had been breastfed to some extent, with or without milk or milk substitutes. The survey's information on exclusive breastfeeding shows a different picture: 54% of babies were exclusively breastfed for at least the first three months. However, only 32% of babies were fed according to the dietary guidelines of being exclusively breastfed to the age of six months.

Nutrition during childhood

There is evidence in Australia that children's intake of energy has increased in recent times (Cook et al. 2001; Magarey et al. 2001). This increase may have occurred for a number of reasons. First, there are factors changing the diet of the whole population that also affect children. For example, there are many foods available now that are highly refined and calorie dense. These foods are often more convenient and pleasurable to eat. However, they are often less filling than more nutritious foods, prompting children and adults to eat more in order to feel full. In parallel, fresh fruit and vegetables may be difficult to obtain or more expensive to buy in some areas (especially in regional and remote parts of Australia), and are less aggressively marketed. Second, there are a number of factors that affect children in particular. Highly refined foods are often marketed specifically towards children (Zuppa et al. 2003) and children may be more vulnerable to such marketing.

Physical activity

A whole-of-population shift to more sedentary lifestyles has occurred in many developed countries, including Australia (AIHW 2004b). In particular, children are far less likely than children of previous generations to use walking or cycling as a means of transport or to play outdoors.

Changes in children's entertainment choices have also contributed to an increase in sedentary behaviour. Playing console and computer games and watching television and DVDs/videos are very popular leisure pursuits among children (ABS 2001a). Coupled with increased access to the Internet and mobile phones, children need not even leave home to maintain contact with their friends outside school hours.

The Australian Government has recently developed Physical Activity Recommendations for Children and Young People. These are that they should:

- participate in at least 60 minutes (and up to several hours) of moderate- to vigorous-intensity physical activity every day
- not spend more than two hours a day using electronic media for entertainment (for example computer games, Internet, TV), particularly during daylight hours.

National data on levels of physical activity in children are not available. However, the NSW Schools Physical Activity and Nutrition Survey (SPANS) 2004 found that, based on self-reported data relating to the summer school terms, 87% of boys and 77% of girls in Year 8 (aged approximately 13–14 years) met the recommendation for at least one hour of moderate- to vigorous-intensity exercise each day (Booth et al. 2006). The results for the winter terms were about 10 percentage points lower. Encouragingly, these results suggest a large increase in physical activity levels compared to earlier data analysed against the same recommendation. The summer results in 1997 indicate that only 57% of boys and 51% of girls in Year 8 met the recommendation.

More concerning are the results from SPANS on the proportion of children who are spending more than the recommended two hours per day using electronic media for entertainment: 61% of boys and 45% of girls in Year 6 (aged approximately 11–12 years) were engaging in more than two hours per day of small-screen recreation. The proportions increased even further in the older age groups: in Year 10, 78% of boys and 67% of girls fell into this group. No information over time is available from SPANS for this measure.

Body weight

For children, there are two key—and contrasting—determinants related to body weight. The first is low birthweight, as the increased risk of health problems associated with low birthweight is well documented. The second is excess body weight, where the increased risk is again well established.

How many babies are born with a low birthweight?

As mentioned in Chapter 4 of this report, a key indicator of infant health is the proportion of babies with a birthweight of less than 2,500 grams. Low-birthweight babies have a greater risk of poor health and are more likely to develop significant disabilities.

In 2003, 6.3% of all Australian babies born alive were of low birthweight. Compared to other OECD countries, Australia's rate is about in the middle. The lowest rates for OECD countries in 2002 were in the range of 4–4.5%, compared to Australia's rate in that year of 6.4%.

Children are becoming heavier

The increasing prevalence of overweight and obesity in Australian children is a serious public health problem (Catford & Caterson 2003; Waters & Baur 2003). Rates of obesity are rising alarmingly in many parts of the world, and this trend is not restricted to adults. In Australia, the prevalence of obesity in children has jumped markedly in all age groups and for both boys and girls over the past few decades (Booth et al. 2003; Booth et al. 2006; Magarey et al. 2001). Obesity in children is a major concern, not only because of health problems in the short term, but also because there is a high risk it may continue into adulthood and affect long-term health.

In the short term, children who are overweight or obese frequently experience psychosocial problems such as poor body image, disordered eating and low self-esteem. Such children may also develop a range of health problems, including asthma, sleep apnoea and early development of risk factors for heart disease such as raised blood pressure (Royal College of Physicians of London 2004). Even Type 2 diabetes—a chronic disease traditionally diagnosed only among adults—is now increasingly being detected among Australian children. Research also shows that young people who were overweight or obese as children are likely to be overweight as adults (Whitaker et al. 1997). This in turn can lead to a number of serious chronic conditions and even premature death, as discussed in Chapter 3 of this report.

How many children are overweight or obese?

Overweight and obesity are measured by the body mass index (BMI), which is the ratio of weight in kilograms to the square of height in metres (kg/m^2). BMI is used to categorise people into one of four groups: underweight, normal weight, overweight or obese. In contrast to adults, where individuals are allocated to these four groups based on fixed BMI points, children are considered to be overweight or obese if their BMI exceeds the cut-off point for their particular age (NHDC 2003).

BMI can be derived from self-reported or measured data, with the latter being preferred whenever possible (AIHW 2003b). There are limited national measured data on overweight and obesity in Australian children. The most recent come from measurements taken in the 1995 ABS National Nutrition Survey. From that survey, an estimated 4.7% of boys and 5.5% of girls aged 7–15 years were obese, and a further 15.3% of boys and 16.0% of girls were overweight but not obese (Magarey et al. 2001).

Booth and others (2003) analysed BMI from measured data collected in various state surveys between 1967 and 1997. They showed that from the mid-1980s to the mid-1990s the prevalence of obesity tripled and that of overweight (including obesity) doubled among those aged 7–15 years, compared with a much smaller rate of increase over the preceding 16 years. More recently, results from the 2004 SPANS survey in schools in New South Wales show a continued increase in overweight and obesity among children (Booth et al. 2006). Between 1997 and 2004, the percentage of boys in school years 2, 4, 6, 8 and 10 (aged up to approximately 16 years) who were obese increased from 5.0 to 7.7%. For girls, the increase was from 4.4 to 6.3%. Results for the overweight but not obese over the same period show an increase from 15.2 to 18.4% for boys, and from 16.1 to 17.4% for girls.

Tobacco smoking

Tobacco use is the risk factor associated with the greatest disease burden in Australia, responsible for about 10% of the total burden (AIHW: Mathers et al. 1999). The detrimental health effects of tobacco smoking are well established and are outlined in Chapter 3. Smoking can reduce health and fitness during childhood, but children who become smokers are also faced with a significant health disadvantage in adulthood unless they are able to give up smoking. Unfortunately, many will go on to become lifelong smokers. Not only are smokers at much greater risk of lung cancer than non-smokers, but the risk also increases markedly the younger they started smoking (Chen & Boreham 2002).

How many children smoke?

The latest national data show that only a small proportion of children aged 12–14 years are current smokers—less than 2% (Table 5.7). The proportion of this age group who have never smoked is over 97%. There is very little difference in smoking patterns between girls and boys of this age.

There is evidence of declines in smoking rates among those aged 12–14 years over the years 1984 to 2002 (AIHW 2005a). Results from the Australian Secondary Schools Alcohol and Drug survey show an encouraging decline from around 17% of this age group having smoked at least once in the week before being surveyed in 1984, to around 9% in 2002. Note that these survey results are not comparable with those presented in Table 5.7, but they do provide an indication of the trend in smoking among children.

How many children are exposed to tobacco smoking in the home?

The health effects on children of inhaling second-hand smoke, or passive smoking, are well documented. Passive smoking is associated with respiratory infections, middle ear infections and more frequent colds, onset and severity of asthma, decreased lung function, eye and nose irritation, and SIDS (ACAM 2005; DiFranza et al. 2004; NHMRC 1997). Children in households with a smoker are more likely to take up smoking themselves (Darling & Reeder 2003).

Table 5.7: Tobacco smoking among children aged 12–14 years, 2004 (per cent)

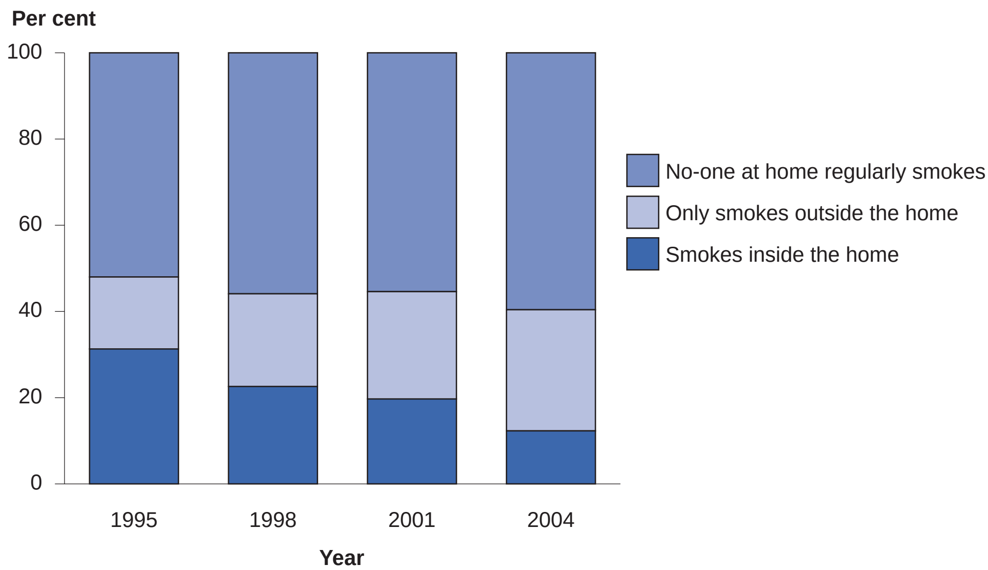
Smoking status	Boys	Girls	Children
Current smokers			
Daily	1.0	1.4	1.2
Less than daily	0.5	0.4	0.5
Total current	*1.5*	*1.8*	*1.6*
Ex-smokers[(a)]	1.2	0.6	0.9
Never smoked[(b)]	97.2	97.6	97.4

(a) Smoked at least 100 cigarettes (manufactured and/or roll-your-own) or the equivalent amount of tobacco in their life, and no longer smoke.

(b) Never smoked 100 cigarettes (manufactured and/or roll-your-own) or the equivalent amount of tobacco in their life.

Source: AIHW analysis of 2004 National Drug Strategy Household Survey.

Results from the National Drug Household Surveys over the decade 1995–2004 show that the proportion of households with dependent children which also have a member who smokes inside declined from 31% in 1995 to 12% in 2004 (Figure 5.4). This indicates that children are now less exposed to tobacco smoke in the home. However, the proportion of such households that include a smoker, whether they smoke inside or out, has remained fairly constant at around 40–45%.



Source: AIHW analysis of National Drug Strategy Household Surveys.

Figure 5.4: Smoking status of households with children under 15 years of age, 1995–2004

Alcohol use

Risky drinking in the short term, which may also be referred to as binge drinking, is when a person drinks heavily over a short period of time. This behaviour can have several undesirable effects on the health and wellbeing of children, including alcohol poisoning, accidents, violence and unprotected sex (Grant & Dawson 1997; NDARC 2004). Long-term excessive use of alcohol can lead to a number of physical, emotional and social problems, including alcohol addiction, liver, heart and brain damage, depression, and family and relationship problems (NDARC 2004).

The most recent national data on risky drinking by those aged 12–14 years indicate that around one-quarter of this age group drink alcohol to some extent (Table 5.8). The vast majority of these children fall in the low-risk groups for both short- and long-term harm. However, 1.7% of those aged 12–14 years drink at levels that put them at risk or high risk for short-term problems; and 0.4% in the long-term risky or high-risk group (0.3% were in both of these higher risk groups).

Table 5.8: Alcohol-related long- and short-term risk, children aged 12–14 years, 2004 (per cent)

		Short-term risk		
Long-term risk	**Abstainer**	**Low risk**	**Risky or high risk**	**Total**
Abstainer	75.9	. .	. .	75.9
Low risk	. .	22.5	1.3	23.8
Risky or high risk	. .	—	0.3	0.4
Total	**75.9**	**22.5**	**1.7**	**100.0**

Note: Numbers may not add to totals due to rounding.

Source: AIHW analysis of 2004 National Drug Strategy Household Survey.

Vaccination status

Childhood vaccination has been routinely used for over 50 years in Australia and has had a significant impact on the morbidity and mortality associated with many diseases (Gidding et al. 2001). Diseases targeted by the Australian childhood vaccination program in 2005 were diphtheria, tetanus, whooping cough (pertussis), poliomyelitis, measles, mumps, rubella, *Haemophilus influenzae* type b (Hib) and hepatitis B. A schedule of vaccination is provided in the Australian Immunisation Handbook (NHMRC 2003b) and sets out the time frames (from birth) for administering the vaccine for each disease.

How many children have been vaccinated?

For Australia as a whole, vaccination coverage (see Box 5.5) at one year of age calculated at 31 December 2005 was 91.0% (Table 5.9). Western Australia had the lowest proportion of children fully vaccinated at one year of age at 88.8% and the Australian Capital Territory had the highest at 93.7%. Vaccination coverage for Australia at one year of age was highest for the hepatitis B vaccine (94.8%) and the Hib vaccine (94.4%) and lowest for the poliomyelitis vaccine (92.3%).

The proportion of children fully vaccinated at two years of age was marginally greater at 92.1%. For the coverage of individual vaccines at two years of age, Hib vaccine was the lowest at 93.6%, and hepatitis B vaccine was the highest at 95.9%. Diphtheria, tetanus and pertussis coverage for this age group increased substantially in all jurisdictions from earlier reports due to the removal of the 4th dose of diphtheria, tetanus, pertussis (due at 18 months) from the immunisation schedule from the December 2003 quarter onwards. Vaccination coverage at six years of age was considerably lower at 84.0%, and was almost identical for all three individual vaccines due at this time.

Recorded coverage at all three milestone ages is less than 100% due to both under-reporting of vaccinations to the Australian Childhood Immunisation Register (ACIR; see Box 5.5) by providers and incomplete vaccination uptake. The main reason for the latter is parents disagreeing with or having concerns about vaccination (Hull et al. 2002).

Box 5.5: Monitoring vaccination rates

Vaccination coverage in Australia is monitored through the Australian Childhood Immunisation Register (ACIR), operated by Medicare Australia with the cooperation of the state and territory health departments. The basis of the ACIR is vaccination data since 1 January 1996 for Australian children under seven years of age. The register is updated from Medicare enrolments to obtain the total number of children in Australia under seven years of age. The vaccination status of each child is updated when a vaccination provider administers the age-appropriate vaccination and notifies the ACIR of this vaccination encounter. Vaccination coverage estimates are reported as the percentage of a three-month birth cohort of children who are up to date for the relevant vaccinations by the time they are one year, two years, and six years of age (O'Brien et al. 1998).

Table 5.9: Proportion of children vaccinated at one year of age[(a)], two years[(b)] and six years[(c)], assessment date 31 December 2005

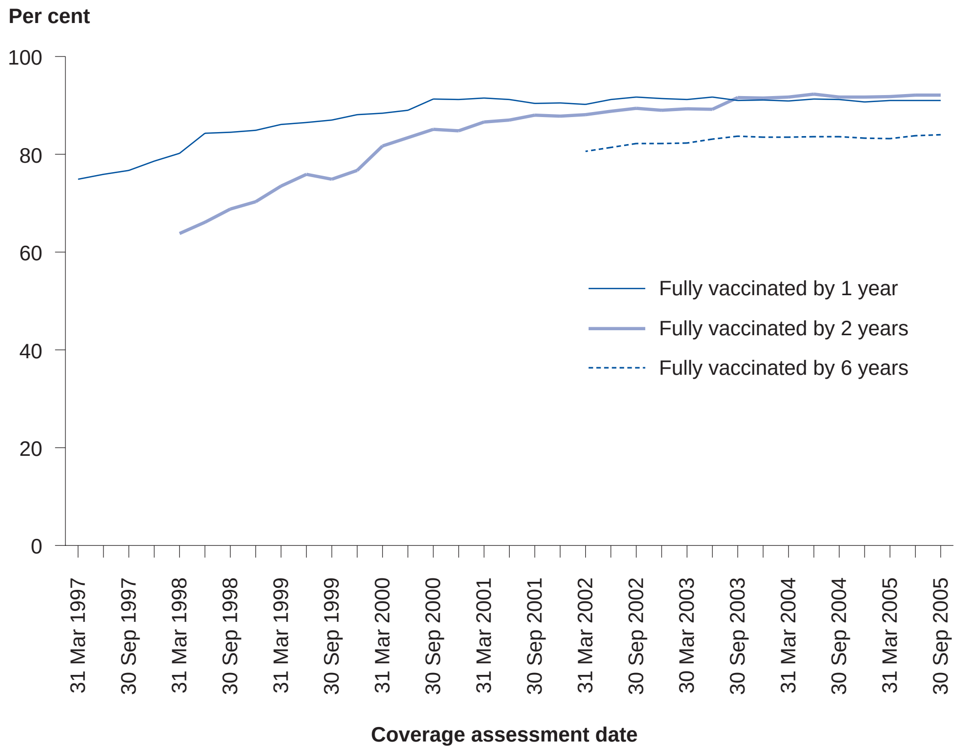
	Age (years)		
	One	Two	Six
Number of children	65,709	66,700	68,743
Diphtheria, tetanus and pertussis (%)	92.4	95.2	85.1
Poliomyelitis (%)	92.3	95.2	85.2
Haemophilus influenzae type b (%)	94.4	93.6	. .
Measles, mumps and rubella (%)	. .	93.8	85.2
Hepatitis B (%)	94.8	95.9	. .
Fully immunised (%)[(d)]	**91.0**	**92.1**	**84.0**

(a) Aged 12–15 months at 30 September 2005.
(b) Aged 24–27 months at 30 September 2005.
(c) Aged 72–75 months at 30 September 2005.
(d) Fully immunised = no. children vaccinated/no. children in register × 100.
Source: Australian Childhood Immunisation Register.

Figure 5.5 shows the trends in vaccination coverage from the first ACIR-derived published estimates in 1997 to September 2005. There is a clear trend of increasing vaccination coverage over time for children aged one, two and six years; however, the rate of increase has slowed dramatically over the past three years, especially for children in the one-year and two-year age groups.

Family and social environment

Research has shown that a child's family and social environment can significantly influence their health and wellbeing. For example, living in a family with low income can affect a child's nutrition, their access to medical care, the safety of their environment, the level of stress in the home, and the quality and stability of their care (Shore 1997). Another component of socioeconomic position, the education level of parents, has also been shown to be an important determinant of the health of children (Spurrier et al. 2003). Compared with better-off children, those in lower income groups tend to have worse mental and physical health, social functioning, educational attainment and future employment prospects.



Source: Australian Childhood Immunisation Register.

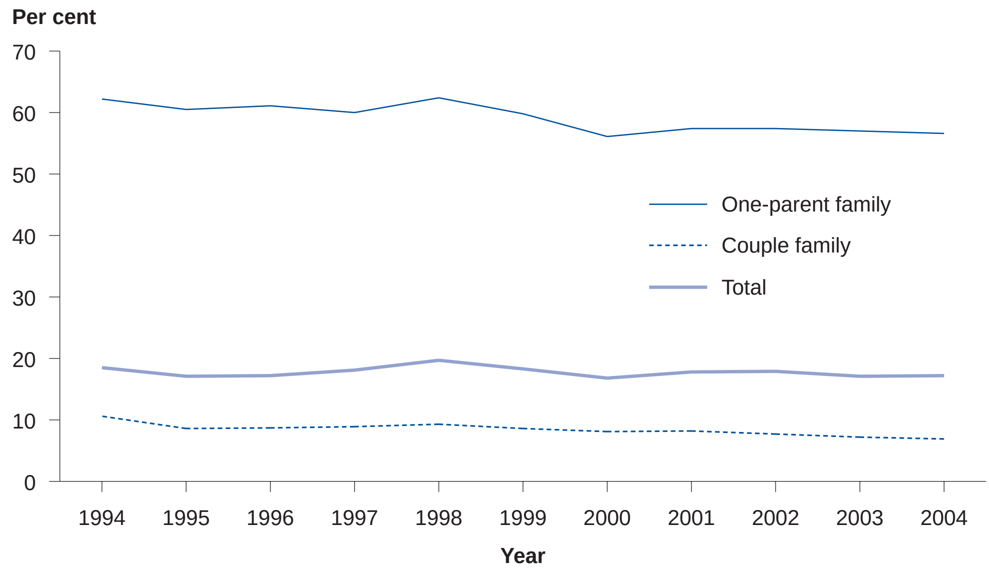
Figure 5.5: Vaccination rates for children at one, two and six years, 1997–2005

Current available data in Australia are not adequate to fully explain the influences these environmental factors will have on health and other outcomes for children. With the limited data available, it is possible to examine the family and community contexts that children are currently living in, but it is much more difficult to show how these contexts have influenced their health. One area of a child's family and social environment, parental unemployment, is discussed below.

Parental unemployment

Information on children living in families with no employed parent can be used as one indicator of disadvantage. Studies show that these children are at a disadvantage compared to other children from two perspectives: not only is unemployment likely to produce immediate financial hardship, but the absence of a working role model may also reduce a child's long-term prospects for their own employment.

The proportion of all children under 15 years living in families without an employed parent fell from 19% in June 1994 to 17% in June 2004, although with some fluctuation (Figure 5.6). Over the period, the proportion was considerably higher for children in one-parent families than in couple families. In 2004, among children who lived in couple families, 7% lived in families where neither parent was employed. Of children who lived in one-parent families, 57% lived in families where the parent was not employed.



Source: ABS various years.

Figure 5.6: Children aged 0–14 years living in families where no parent is employed, June 1994 to June 2004

The actual number of children living in families with no parent employed has changed very little during this period (704,000 in 1994 and 690,000 in 2004). What has changed is the types of families these children live in. In 1994, 52% of these children lived in one-parent families. By 2003, this figure had increased to 68%.

5.3 Health of population groups

Previous sections of this chapter have covered the health of Australia's children in general terms. However, as with adults, we know that illness, disability, mortality and determinants are not evenly distributed among children—some groups fare worse than others.

This section examines this variation by presenting available information on the health of some specific groups of children. This parallels the information presented in Chapter 4 on the health of population groups for all ages. Since information on the health of child populations is not comprehensive, the discussion here is confined to Aboriginal and Torres Strait Islander peoples, socioeconomic groups and children living in rural areas.

Aboriginal and Torres Strait Islander children

As for other age groups, Aboriginal and Torres Strait Islander children suffer worse health than other Australians of the same age. While information is not available for all areas presented earlier in this chapter, the pattern is clear from statistics on low birthweight, mortality, hospitalisation and disability.

Low birthweight

The proportion of live-born babies with low birthweight (less than 2,500 grams) born to Indigenous mothers in 2003 was 12.9%. This is more than double the percentage for babies of non-Indigenous mothers (6.0%) (AIHW NPSU 2005).

Infant mortality

During the period 1999–2003, there were 469 deaths (15 deaths per 1,000 live births) among Indigenous infants in Queensland, Western Australia, South Australia and the Northern Territory (the only areas for which coverage of Indigenous people in deaths data is considered complete enough for statistical reporting). The rate of deaths for Indigenous infants was about 3 times that of non-Indigenous infants (4.5 per 1,000 live births), and was higher than the rate in all except two of the 29 other OECD countries—Mexico and Turkey. Large differences between the death rates for Indigenous and non-Indigenous babies were found for perinatal conditions, 'symptoms, signs and ill-defined conditions', respiratory diseases and injuries (ABS & AIHW 2005).

Child mortality

According to data from Queensland, Western Australia, South Australia and the Northern Territory, Indigenous children aged 1–14 years died in 1999–2003 at a rate of 39.0 per 100,000 children, compared with 16.1 deaths per 100,000 among other Australian children—almost two and a half times as high.

Again, Indigenous children had higher death rates than non-Indigenous children for nearly all cause-of-death groups (Table 5.10). The exception was neoplasms (mostly cancers), where both groups had the same rate. The largest rate ratios (ratio of Indigenous rate to non-Indigenous rate) were for infectious and parasitic diseases (rate ratio of 5.0) and 'symptoms, signs and ill-defined conditions' (4.3). However, the largest rate difference (Indigenous rate minus non-Indigenous rate) was for injuries and poisonings, with 11.2 extra deaths per 100,000 in Indigenous children compared with non-Indigenous children.

Hospitalisations

Hospitalisation rates for Indigenous children in 2003–04 were higher than those for other Australian children. Based on data from Queensland, South Australia, Western Australia and the Northern Territory, the rate ratio for infants was 1.7 (874 compared to 515 hospitalisations per 1,000 infants). The discrepancy for children aged 1–14 years was less—a rate ratio of 1.4. However, although the identification of Indigenous patients in hospital statistics has been improving, these statistics are still likely to be affected by under-identification of Indigenous people.

Table 5.10: Causes of death for children aged 1–14 years, by Indigenous status, 1999–2003

	Deaths per 100,000 children			
Cause of death group	**Indigenous**	**Non-Indigenous**	**Rate ratio**	**Rate difference**
Injuries and poisonings	18.5	7.3	2.5	11.2
Diseases of the nervous system	4.1	1.6	2.5	2.5
Neoplasms	2.8	2.8	1.0	0
Infectious and parasitic diseases	2.6	0.5	5.0	2.1
Congenital malformations	2.6	1.1	2.4	1.5
Diseases of the circulatory system	2.4	0.6	3.8	1.8
Symptoms, signs and ill-defined conditions	2.0	0.5	4.3	1.5
All other causes	2.0	0.6	3.5	1.4
Diseases of the respiratory system	1.8	1.1	1.7	0.7
Total	**39.0**	**16.1**	**2.4**	**22.9**

Note: Rate ratio is the ratio of the Indigenous rate divided by the non-Indigenous rate. Rate difference is the Indigenous rate minus the non-Indigenous rate. Data are for Qld, SA, WA and NT only.

Source: AIHW Mortality Database.

In keeping with higher overall hospitalisation rates, Indigenous children have higher rates than other Australian children for many diagnoses. For infants, the highest rate ratios were for respiratory diseases (3.9) and skin diseases (3.6). For children aged 1–14 years, the highest rate ratios were for circulatory diseases (2.7) and skin diseases (2.1).

Disability

Little is known about the level of disability among Australia's Indigenous children, although it is believed that the rate of disability among Indigenous people generally is high (AIHW 1997). It is known that Indigenous children have a high rate of hearing problems due to middle ear infections (Couzos et al. 2001; Zubrick et al. 2004).

Vaccination rates

There are varying estimates of the level of vaccination coverage among Australia's Indigenous children, from their being much lower than those for other Australian children to about the same. This variation arises from the difficulties or inadequacies in data collection. Among Indigenous Australian children, vaccination coverage tends to be higher in remote areas than in non-remote areas.

The National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases used the ACIR to produce coverage estimates for Indigenous children at 31 December 2003 (NCIRS 2004). These data indicated that, at one year of age, vaccination rates were lower in Indigenous children than among non-Indigenous children. However, by two years of age, the rates were very similar.

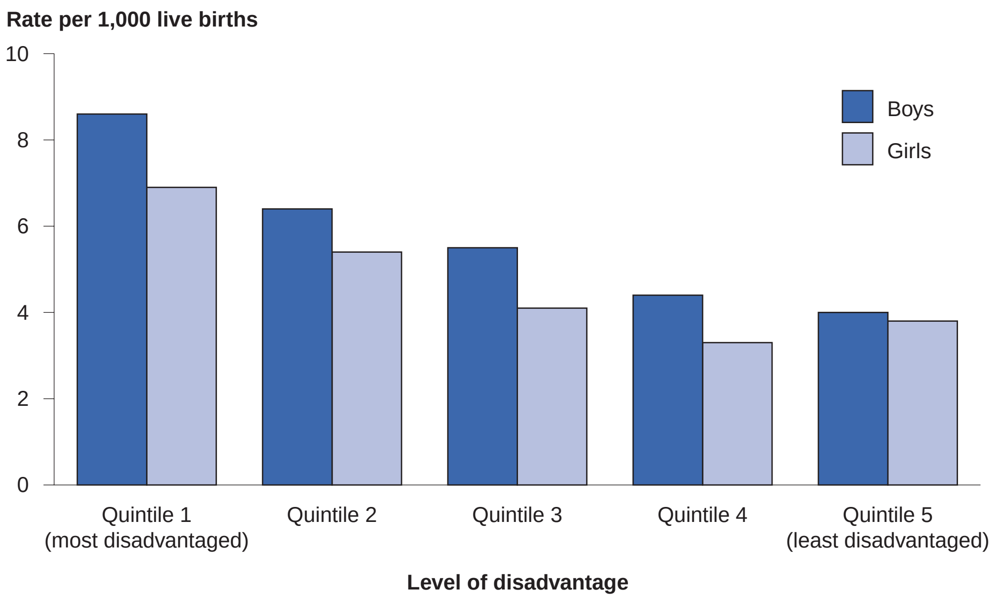
Socioeconomic groups

The socioeconomic gradient in health applies to children just as much as it does for the rest of the population. That is, children in lower socioeconomic groups generally have worse health than children in higher socioeconomic groups. The differences are not just apparent at the two socioeconomic extremes, but rather are evident between each step in socioeconomic position.

Information presented here uses an area-based measure of socioeconomic position. That is, children are grouped based on the socioeconomic characteristics of the area in which they live. The index used here is the Index of Relative Socioeconomic Disadvantage—one of the Socioeconomic Indexes for Areas, which is derived by the ABS using information collected in the Census. This index is derived from selected attributes of small areas, including the proportion of the population with low income, low educational attainment, jobs in relatively unskilled occupations or unemployed (ABS 2001b).

Infant mortality

The infant mortality rates for 2000–2002 were higher in areas that had higher levels of disadvantage (Figure 5.7). Infants from the most disadvantaged areas were twice as likely as those from the least disadvantaged areas to die before they reached their first birthday (7.8 deaths per 1,000 live births compared with 3.9 per 1,000). Rates were higher for boys than for girls in all socioeconomic groups. Further, the gap between the most and least disadvantaged groups was larger for boys than for girls, both in absolute and relative terms.

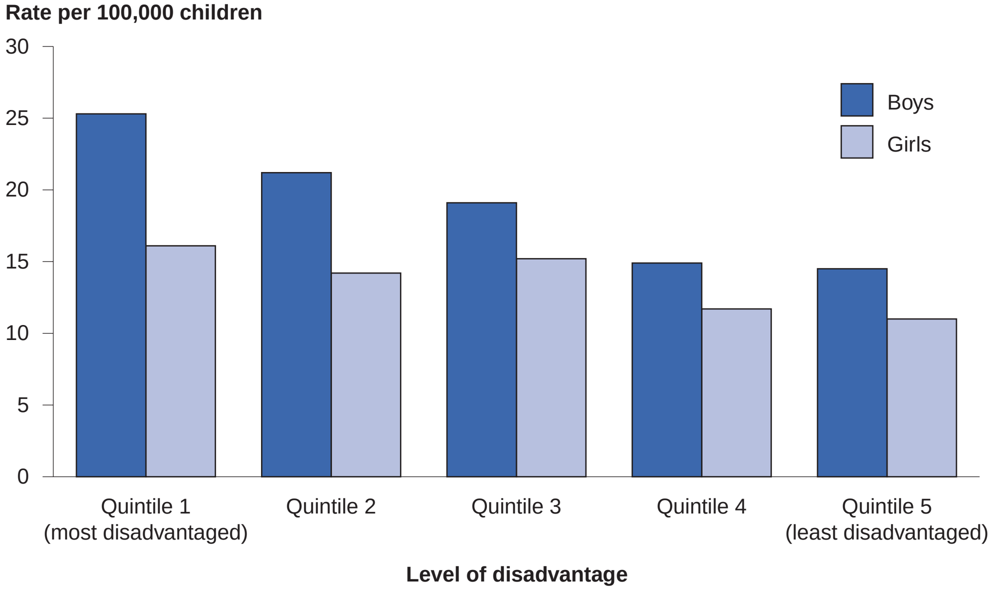


Source: AIHW Mortality Database.

Figure 5.7: Infant mortality rates, by socioeconomic disadvantage, 2000–2002

Child mortality

As was the case for infant (under one year) mortality, the death rates for children aged 1–14 years in the period 2000–2002 rose with increasing socioeconomic disadvantage: by about 75% for boys and 46% for girls (Figure 5.8). The difference in rates between the most and least disadvantaged groups was statistically significant for both boys and girls.



Source: AIHW Mortality Database.

Figure 5.8: Mortality rates for children aged 1–14 years, by socioeconomic disadvantage, 2000–2002

Exposure to tobacco smoke at home

Children in relatively disadvantaged households in 2001 were more likely than other children to be exposed to second-hand tobacco smoke (AIHW 2005a). For example, 26% of households in the most disadvantaged quintile had members who smoked inside compared with 10% of households in the least disadvantaged quintile.

Children in regional areas

The health of people living in geographically isolated areas of Australia is often poor compared with those living in major cities and other urban locations. The reasons for their poorer health status include limited availability and access to health services and exposure to different health and environmental risks (AIHW 2003c). The poorer health of the child population in remote areas is also at least partly a reflection of the large proportion of the population in those areas who are Indigenous, coupled with the poorer health of Indigenous children compared with other Australian children.

Mortality

Infant deaths classified by the ABS Australian Standard Geographical Classification remoteness categories (see Chapter 4) indicate that during the period 2000–2002, 2,303 infants died in Major Cities, 1,297 in regional areas, and 246 in Remote and Very Remote areas. The rate of infant mortality by these categories varied from 4.6 deaths per 1,000 live births in Major Cities to 13.6 per 1,000 in Very Remote areas. The high rate of infant mortality in Very Remote areas is a reflection of very high rates of infant mortality occurring among Indigenous people, who make up a large part of the population in these areas.

The age-standardised rate of child deaths rose in 2000–2002 with increasing remoteness: 14.6 deaths per 100,000 children in Major Cities and 41.7 per 100,000 in Very Remote areas for children aged 1–14 years. This pattern was most pronounced for children aged 1–4 years, where the rate in Major Cities was 22.2 deaths per 100,000 children compared with 59.5 in Remote and Very Remote areas combined.

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6 Health resources

The resources available to provide for the health care needs of a population are limited. Other chapters focus on the services provided by the health system and on health outcomes; this chapter focuses on the resources Australia devotes to health and how they are funded and distributed.

Broadly, the resources for health can be depicted in two ways:

- by describing the health sector's financial resources, that is, the funds that are made available for expenditure on health
- by describing the sector's physical resources, that is, its human resources (the people who provide or support health services), its capital resources (equipment, buildings, land and other assets), the materials and energy (electricity, gas and other forms) consumed during service provision, and so on.

The statistics allow us to examine the financial resources for health from two different angles. The first is those who provide the funding and the amounts of money they provide for various services and other assistance. The second is those who incur the expenditures and the amounts of money they spend on various services and other assistance. As to the physical resources for health in Australia, the available statistics refer mainly to human resources.

6.1 Health expenditure and health funding

Two terms—'health expenditure' and 'health funding'—are used to describe the financial resources used in health. They express concepts that are distinct but related (Box 6.1). Both concepts are needed for a comprehensive understanding of financial resources used by the overall health system and of resources used by the various segments of the system (such as primary care or hospitals).

This section describes major components of health expenditure and major sources of health funding. It also analyses trends in expenditure and funding during the past decade, and compares the financial resources for the Australian health system with patterns in other member countries of the Organisation for Economic Co-operation and Development (OECD).

The bulk of health spending is on health goods and services, such as pharmaceuticals and hospital care. The overall health expenditure estimates also include spending on a number of related activities, such as research and administration. But health expenditure does not include spending on such items as the training of health professionals and the 'insurance component' of private health insurance premiums; the former is regarded as expenditure on education and the latter as expenditure on insurance, so they do not appear as part of health expenditure.

Total expenditure on health is split into recurrent and capital expenditures. Recurrent expenditures, which relate largely to operating costs, are further split between the major types of health goods and services and health-related activities. Capital expenditures, which relate to large-scale investment in plant and facilities that support health services, cannot readily be split further.

> **Box 6.1: Defining health expenditure and health funding**
>
> ***Health expenditure***
>
> *Health expenditure is reported in terms of who incurs the expenditure, rather than who ultimately provides the funding for that expenditure. In the case of public hospital care, for example, all expenditures (that is, expenditure on accommodation, medical and surgical supplies, drugs, salaries of doctors and nurses, and so forth) are incurred by the states and territories, but a considerable proportion of those expenditures is funded by transfers from the Australian Government.*
>
> ***Health funding***
>
> *Health funding is reported in terms of who provides the funds that are used to pay for health expenditure. In the case of public hospital care, for example, the Australian Government and the states and territories together provide over 90% of the funding; these funds are derived ultimately from taxation and other sources of government revenue. Some other funding comes from private health insurers and from individuals who choose to be treated as private patients and pay hospital fees out of their own pockets.*

Who funds what health services?

Funding for health comes from both government and non-government sources. Different health goods and services draw on different mixes of funding sources (mainly Australian Government, or mainly state or territory government, or mainly non-government).

The Australian Government provides most of the funding for:

- services provided by general practitioners and medical specialists and other professional services that are covered or partly covered by Medicare
- high-level residential care
- pharmaceuticals that are covered or partly covered by the Pharmaceutical Benefits Scheme (PBS).

The Australian Government also funds health activities indirectly by subsidising private health insurance cover through incentive arrangements. Another avenue of Australian Government funding is through Specific Purpose Payments (SPPs) to the states and territories. The main health SPPs provided during 2003–04 were those:

- under the Australian Health Care Agreements
- under the Public Health Outcomes Funding Agreements
- for the provision of highly specialised drugs to outpatients in public hospitals
- for blood transfusion services.

The Australian Government and state and territory governments jointly fund public hospital services.

State and territory governments provide or purchase ambulance, dental and community health services; they also regulate various health activities. They provide most of the funding for these kinds of services, and they are also a major funding source for public health activities, such as infectious disease control and health promotion campaigns.

The main non-government funding sources are out-of-pocket funding by individuals and the benefits paid by private health insurance. Other non-government sources include providers of compulsory motor vehicle third party insurance and workers compensation insurance.

Health expenditure

The estimated total expenditure on health in Australia in 2003–04 was $78,598 million or 9.7% of gross domestic product (GDP) (Table 6.1). This was up from the previous year, when health accounted for 9.6% of GDP. A decade earlier, expenditure on health was 8.3% of GDP.

Table 6.1: Total health expenditure and gross domestic product, current price terms, 1993–94 to 2003–04

Year	Total health expenditure ($m)	GDP ($m)	Ratio of health expenditure to GDP (%)
1993–94	36,990	446,307	8.3
1994–95	39,216	470,168	8.3
1995–96	42,082	501,257	8.4
1996–97	45,296	527,994	8.6
1997–98	48,288	559,139	8.6
1998–99	51,440	589,597	8.7
1999–00	55,255	623,461	8.9
2000–01	61,635	668,426	9.2
2001–02	66,769	713,229	9.4
2002–03	72,452	758,147	9.6
2003–04[(a)]	78,598	811,643	9.7

(a) Based on preliminary AIHW and ABS estimates.

Sources: ABS 2005; AIHW Health Expenditure Database.

The difference between the rate at which health prices change and the general rate of inflation (that is, price changes in the economy as a whole) can have a strong influence on the ratio of health expenditure to GDP. Australia's health inflation has outpaced general inflation in most years (Table 6.2). Between 1993–94 and 2003–04, the average rate of general inflation was 2.2% a year, whereas health inflation averaged 3.1% a year.

Across the decade, estimated real growth in health expenditure (that is, after removing the effects of inflation) averaged 4.6% per year (Table 6.3). Between 1997–98 and 2002–03, growth was somewhat higher (5.1% a year on average) than it had been between 1993–94 and 1997–98 (4.2% a year). The acceleration was influenced by a rapid increase in expenditure in one year, 2000–01, when expenditure increased by an estimated 7.6% over the previous year; this reflected such influences as the strong real growth in Australian Government expenditure on pharmaceuticals, state and territory government expenditure on community health, and non-government expenditure on dental services, other professional services and aids and appliances.

Table 6.2: Annual rates of health inflation, 1993–94 to 2003–04 (per cent)

Period	Health inflation	General inflation[(a)]	Excess health inflation
1993–94 to 1994–95	2.1	1.1	1.0
1994–95 to 1995–96	3.0	2.4	0.5
1995–96 to 1996–97	2.4	1.5	0.9
1996–97 to 1997–98	3.1	1.3	1.7
1997–98 to 1998–99	2.4	0.1	2.2
1998–99 to 1999–00	2.3	1.9	0.4
1999–00 to 2000–01	3.7	5.0	–1.3
2000–01 to 2001–02	3.7	2.7	1.0
2001–02 to 2002–03	4.1	3.0	1.1
2002–03 to 2003–04	3.8	2.9	0.9
Average annual rates of inflation			
1993–94 to 1997–98	*2.6*	*1.6*	*1.0*
1997–98 to 2002–03	*3.2*	*2.5*	*0.7*
1993–94 to 2003–04	3.1	**2.2**	**0.8**

(a) Based on the implicit price deflator for GDP.

Note: Components may not add to totals, due to rounding.

Sources: ABS 2005; AIHW Health Expenditure Database.

Table 6.3: Total health expenditure and gross domestic product, constant price terms[(a)], 1993–94 to 2003–04

	Total health expenditure		GDP	
Year	Amount ($m)	Growth rate (%)	Amount ($m)	Growth rate (%)
1993–94	48,112	. .	538,345	. .
1994–95	49,973	3.9	561,020	4.2
1995–96	52,089	4.2	584,108	4.1
1996–97	54,752	5.1	606,304	3.8
1997–98	56,615	3.4	633,587	4.5
1998–99	58,918	4.1	667,168	5.3
1999–00	61,857	5.0	692,521	3.8
2000–01	66,542	7.6	707,063	2.1
2001–02	69,507	4.5	734,639	3.9
2002–03	72,452	4.2	758,147	3.2
2003–04[(b)]	75,695	4.5	788,473	4.0
Average annual growth rates				
1993–94 to 1997–98		*4.2*		*4.2*
1997–98 to 2002–03		*5.1*		*3.7*
1993–94 to 2003–04		**4.6**		**3.9**

(a) See Box 6.2 for explanation of constant price estimation.

(b) Based on preliminary AIHW and ABS estimates.

Sources: ABS 2005; AIHW Health Expenditure Database.

Box 6.2: Constant price estimates and current prices

Wherever estimates in 'constant price' (or 'constant dollar') terms are shown in this chapter, they have been adjusted to reflect the prices of the reference year, 2002–03. The aim is to remove the effects of inflation. Hence expenditures in different years can be compared on an equal dollar-for-dollar basis, using this measure of changes in the volume of health goods and services. The constant-price method is used because is not possible to derive estimates of volume by directly adding, say, the number of surgical operations to the number of pharmaceutical prescriptions.

Constant price estimates for most expenditure aggregates have been derived using the annually re-weighted chain price indexes produced by the Australian Bureau of Statistics (ABS). In some cases, however, these indexes are not available, and ABS implicit price deflators have been used instead.

The term 'current prices' refers to expenditures reported for a particular year, unadjusted for inflation. So changes in current price expenditures reflect changes in both price and volume.

Average expenditure per person

In 2003–04, Australia spent, on average, an estimated $3,931 per person on health (Table 6.4). This includes expenditures funded by government, health insurance and injury compensation insurance as well as out-of-pocket expenditures. After adjusting for inflation, estimated per person health expenditure grew at an average of 3.4% per year between 1993–94 and 2003–04. Changes in constant price expenditure can reflect the combined effects of changes in the number of health services used and in the nature and cost of those services.

Table 6.4: Health expenditure per person, current and constant price terms[(a)], and annual growth rates, 1993–94 to 2003–04

	Amount ($)		Growth (%)	
Year	**Current**	**Constant**	**Current**	**Constant**
1993–94	2,082	2,708	. .	. .
1994–95	2,183	2,782	4.9	2.7
1995–96	2,313	2,863	5.9	2.9
1996–97	2,459	2,972	6.3	3.8
1997–98	2,594	3,041	5.5	2.3
1998–99	2,733	3,130	5.4	2.9
1999–00	2,901	3,248	6.2	3.8
2000–01	3,196	3,451	10.2	6.2
2001–02	3,418	3,559	7.0	3.1
2002–03	3,667	3,667	7.3	3.0
2003–04[(b)]	3,931	3,785	7.2	3.2
Average annual growth rates				
1993–94 to 1997–98			*5.6*	*2.9*
1997–98 to 2002–03			*7.2*	*3.8*
1993–94 to 2003–04			**6.6**	**3.4**

(a) See Box 6.2 for explanation of constant price estimation.

(b) Based on preliminary AIHW and ABS estimates.

Source: AIHW Health Expenditure Database.

In the four years from 2000–01 to 2003–04, estimated per person expenditure on health grew at an average of 3.1% per year. Five jurisdictions—Northern Territory (5.4%), Australian Capital Territory (4.8%), Victoria (4.2%), South Australia (4.1%) and New South Wales (3.6%)—all had annual growth rates that were higher than the national average. The growth rates in three jurisdictions—Western Australia (3.1%), Tasmania (1.8%) and Queensland (0.3%)—were either equal to or below the national average (Table 6.5).

Table 6.5: Average health expenditure per person, constant price terms[(a)], 2000–01 to 2003–04 ($)

State/territory	2000–01	2001–02	2002–03	2003–04	Average annual growth rates (%)
NSW	3,414	3,525	3,648	3,795	3.6
Vic	3,522	3,736	3,902	3,989	4.2
Qld	3,528	3,475	3,453	3,562	0.3
WA	3,217	3,293	3,429	3,530	3.1
SA	3,440	3,532	3,742	3,882	4.1
Tas	3,395	3,792	3,500	3,585	1.8
ACT	3,623	3,785	3,962	4,173	4.8
NT	3,761	3,808	4,264	4,402	5.4
Australia	**3,451**	**3,559**	**3,667**	**3,785**	**3.1**

(a) See Box 6.2 for explanation of constant price estimation.

Source: AIHW Health Expenditure Database.

Expenditure on health for Aboriginal and Torres Strait Islander Peoples

Estimates of expenditure on health for Aboriginal and Torres Strait Islander Peoples are undertaken at three-yearly intervals. The latest in the series relates to the year 2001–02 (AIHW 2005a). The discussion below focuses on recurrent expenditures only.

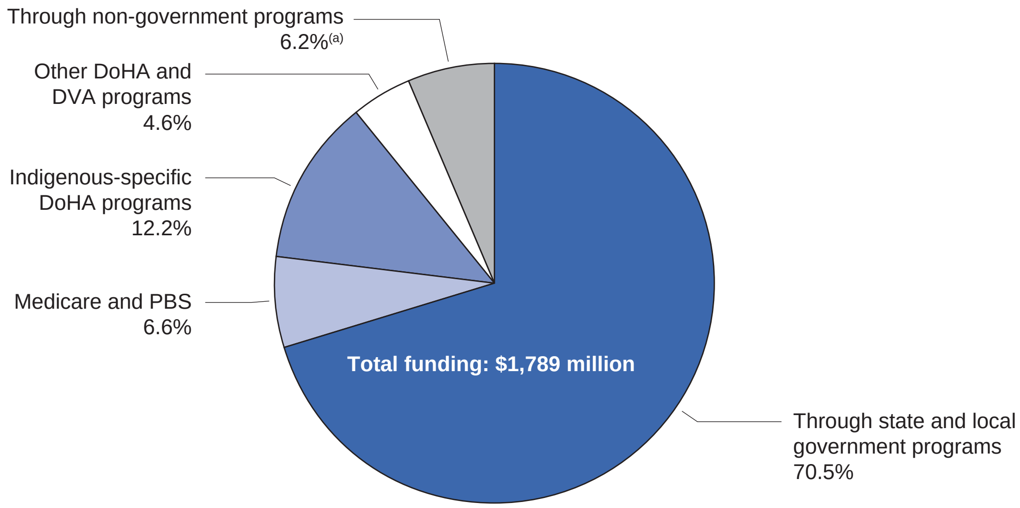
Despite the much poorer health status of Australia's Indigenous population, as reflected in numerous health indicators, average per person expenditure on health goods and services for them in 2001–02 was just 18% higher than for the rest of the Australian population.

Expenditure on health for Indigenous people was estimated at $1,789 million or 2.8% of total recurrent health expenditure across the entire population. That translates into an average of $3,901 per Indigenous person, compared with an average of $3,308 for other Australians (Table S41; AIHW 2005a).

There were substantial differences between the patterns of expenditure on Aboriginal and Torres Strait Islander peoples' health and the expenditures on non-Indigenous people's health. For Indigenous peoples, there was relatively heavy emphasis on the kinds of health services for which states and territories are primarily responsible (such as admitted patient services in public hospitals and community health services). On a per person basis, the ratio of Indigenous to non-Indigenous expenditures for state and territory services was 2.4:1. Most of the expenditure on public hospital services is incurred by state and territory governments (and these are treated as state and territory services in the tables of expenditure ratios); but, as discussed earlier, a substantial share of the funding for such services is provided by the Australian Government.

For the other two major Australian Government funding programs, namely the Medicare Benefits Scheme (MBS) and the PBS, average expenditure per person on Aboriginal and Torres Strait Islander peoples was around one-third of the per person expenditure on other Australians. If spending on Indigenous-specific Australian Government programs (essentially grants to Aboriginal Community Controlled Health Services) and other nationwide Australian Government health services is included, the overall Indigenous/non-Indigenous expenditure ratio for Australian Government programs in 2001–02 was still just 0.86:1.

Average expenditure on private services (that is, neither Australian Government nor state/territory services) provided to Aboriginal and Torres Strait Islander Peoples, such as private hospital and dental services and services provided by other heath professionals, was also much lower than for other Australians. The Indigenous/non-Indigenous expenditure ratio for all non-government health goods and services combined was estimated at 0.23:1.



DoHA Australian Government Department of Health and Ageing.

DVA Australian Government Department of Veterans' Affairs.

(a) Excludes co-payments under the Medicare Benefits Scheme and the Pharmaceutical Benefits Scheme.

Source: AIHW Health Expenditure Database.

Figure 6.1: Expenditure on health for Aboriginal and Torres Strait Islander peoples, 2001–02

Expenditure on health services for veterans

Expenditure by the Department of Veterans' Affairs (DVA) on health in 2004–05 totalled $4,116 million. This expenditure related largely to services for veterans, war widows and widowers with gold or white DVA cards (Table 6.6). The largest expenditures were on hospitals, residential aged care subsidies, and on local medical officers (GPs who are registered with DVA) and specialists. Note that elsewhere in this chapter, DVA expenditure is included in expenditure of the Australian Government but not separately identified.

Table 6.6: Department of Veterans' Affairs health expenditure[a], 2004–05

Type of health service	$ million
Public and private hospitals	1,643
Local medical officers and specialists	687
Residential aged care subsidy	750
Pharmaceuticals	472
Allied health	119
Rehabilitation appliances	85
Dental services	73
Community nursing	73
Veterans' Home Care	80
Travel for treatment	94
Other	40
Total	**4,116**

(a) Actual expense for 2004–05. Excludes the Military Compensation and Rehabilitation Scheme and Military Rehabilitation and Compensation Scheme.

Note: Components do not add to totals due to rounding.

Source: DVA unpublished data.

DVA health expenditure on eligible gold card holders rose from an average of $5,800 per card holder in 1996–97 to an estimated $12,400 in 2004–05 (Table 6.7).

Table 6.7: Department of Veterans' Affairs health expenditure, aggregate and per eligible gold and white card holder[a], 1996–97 to 2004-05

Year	DVA-administered health expenditure ($ million)	Eligible veteran population[b] at 30 June (number)	Expenditure per gold and white card holder ($)
1996–97	1,600	340,327	5,800
1997–98	1,800	339,310	6,600
1998–99	2,000	353,840	6,900
1999–00	2,300	348,996	7,600
2000–01	2,500	345,131	8,400
2001–02	2,700	340,716	9,350
2002–03	3,000	335,160	10,250
2003–04	3,200	325,798	11,450
2004–05	3,400	316,333	12,400

(a) Excludes residential aged care subsidy, salaries and administration and certain minor items not directly related to veteran health care (e.g. health research).

(b) Includes gold and white cardholders.

Sources: DVA annual reports; DVA unpublished data.

How much was spent on each kind of health service?

In 2003–04, recurrent expenditure on health was estimated at $75,804 million (96.4% of total health expenditure). The largest component was expenditure on hospital services, totalling $26,413 million (34.8% of recurrent expenditure); this was made up of spending on public non-psychiatric hospitals ($19,820 million), public psychiatric hospitals ($534 million) and private hospitals ($6,059 million) (Tables S38, S42).

Spending on medical services of $12,961 million (17.1% of recurrent health expenditure) and pharmaceuticals (not including those dispensed in hospitals) of $10,935 million (14.4%) were the next largest components. Expenditures on high-level residential care and on dental services accounted for 6.6% and 6.2%, respectively. A further $3,378 million (4.5% of total recurrent expenditure) was spent on services provided by other health professionals, such as nurses, physiotherapists, psychologists, podiatrists, chiropractors and acupuncturists.

Expenditure on hospitals

Expenditure on hospital services (public and private combined) accounted for 34.8% of recurrent health expenditure in 2003–04, marginally lower than in 2002–03 (35.1%) (Table S42).

The fall between 1993–94 and 2003–04 was largely related to the public hospital systems of the states and territories. In 1993–94, 30.1% of all recurrent expenditure on health was for public hospitals (psychiatric plus non-psychiatric). This fell to 27.1% by 2002–03 and to 26.8% by 2003–04. Estimated expenditure on private hospitals, on the other hand, which had accounted for 7.4% of recurrent health expenditure in 1993–94, had risen to 8.0% in 2003–04.

Expenditure on public non-psychiatric hospitals represented 75.0% of all expenditure on hospitals during 2003–04 (Table S38). These hospitals are funded jointly by the state and territory governments and the Australian Government through a series of five-year Australian Health Care Agreements (AHCAs).

Private hospitals accounted for 23.0% of hospital expenditure in 2003–04, and public psychiatric hospitals for the remaining 2.0% (Table S38).

Expenditure on medical services

The following discussion relates mainly to services provided by private medical practitioners operating on a fee-for-service basis; most such services attract benefits under Medicare. Included are medical services provided to private patients in hospitals. But excluded is the 'medical' component of care provided to public patients in public hospitals (which is treated as expenditure on hospitals).

The estimates of expenditure on medical services also include expenditures under some Australian Government programs, such as those encouraging the supply of medical practitioners in regions where there is a shortage.

Expenditure on medical services showed an average real growth of 3.4% per year between 1993–94 and 2003–04 (Table S39) and, by 2003–04, had reached $12,961 million (Table S38).

Expenditure on pharmaceuticals

The expenditure on pharmaceuticals that is reported separately in the Australian health expenditure accounts (and in most of the discussion below) relates to pharmaceuticals sold through pharmacies, supermarkets, and so on. Expenditure on drugs used in the care of patients admitted to hospitals is treated as a part of the expenditure on hospitals.

Pharmaceutical expenditure increased consistently as a component of recurrent expenditure through the 1990s and the early 2000s. In 1993–94, expenditure on pharmaceuticals sold in pharmacies, supermarkets and other retail outlets represented 11.0% of recurrent expenditure; this had risen to 14.4% by 2003–04 (Table S42).

Estimated expenditure on non-hospital pharmaceuticals (by far the larger component of the total) was $10,935 million in 2003–04. This comprised $6,665 million on benefit-paid pharmaceuticals and $4,270 million on other non-hospital pharmaceuticals (Table 6.8).

Table 6.8: Expenditure on pharmaceuticals[(a)], current price terms, 2003–04 ($ million)

	Benefit-paid pharmaceuticals	All other pharmaceuticals		Total pharmaceuticals
		Non-hospital	Hospital	
Public sector				
Australian Government Department of Veterans' Affairs	460	. .	. .	460
Australian Government Department of Health and Ageing[(b)(c)]	5,168	62	. .	5,230
Public acute care and psychiatric hospitals[(d)]	. .	. .	1,371	1,371
Total public sector	*5,628*	*62*	*1,371*	*7,061*
Private sector				
Health insurance funds	. .	49	. .	49
Individuals	1,037	4,055	. .	5,091
Private hospitals[(e)]	. .	. .	271	271
Other non-government	. .	104	. .	104
Total private sector	*1,037*	*4,208*	*271*	*5,515*
Total[(b)]	**6,665**	**4,270**	**1,642**	**12,576**

(a) Excludes complementary and alternative medicines.

(b) Excludes $406 million in payments for highly specialised drugs.

(c) Includes $158 million in Section 100 payments for human growth hormones, IVF and other subsidised pharmaceuticals.

(d) Includes $345 million in Australian Government payments to states for highly specialised drugs.

(e) Includes $61 million in Australian Government payments for highly specialised drugs.

Note: Components may not add to totals, due to rounding.

Source: AIHW Health Expenditure Database.

Total expenditure on all pharmaceuticals (including in-hospital drug purchases) in 2003–04 was estimated at $12,576 million; this included $1,642 million of drugs used by hospitals in the provision of hospital services. The estimated expenditure on in-hospital drugs was made up of $1,371 million expenditure on drugs by public hospitals and $271 million by private hospitals. This estimate of total pharmaceutical expenditure does not include expenditures incurred by the Australian Government and state and territory governments in purchasing and administering vaccines under various state, territory and national public health programs.

Expenditure on benefit-paid items under the PBS and the Repatriation Pharmaceutical Benefits Scheme (RPBS) represented more than half the total expenditure on pharmaceuticals. Expenditure on benefit-paid items has two components—cost to government and co-payments by users.

The cost to government under the PBS (not including expenditure under the RPBS) in 2003–04 was estimated at $4,992 million. In 2004–05, it increased to $5,296 million (Table 6.9). The relative funding shares of the PBS (that met by the Australian Government through benefits and that met by individuals through their co-payments) have changed only marginally in recent years. In 2000–01, the government share of the PBS was 83.7%; it rose to 83.9% in 2001–02 and to 84.2% in 2002–03 and 2003–04, and fell to 83.6% in 2004–05.

Table 6.9: Pharmaceutical Benefits Scheme[(a)], Australian Government and patients' payments, 2000–01 to 2004–05 ($ million)

Benefit category	2000–01	2001–02	2002–03	2003–04	2004–05
Patient contributions					
General patients	407	444	489	545	597
Concessional patients	337	362	370	393	444
Total patient contributions	*744*	*806*	*860*	*938*	*1,041*
Government benefits					
General patients–no safety net	662	691	751	824	851
General patients–safety net	128	148	170	191	223
Total general patients	*790*	*840*	*920*	*1,015*	*1,073*
Concessional patients–no safety net	2,360	2,570	2,747	2,972	3,077
Concessional patients–safety net	660	778	908	1,005	1,145
Total concessional patients	*3,020*	*3,348*	*3,655*	*3,977*	*4,223*
Total cost to government	*3,810*	*4,188*	*4,575*	*4,992*	*5,296*
Total cost of PBS benefit-paid items[(b)]	4,554	4,994	5,435	5,929	6,337

(a) Does not include Repatriation Pharmaceutical Benefits Scheme or 'doctors bag' pharmaceuticals.

(b) Excludes Section 100 payments for human growth hormones, IVF and other non-PBS subsidised pharmaceuticals.

Note: Components may not add to totals, due to rounding.

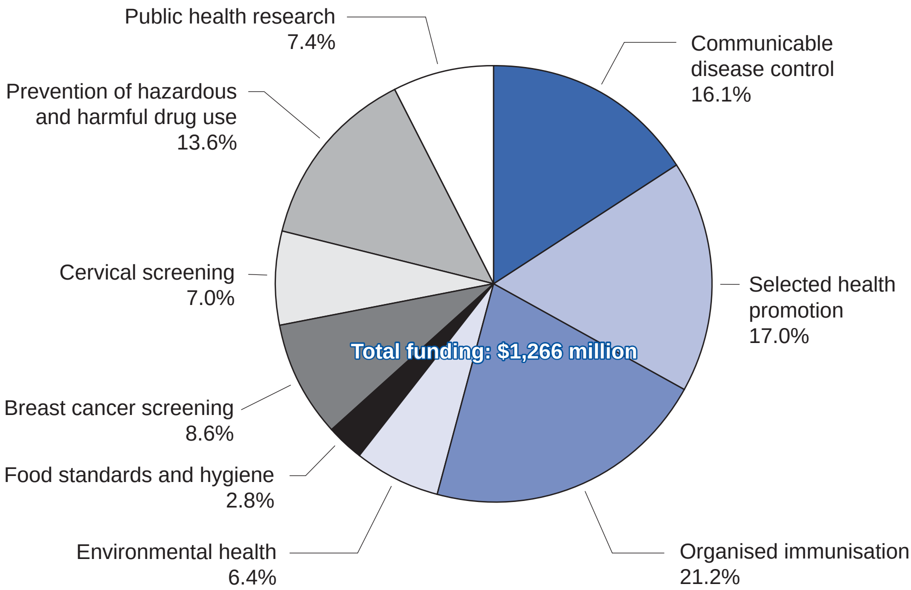
Source: DoHA unpublished data.

Expenditure on public health activities

Estimates of expenditures on public health activities are presented in a series of publications flowing from the National Public Health Expenditure Project (AIHW 2001, 2002, 2004, 2006). The bulk of expenditure on public health is incurred and funded by governments; the estimates discussed here do not cover the relatively small amounts for the non-government sector.

In 2003–04, governments in Australia, through programs administered by their health departments, incurred a total of $1,266 million expenditure on public health activities (Table S44); this represented 1.7% of total recurrent expenditure on health (Table S42).

Expenditure on organised immunisation accounted for $268.0 million (or 21.2% of all government expenditure on public health activities) during 2003–04 and was the largest single area of expenditure (Table S44; Figure 6.2). Selected health promotion activities accounted for a further $214.6 million (17.0%) and communicable disease control $203.9 million (16.1%). Activities directed at the prevention of hazardous and harmful drug use was another important area of expenditure, accounting for $171.6 million (or 13.6% of public health expenditure).



Source: AIHW 2006b.

Figure 6.2: Government expenditure on public health activities, 2003–04

How much was spent on capital?

The roles of the various sectors in funding capital expenditure (sometimes called 'capital formation') are quite diverse. For example, the Australian Government largely funds capital expenditure through grants and subsidies to other levels of government and to non-government organisations, to enable them to provide facilities for health service delivery. State and territory governments, on the other hand, themselves acquire and control large capital assets such as hospitals, community health centres and residential aged care facilities. Most non-government investment relates to private hospitals and residential care facilities, and relies on a combination of funding from the private sector and from governments.

Total capital expenditure in 2003–04 was estimated at $1,673 million (Table S38). Almost three-quarters of this (72.6%) was funded by state, territory and local governments from their own funding sources. Non-government sources and the Australian Government provided 18.4% and 9.0%, respectively (Table 6.10).

The long-term nature and 'lumpiness' of capital investments means that trend analysis, even over a period as long as a decade, is not meaningful for most purposes.

Table 6.10: Shares of outlays on health capital, current price terms, 1993–94 to 2003–04 (per cent)

	Government				
Year	Australian Government	State/territory and local	Total	Non-government	Total
1993–94	5.3	48.5	53.9	46.1	100.0
1994–95	0.5	54.6	55.1	44.9	100.0
1995–96	4.4	49.6	54.0	46.0	100.0
1996–97	2.7	52.1	54.8	45.2	100.0
1997–98	2.6	57.0	59.7	40.3	100.0
1998–99	8.2	46.9	55.1	44.9	100.0
1999–00	1.4	54.6	56.0	44.0	100.0
2000–01	5.0	61.7	66.7	33.3	100.0
2001–02	8.2	69.0	77.2	22.8	100.0
2002–03	8.9	72.5	81.3	18.7	100.0
2003–04[a]	9.0	72.6	81.6	18.4	100.0

(a) Based on preliminary AIHW and ABS estimates.

Note: Components may not add to totals, due to rounding.

Source: AIHW Health Expenditure Database.

Comparisons with other OECD countries

This section compares Australia's health expenditure with that in other OECD member countries. The comparison does not provide an assessment of the relative efficiencies of the health systems; nor does it look at spending needs or health status.

The international comparisons use a slightly different definition of health expenditure from that in the rest of the chapter. This is because, for domestic reporting, Australia uses the concept of health expenditure that was adopted by the World Health Organization (WHO) in the 1970s and which formed the basis for international comparisons for several decades afterwards. Recently, however, the OECD and WHO have adopted the OECD's International Classification of Health Accounts as the basis for international reporting of health expenditure. The major difference is the exclusion of expenditures on:

- research and development
- food standards and hygiene
- environmental health.

It is not possible to adjust the other countries' total health expenditure estimates to conform with Australian definitions. Therefore, the estimates of total health expenditure for Australia that are presented here differ somewhat from those used elsewhere in this report. The amounts involved are not large.

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, while comparative reporting of health expenditures is becoming more and more meaningful, readers are urged to exercise caution in drawing conclusions from these comparisons.

One commonly used measure of the relative sizes of health systems in different countries is the 'health expenditure-to-GDP ratio'. The average (weighted) ratio for OECD countries was 11.6% in 2003 (Table 6.11). This comparison is influenced by the

Table 6.11: International comparison of health expenditure[(a)], OECD countries, 1993, 1998 and 2003

	1993		1998		2003	
Country	Health to GDP (%)	Per person (A$)	Health to GDP (%)	Per person (A$)	Health to GDP (%)	Per person (A$)
Australia	**8.2**	**2,052**	**8.6**	**2,695**	**9.5**	**3,855**
Austria	7.8	2,236	7.6	2,558	7.5	3,108
Belgium	8.1	2,145	8.5	2,627	9.6	3,816
Canada	9.9	2,699	9.2	3,009	9.9	4,054
Czech Republic	6.7	1,018	6.6	1,187	7.5	1,752
Denmark	8.8	2,362	8.4	2,801	9.0	3,730
Finland	8.3	1,916	6.9	2,101	7.4	2,859
France	9.4	2,517	9.3	2,928	10.1	3,919
Germany	9.9	2,664	10.6	3,253	11.1	4,045
Greece	8.8	1,443	9.4	1,801	9.9	2,715
Hungary	7.7	855	7.3	1,014	8.4	1,713
Iceland	8.4	2,338	8.7	2,987	10.5	4,205
Ireland	7.0	1,392	6.2	1,941	7.4	3,309
Italy	8.0	2,049	7.7	2,363	8.4	3,048
Japan	6.5	1,829	7.2	2,283	n.a.	n.a.
Korea	4.3	607	4.5	807	5.6	1,450
Luxembourg	6.2	2,534	5.8	3,010	6.9	5,002
Mexico	5.8	532	5.4	559	6.2	787
Netherlands	8.6	2,279	8.2	2,678	9.8	4,018
New Zealand	7.2	1,494	7.8	1,898	8.1	2,546
Norway	8.0	2,271	8.5	3,030	10.3	5,139
Poland	5.9	507	6.0	727	6.5	1,004
Portugal	7.3	1,181	8.4	1,699	9.6	2,426
Slovak Republic	n.a.	n.a.	5.7	732	5.9	1,049
Spain	7.5	1,459	7.5	1,776	7.7	2,477
Sweden	8.6	2,203	8.3	2,568	9.4	3,649
Switzerland	9.4	3,217	10.3	3,904	11.5	5,104
Turkey	3.7	268	4.8	409	7.4	693
United Kingdom	6.9	1,651	6.9	2,066	n.a.	n.a.
United States	13.2	4,498	13.0	5,368	15.0	7,607
Average (unweighted) (27 countries)[(b)]	**7.9**	**1,879**	**7.9**	**2,285**	**8.9**	**3,260**
Average (weighted) (27 countries)[(b)(c)]	**10.3**	**2,409**	**10.3**	**2,886**	**11.6**	**4,035**

(a) Estimated health expenditure according to the International Classification of Health Accounts excludes expenditure on health research.

(b) Excludes the Slovak Republic, Japan and the United Kingdom.

(c) Averages weighted by GDP or population.

Note: Expenditures converted to Australian dollar values using GDP purchasing power parities.

Sources: AIHW Health Expenditure Database; OECD 2005.

exclusion of the United Kingdom and Japan, neither of whom had provided expenditure estimates for 2003. The United Kingdom and Japan are both relatively large economies with lower than average health expenditure-to-GDP ratios in most years. For Table 6.11, both Japan and the United Kingdom have been excluded from the calculation of averages, as has the Slovak Republic, which joined the OECD after the beginning of the period being discussed. Australia's ratio (8.2% in 1993, 8.6% in 1998 and 9.5% in 2003) was consistently below the OECD weighted average. The United States had by far the highest ratio, spending 15.0% of GDP on health in 2003.

Table 6.11 also shows health expenditures per person. These figures were calculated after adjusting for differences in the purchasing powers of national currencies, based on broad GDP purchasing power parities. Throughout the period, Australia's per person expenditure on health was below the OECD weighted average. By 2003, Australia's per person expenditure had risen to $3,855 which was similar to the amount spent in France, Belgium, Denmark and Sweden. The United States had the highest per person expenditure on health ($7,607 in 2003).

Health funding

The Australian Government and state and territory governments provide large amounts of funding for health. Local governments also finance certain health services from their own revenues or from general-purpose funds provided by state governments. But it is often difficult to distinguish funding provided by local governments themselves from that provided to them by state governments. Hence, for much of the following discussion, funding for those two levels of government has been combined.

Between 1993–94 and 2003–04, the contribution of governments to the funding of health expenditure rose from 66.4% to 68.0% (Table 6.12).

Influence of health service funding agreements

Government funding for public hospitals and some related state-provided health services has been governed by a series of five-year agreements between the Australian Government and each of the states and territories (Box 6.3). These have had an important influence on both the overall level of expenditure on health in Australia and on funding contributions. The discussion below focuses on impacts during the latest two periods.

Box 6.3: Australian Government/state government health funding agreement periods

First Medicare (Compensation) Agreement: 1984 to June 1988

Second Medicare Agreement: 1 July 1988 to 30 June 1993

Third Medicare Agreement: 1 July 1993 to 30 June 1998

First Australian Health Care Agreement: 1 July 1998 to 30 June 2003

Second Australian Health Care Agreement: 1 July 2003 to 30 June 2008

In the first year covered by each set of agreements, the Australian Government's share of funding has tended to rise somewhat but then fall over the remainder of the agreement period. Counterbalancing falls and rises are observed in the state and territory shares.

This general tendency was not observed so clearly in the AHCA period 1998–2003, primarily because of the Australian Government's 30% health insurance premium rebates, which acted to maintain its share of funding. Thus, in the fourth and fifth years of the first AHCA period, the Australian Government's share of funding for total health expenditure was marginally higher than in the first year. In 2003–04, the first year of the second AHCA period, the Australian Government share of the total fell to 45.5% (Table 6.12).

Table 6.12: Government and non-government expenditure as a proportion of total health expenditure, 1993–94 to 2003–04, current price terms (per cent)

	Government			Non-government				
Year	Australian Government[a]	State/ territory and local	Total	Health insurance funds	Individuals[a]	Other	Total	Total
1993–94	45.1	21.3	66.4	11.0	17.0	5.7	33.6	100.0
1994–95	44.8	21.6	66.3	10.7	17.1	5.9	33.7	100.0
1995–96	45.2	22.0	67.2	10.5	16.0	6.3	32.8	100.0
1996–97	43.7	22.9	66.7	10.4	16.6	6.3	33.3	100.0
1997–98	44.4	23.8	68.2	8.8	16.6	6.3	31.8	100.0
1998–99	46.1	21.9	68.0	7.5	18.1	6.4	32.0	100.0
1999–00	47.1	22.9	70.1	6.5	17.2	6.2	29.9	100.0
2000–01	46.8	22.7	69.4	6.7	18.6	5.3	30.6	100.0
2001–02	46.2	22.2	68.4	7.5	19.3	4.9	31.6	100.0
2002–03	46.2	22.6	68.8	7.3	19.6	4.3	31.2	100.0
2003–04[b]	45.5	22.6	68.0	7.1	20.3	4.6	32.0	100.0

(a) Australian Government and individuals' expenditures have been adjusted for tax expenditures (Table S36).

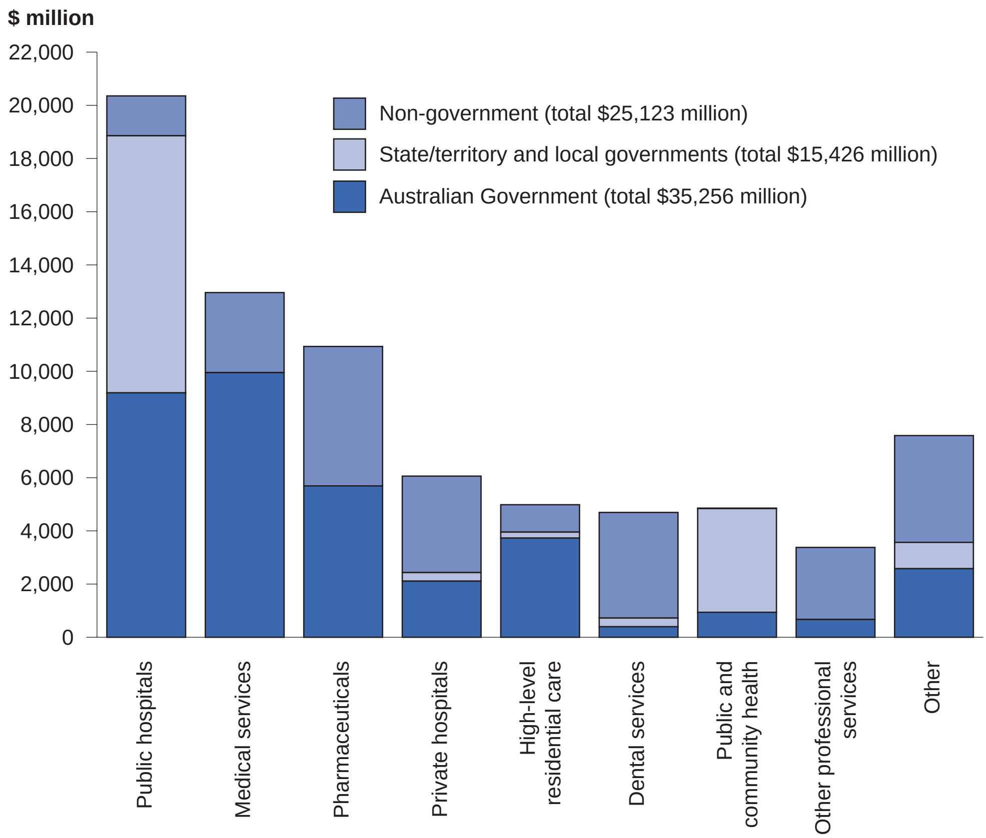
(b) Based on preliminary AIHW and ABS estimates.

Note: Components may not add to totals, due to rounding.

Source: AIHW Health Expenditure Database.

Who funds spending on each kind of health service?

The relative contributions of the major funding sources vary according to the type of health service being funded. The Australian Government is the major source of funds for high-level residential care (74.8%), medical services (76.8%) and health research (66.6%). State and territory governments are the major source of funding for community health services (91.9%). Funding for public hospitals is shared between the Australian Government (45.2%) and the states and territories (47.5%), as is funding for public health activities (52.4% and 47.6% respectively), while for pharmaceuticals it is shared between the Australian Government (52.0%) and non-government sources (48.0%). Private hospitals are largely funded by non-government sources (59.9%) (Figure 6.3; Table S38).



Source: AIHW Health Expenditure Database.

Figure 6.3: Recurrent health expenditure, by health services area and source of funds, current price terms, 2003-04

Funding of hospital services

This section describes changes in the funding for hospitals over the two AHCA periods (to the end of June 2004—the latest period for which comprehensive data are available). Funding by the Australian Government includes some funding provided outside the AHCAs (for example, it includes funding by DVA for services provided to veterans and their dependants). While the funding covered by the AHCAs relates mostly to public non-psychiatric hospitals, it also affects expenditure on other types of hospitals. Therefore, the following discussion covers funding of all hospitals.

It is important to note that there is a break in the funding sources time series after 2001–02, which relates to funding sources for private hospitals. From 2002–03, state and territory governments began identifying their purchases of services from private hospitals as part of their funding for private hospitals. This change in practice resulted in a substantial change in the estimated state/territory share of hospital funding from

34.9% in 2001–02 to 37.3% in 2002–03 and a corresponding drop in the non-government share of funding (Table 6.13).

Table 6.13: Shares of recurrent expenditure on hospitals, current price terms, 1993–94 to 2003–04 (per cent)

	Government				
Year	Australian Government	State/territory and local	Total	Non-government	Total
1993–94	40.5	33.4	73.8	26.2	100.0
1994–95	39.4	34.3	73.7	26.3	100.0
1995–96	37.7	35.7	73.4	26.6	100.0
1996–97	36.5	37.2	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	34.8	79.8	20.2	100.0
2001–02	43.8	34.9	78.8	21.2	100.0
2002–03	43.4	37.3	80.7	19.3	100.0
2003–04[(a)]	42.8	37.8	80.6	19.4	100.0

(a) Based on preliminary AIHW and ABS estimates.

Note: Components may not add to totals, due to rounding.

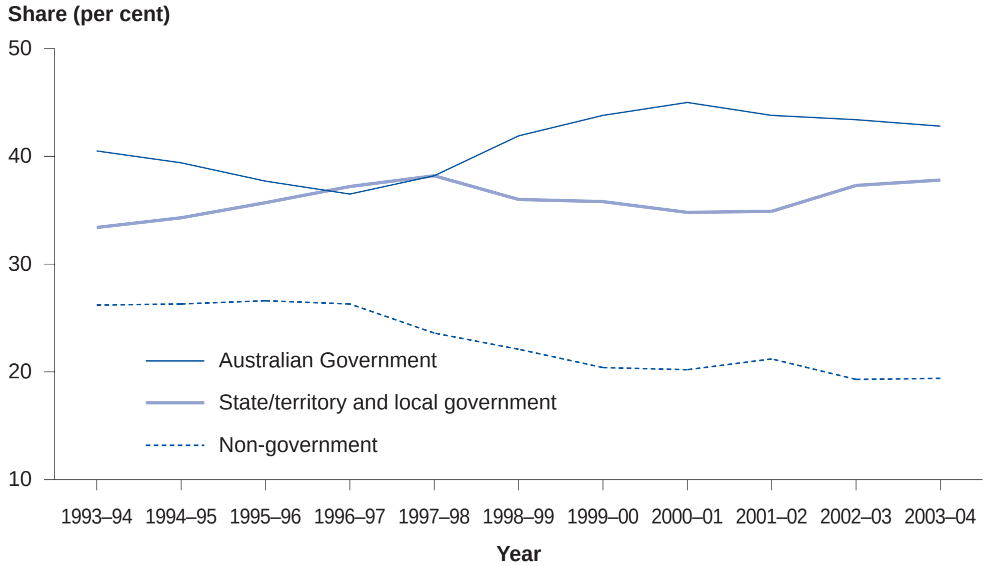
Source: AIHW Health Expenditure Database.

Up to 1996, funding—in particular, the shares provided by the different levels of government—had displayed similar patterns throughout each funding agreement period. In the first year covered by a set of agreements, there was a noticeable increase in the share met by the Australian Government and a corresponding fall in the state/territory share. This was followed by several years of falls in the Australian Government share, and rises in the state/territory shares (Figure 6.4). This pattern continued into the first few years of the 1993–1998 AHCA period.

In 1997–98, the Australian Government's share of funding for hospitals rose substantially, from 36.5% in the previous year to 38.2% (Table 6.13). This was largely due to Australian Government policy measures aimed at arresting a long-term decline in membership of private health insurance—the Private Health Insurance Incentives Scheme (PHIIS) was introduced in 1997, and it was replaced by a 30% rebate on premiums in January 1999.

The subsidy and the 30% rebate have both been treated in the expenditure estimates as funding by the Australian Government. This reduces the estimated share of funding by private health insurance funds—this is reflected in the drop in the overall non-government share of funding from 26.3% in 1996–97 to 23.6% in 1997–98.

The Australian Government maintained its higher share of overall hospital funding throughout the 1998–2003 AHCA period. This was largely due to changes in the private health insurance arrangements, and was mostly seen through the funding of private hospitals.



Source: AIHW Health Expenditure Database.

Figure 6.4: Shares of recurrent expenditure on hospitals, current price terms, 1993–94 to 2003–04

Funding of medical services

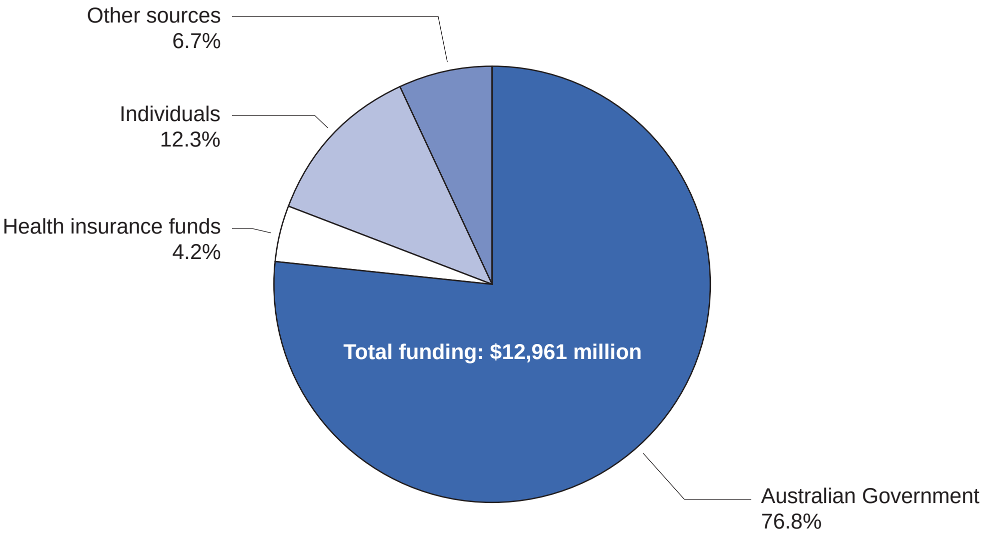
Most Australian Government funding for medical services was through Medicare benefits (Figure 6.5). The Australian Government also funded medical services for veterans and their dependants through the DVA.

Direct expenditure on medical services (apart from services delivered to public patients within hospitals) by state, territory and local governments is negligible.

Most of the non-government funding for medical services (estimated at $3,010 million in 2003–04) was in the form of co-payments by individuals for services provided under Medicare. It also includes benefits paid by health insurance funds for services provided in hospitals and payments by other non-government sources (mostly workers compensation and compulsory motor vehicle third party insurers).

Between 1993–94 and 2000–01 there was very little shift in the Australian Government's share of funding for medical services (Table 6.14). The small change during that period (from 82.8% to 81.5%) was reflected in rises in the shares of funding coming from both individuals (up from 9.9% to 10.6%) and other non-government sources (up from 4.3% to 5.2%).

After 2000–01, there were some substantial falls in the Australian Government's share of funding for medical services. In 2001–02 the share was 79.9%, compared with 81.5% in the previous year, reflecting a rise in the share being met by private health insurance funds (from 2.8% to 3.7%).



Source: Table S38.

Figure 6.5: Shares of recurrent expenditure on medical services, current price terms, by source of funds, 2003–04

Table 6.14: Shares of recurrent funding for medical services, current price terms, and proportion of medical services bulk-billed, 1993–94 to 2003–04 (per cent)

		Non-government					
Year	Australian Government	Private health insurance funds	Individuals	Other	Total	Total	Bulk-billing rate
1993–94	82.8	3.0	9.9	4.3	17.2	100.0	68.1
1994–95	82.4	2.9	9.6	5.0	17.6	100.0	69.6
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	5.4	17.9	100.0	72.3
2000–01	81.5	2.8	10.6	5.2	18.5	100.0	71.4
2001–02	79.9	3.7	10.7	5.7	20.1	100.0	70.4
2002–03	78.4	4.1	11.9	5.6	21.6	100.0	67.8
2003–04[(a)]	76.8	4.2	12.3	6.7	23.2	100.0	67.5

(a) Based on preliminary AIHW and ABS estimates.

Source: AIHW Health Expenditure Database.

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. For example, if the quantity, prices and mix of services remained constant, while the proportion of services that were bulk-billed rose, the average co-payment across all medical services would fall, while the average payment by the Australian Government would remain constant. This, in turn, would bring about a fall in the share of the overall expenditure being funded by individuals and a corresponding rise in the Australian Government's share.

In 1993–94, 68.1% of all medical services were bulk-billed; by 1999–00, this had risen to 72.3%. After 1999–00, the overall bulk-billing rate declined each year to 2003–04, when 67.5% of all medical services were bulk-billed.

Funding of pharmaceuticals

The Australian Government contributed $5,628 million in funding for pharmaceuticals under the PBS and the RPBS. Individual patients paid $1,037 million in co-payments under these schemes and an estimated $4,055 million by way of payments for non-benefit pharmaceuticals (Table 6.8).

Funding of public health activities

While most public health spending was incurred by state and territory health governments, a substantial proportion was funded by the Australian Government through public health grants to the states and territories.

In 2003–04, state and territory governments incurred an estimated $919.8 million of the $1,266 million spent nationally by governments on public health activities. Of this, $311.3 million was funded by the Australian Government through grants to the states and territories. In addition, the Australian Government spent $346.2 million directly on public health programs for which it was responsible (Table S44).

How much funding comes from government and non-government sources?

Funding by the Australian Government

In 2003–04, more than half of the Australian Government's recurrent health funding was directed to two health services—medical services (28.2% of the total) and public non-psychiatric hospitals (26.1%) (calculated from Table S38). Pharmaceuticals (16.1%) and high-level residential care (10.6%) were also major expenditures funded by the Australian Government.

The Australian Government's Medicare Levy (Box 6.4) raised $5.6 billion in 2003–04. This was equivalent to 15.6% of the estimated total health funding by the Australian Government (higher than the corresponding share in 2002–03, but lower than in its first full year of operation, 1984–85, when it was 16.3%) (Table S35).

Box 6.4: 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.

This levy was introduced in 1984 and was originally set at 1.0% of taxable earnings. It has been 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 without private insurance cover for hospital care.

Since 2003, the Australian Government has provided funding in support of medical indemnity (Box 6.5).

Box 6.5: Australian Government funding of medical indemnity

Almost all of the expenditure on medical services in Australia is related to services provided by private medical practitioners who operate on a fee-for-service basis.

Since 2003, the Australian Government has provided financial and other support to medical practitioners and their medical defence organisations aimed at ensuring the viability of Australia's medical indemnity insurance market.

The major elements of the Australian Government support package are:

- *the High Cost Claims Scheme, which assists medical indemnity insurers with the costs of claims in excess of $300,000*
- *the Premium Support Scheme, which provides subsidies of 80% for the component of eligible medical practitioners' indemnity costs that exceeds 7.5% of their income*
- *the Run-Off Cover Scheme, which provides a guarantee of medical indemnity cover for eligible doctors who retire or otherwise leave the medical workforce (owing to disability, for example).*

Funding by state/territory and local governments

The bulk of the funding from the remaining two levels of government comes from the state and territory governments. The contribution by local government is some funding of high-level residential aged care homes, and of some public and community health services.

State and territory governments also make health payments to local governments, and these are included in the estimates of funding attributed to the state or territory governments concerned. Likewise, Australian Government payments to the state and territory governments for health are regarded as funding by the Australian Government and are not included as funding by state and territory governments.

Nationally, most funding by state/territory and local governments was directed to services in public hospitals ($9.7 billion or 54.5% of total state/territory and local government health funding for 2003–04). In addition, a large proportion of the capital expenditure that is funded by state/territory and local governments related to public hospital facilities (Table S38).

Funding by non-government sources

Most non-government funding for health goods and services in Australia comes from out-of-pocket payments by individuals. This includes circumstances where individuals meet the full cost of a service or good, as well as where they share the funding of goods and services with third-party payers—for example, private health insurance funds or the Australian Government (say, through Medicare, PBS or RPBS). Funding by individuals accounted for 63.3% ($15.9 billion) of estimated non-government funding of health goods and services during 2003–04 (Table 6.15). That proportion rose 12.9 percentage points in the decade to 2003–04. Private health insurance funds provided 22.3% ($5.6 billion) in 2003–04, down from 32.8% in 1993–94. The remaining 14.4% ($3.6 billion) came from other non-government sources (mainly compulsory motor vehicle, third-party and workers compensation insurers), which experienced a fall in their share of health funding, by 2.4 percentage points, in the decade to 2003–04.

Table 6.15: Non-government funding of total health expenditure, current price terms, by source of funds, 1993–94 to 2003–04

	Private health insurance funds[a]		Individuals[b]		Other non-government[c]		All non-government sources[a][b][c]	
Year	Amount ($m)	Proportion (%)	Amount ($m)	Proportion (%)	Amount ($m)	Proportion (%)	Amount ($m)	Proportion (%)
1993–94	4,075	32.8	6,272	50.4	2,092	16.8	12,440	100.0
1994–95	4,201	31.8	6,702	50.8	2,303	17.4	13,205	100.0
1995–96	4,426	32.0	6,743	48.8	2,649	19.2	13,817	100.0
1996–97	4,700	31.1	7,541	50.0	2,856	18.9	15,096	100.0
1997–98	4,271	27.8	8,037	52.4	3,029	19.7	15,336	100.0
1998–99	3,855	23.4	9,312	56.6	3,290	20.0	16,456	100.0
1999–00	3,601	21.8	9,511	57.5	3,425	20.7	16,538	100.0
2000–01	4,123	21.9	11,463	60.8	3,254	17.3	18,840	100.0
2001–02	4,975	23.6	12,870	61.0	3,262	15.5	21,107	100.0
2002–03	5,268	23.3	14,230	62.9	3,135	13.9	22,632	100.0
2003–04[d]	5,603	22.3	15,922	63.3	3,614	14.4	25,139	100.0

(a) Adjusted for the private health insurance incentives subsidy and the 30% premium rebates claimed through the tax system for years from 1997–98 to 1999–00.

(b) Adjusted for non-specific tax expenditures.

(c) Includes expenditure on capital formation.

(d) Based on preliminary AIHW and ABS estimates.

Note: Components may not add to totals, due to rounding.

Source: AIHW Health Expenditure Database.

Real growth in funding, by sources of funds

Total funding of health grew in constant price terms by an average of 4.6% a year between 1993–94 and 2003–04. Over this period, the state/territory and local governments had the highest growth rate (at an annual average of 5.9%), followed by the Australian Government (5.4%) and the non-government sector (2.8%). The period from 1997–98 to 2002–03, during which the Australian Government's private health insurance incentives were being introduced and revised, saw Australian Government funding grow by an average of 6.3% a year. In that period, overall health expenditure also experienced its highest annual real growth (5.10%). From 2002–03 to 2003–04, however, growth in funding for the non-government sector (up 5.1%) overtook that of the state/territory and local governments (up 4.8%) and the Australian Government (up 3.9%) (Table 6.16).

During the decade 1993–94 to 2003–04, the real growth in funding by state/territory and local governments was generally higher than that of the Australian Government. For example, the funding by state/territory and local governments of public non-psychiatric hospitals experienced a real growth rate of 5.3% over 2002–03 to 2003–04. This was more than double the growth in funding of public non-psychiatric hospitals by the Australian Government (2.0%). Other areas of expenditure for which the state/territory and local governments provide a substantial and rising share of funding were public health activities and community health services; these showed average annual real growth rates of 19.0% and 3.1% respectively.

Table 6.16: Funding of health, constant price terms[a], and annual growth rates, 1993–94 to 2003–04

	Government							
	Australian Government[b]		State/territory and local		Non-government[b]		Total	
Year	Amount ($m)	Growth (%)	Amount ($m)	Growth (%)	Amount ($m)	Growth (%)	Amount ($m)	Growth (%)
1993–94	20,490	. .	9,640	. .	17,982	. .	48,112	. .
1994–95	21,268	3.8	10,175	5.6	18,530	3.0	49,973	3.9
1995–96	22,510	5.8	10,938	7.5	18,641	0.6	52,089	4.2
1996–97	23,125	2.7	12,132	10.9	19,494	4.6	54,752	5.1
1997–98	24,639	6.5	13,173	8.6	18,804	–3.5	56,615	3.4
1998–99	26,599	8.0	12,617	–4.2	19,702	4.8	58,918	4.1
1999–00	28,684	7.8	13,859	9.8	19,313	–2.0	61,857	5.0
2000–01	30,809	7.4	14,813	6.9	20,920	8.3	66,542	7.6
2001–02	31,825	3.3	15,336	3.5	22,345	6.8	69,507	4.5
2002–03	33,467	5.2	16,352	6.6	22,632	1.3	72,452	4.2
2003–04[c]	34,774	3.9	17,134	4.8	23,786	5.1	75,695	4.5
Average annual growth rates								
1993–94 to 1997–98		*4.7*		*8.1*		*1.1*		*4.2*
1997–98 to 2002–03		*6.3*		*4.4*		*3.8*		*5.1*
1993–94 to 2003–04		**5.4**		**5.9**		**2.8**		**4.6**

(a) See Box 6.2 for explanation of constant price estimation.

(b) Adjusted for tax expenditures.

(c) Based on preliminary AIHW and ABS estimates.

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. 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 other benefits to insured people (Box 6.6).

The health benefits paid out by private insurers finance the health expenditures incurred by their members. Since the introduction of the private health insurance subsidy scheme in 1997, the funding for members' health expenditures 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.

Health insurance funds a wide range of health services and, in the discussion that follows, it has been assumed that the funding that comes from net premiums and that which comes from the government rebates are both used in the same proportions in funding those services.

Box 6.6: 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. There are four categories of health insurance membership—singles, couples without children, single parents, and couples with children.

The funds can tailor their insurance products to meet particular needs of contributors. For example, they may offer options that exclude benefits for obstetrics or hip replacements; the premiums for such insurance reflect the exclusions. 'Front-end deductible' tables are also available. These allow contributors to pay a set part of the charge for hospital care from their own pockets while paying a reduced premium.

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 1 July following their thirtieth birthday and maintain their hospital cover pay lower premiums throughout their lives than those who join later in life. People over 30 years old who take out hospital cover pay a loading of 2% for each year that 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 and over at 1 July 1999 are also exempt from premium loading.

Total funding for health services through private health insurance funds (that is, total benefits paid both out of members' net premiums and the Australian Government rebate) in 2003–04 was $8,133 million (Table S50; AIHW 2005b). This was 10.3% of estimated total expenditure on health in that year. Of that, an estimated $2,530 million (31.1%) was funded from the rebates on private health insurance premiums. This was the fourth year that the lifetime cover arrangements had been in operation (Box 6.7; AIHW 2005b).

The net funding of health services (including administration of the health insurance funds) out of the income generated by the funds themselves (that is, not including the amount assumed to be met from the premium rebate) increased from $5,268 million in 2002–03 to $5,603 million in 2003–04 (Table S50).

There was a large increase in fund membership at the beginning of 2000–01. This has been generally attributed to the lifetime health cover arrangements introduced in July 2000 (Box 6.6). The influx of new members, coupled with the statutory waiting periods for eligibility for benefits, meant that net income received by funds during 2000–01 exceeded the net health-related benefits and administrative expenditure by $1.1 billion. Accordingly, the combined operating profits of the funds, before abnormals and extraordinary items, were much higher in 2000–01 ($852 million) than in 1999–00 ($381 million). In 2003–04, health insurance funds had an operating profit, before abnormals and extraordinary items, of $447 million (Table S51). An increase in other revenue—from $194 million in 2002–03 to $296 million in 2003–04—was partly responsible for this.

Box 6.7: Treatment of rebates on private health insurance premiums in the expenditure estimates

When individuals purchase private health insurance cover, they are charged periodic premiums (per month, quarter, year, etc.). These premiums enable the private health insurers to fund health expenditure incurred by their members.

The Private Health Insurance Incentives Act 1997 *introduced a means-tested subsidy 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 that is payable to anyone with private health insurance cover. From April 2005, the rebate for people aged 65 to 69 increased to 35% of the premium, and for people aged 70 and over, it increased to 40% of the premium. The rebates may be claimed as a reduced health insurance premium, as a tax rebate or as a cash reimbursement at a Medicare office. The rebates directly reduce the price of private health insurance cover, and are not directly related to potential liabilities for fund members. But revenues flowing into the funds are maintained at a level considered necessary to meet current and future liabilities.*

The overall premiums charged by funds (including any subsidy or rebate) are based on a community rating principle. The premiums can vary between funds in the light of the actual and potential benefit liabilities of the entire fund, not individual members.

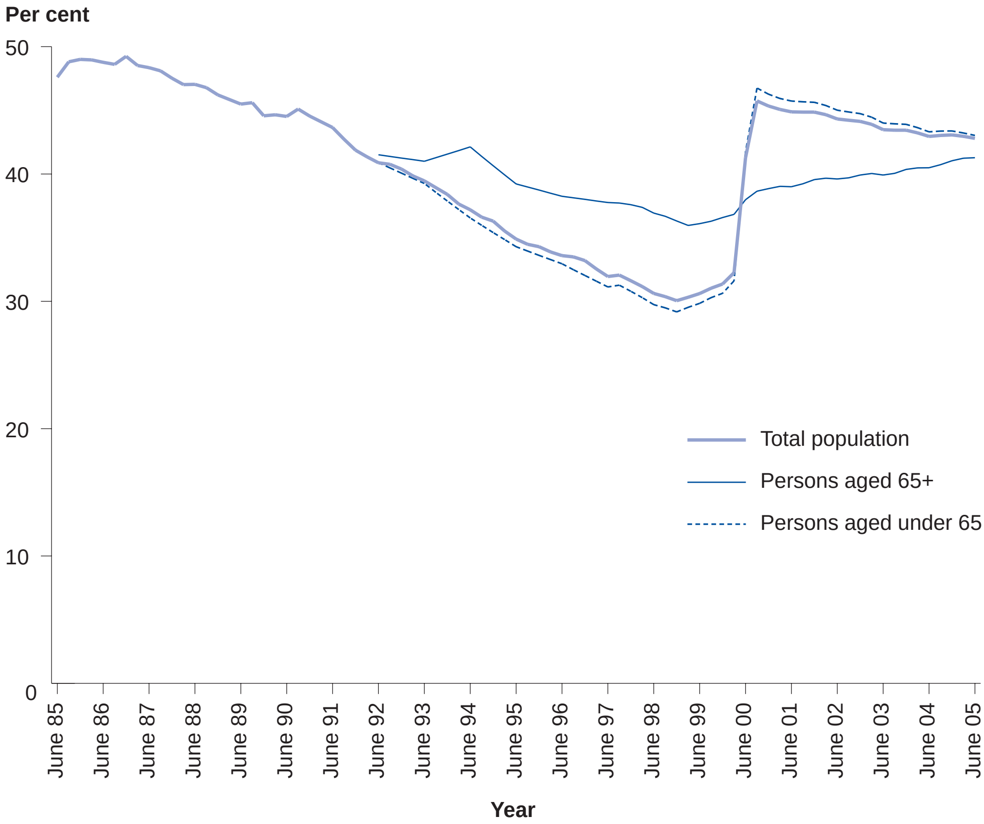
Before 1997, all health benefits paid by the funds, plus the cost of administration, were regarded as health funding by the funds. The introduction of the PHIIS and its replacement non-means-tested rebate meant that part of the revenue used by the funds to pay for the health benefits and administration would be provided by the Australian Government.

In compiling its estimates, the Australian Institute of Health and Welfare (AIHW) allocates the rebates on premiums across all the expenses incurred by the funds each year—for example, 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 included as health funding by the Australian Government. This same 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.

In 2003–04, net benefits paid for private hospital services accounted for $2,721 million, 48.6% of the net health funding by private health insurance funds. Dental benefits ($708 million, 12.6%) and administration ($581 million, 10.4%), were the next largest areas of funding by private health insurance (Tables S50, S51).

Trends in coverage, membership and premiums

At the end of June 2005, 42.8% of the Australian population were covered by private hospital cover (PHIAC 2005). This was similar to the coverage in June 2004 but represented a fall from a peak of 45.7% at the end of the first quarter following the introduction of the lifetime cover arrangements in July 2000 (Figure 6.6).



Sources: OECD 2005; PHIAC 2001, 2002, 2003, 2004, 2005; PHIAC unpublished data.

Figure 6.6: Proportion of Australia's population covered by basic private health insurance, 1985 to 2005

From December 1998 to September 2000, coverage grew each quarter. This was largely due to:

- the introduction, in October 1997, of a tax levy of 1% of taxable income for high-income earners (single people with incomes over $50,000 and couples with incomes greater than $100,000) without insurance cover for hospital services
- replacement of the PHIIS by the non-means-tested 30% rebate on private health insurance premiums in 1999
- the introduction of the lifetime health cover arrangements (Box 6.6).

The greatest immediate influence on the level of coverage occurred between March 2000 and September 2000. Coverage increased from 32.3% in March, a quarter before the deadline for joining a fund (1 July), to 45.7% in September, immediately after the deadline.

After September 2000 there was a consistent fall in the level of coverage each quarter until June 2004. There was a slight recovery after that, such that by June 2005 the level had increased to 42.8% (Figure 6.6).

Comparisons of health funding with other OECD countries

In 2003, Australia's three tiers of government contributed an average of 67.8% to total health expenditure, around 4 percentage points below the OECD unweighted average of 71.8%. Government's proportional contribution in Australia was similar to that in Canada, higher than in Greece and the United States, but lower than in New Zealand. The private sector contributed the remainder of the funding, which was 32.2% in Australia in 2003 (Table S46).

6.2 Health workforce

Access to health care and advice is regarded as essential to quality of life, and 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 in those currently providing health care, but also in the population they serve and in 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, particularly for rural areas. These considerations have led to some significant recent reviews and recommendations (see Box 6.8 for an example).

Box 6.8: The Productivity Commission's report on Australia's health workforce

In 2005, in response to a decision by the Council of Australian Governments (COAG), the Australian Government asked the Productivity Commission to examine issues affecting the health workforce, including the supply of, and demand for, health workforce professionals, and propose solutions to ensure the continued delivery of quality health care over the next 10 years.

The Productivity Commission 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. 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. In addition to the need to train more health workers (with consequent pressures on health budgets), attention needs to be given to improving not only the retention and re-entry to the workforce of qualified health workers, but also the efficiency, effectiveness and distribution of the available workforce.

The Commission's recommendations were aimed at developing a more sustainable and responsive health workforce, while maintaining a commitment to high quality and safe health outcomes. It proposed a set of national workforce structures designed to:

- *support local innovations, and objectively evaluate, facilitate and drive those of national significance through an advisory health workforce improvement agency*

(continued)

- *promote more responsive health education and training arrangements through the creation of an independent advisory council, and a high-level taskforce to achieve greater transparency (and appropriate contestability) of funding for clinical training*
- *integrate the current profession-based accreditation of health education and training through an over-arching national accreditation board that could, initially at least, delegate functions to appropriate existing entities, based on their capacity to contribute to the objectives of the new accreditation regime*
- *provide for national registration standards for health professions and for the creation of a national registration board with supporting professional panels*
- *improve funding-related incentives for workforce change through the transparent assessment by an independent committee of proposals to extend MBS coverage beyond the medical profession, the introduction of (discounted) MBS rebates for a wider range of delegated services, and addressing distortions in rebate relativities.*

Source: Productivity Commission 2005.

The aims of this section are narrower: to provide the most recent data on the numbers, age, sex and distribution of health workers and how many hours they work. Such information is necessary for the development of policies and programs, such as those proposed by the Productivity Commission.

The health workforce, as presented in this chapter, refers to people employed in occupations that provide health care (such as doctors, nurses, dentists, pharmacists and allied health workers). It does not include volunteers, individuals taking action to improve their own health, or people who work in other areas related to the wellbeing of the population (such as social workers).

Data on the health workforce are collected by the ABS through the five-yearly national population censuses and monthly labour force surveys, and by the AIHW through censuses of persons registering as health professionals (Box 6.9).

Box 6.9: Sources of data on the health workforce

There are three main sources of data on the health workforce:

- *The ABS Census of Population and Housing, conducted every five years, collects information from all persons aged 15 years or over about their employment status, occupation and industry. Information from the most recent Census of Population and Housing (2001) was reported in* Australia's health 2004.
- *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 eight months, with one-eighth of the sample being replaced each month. Some data from this survey are reported monthly (for example the unemployment rate), while more detailed information is reported quarterly. This issue of* Australia's health *reports data from the four quarters of 2000 and 2005.*

- *The AIHW compiles the censuses of medical, nursing and allied health workers that are conducted by the states and territories in conjunction with the registration of health professionals. These are done yearly for nursing, medicine and dentistry, and less regularly for other professionals.*

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 five 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 for providing detailed information about smaller population groups or from small areas.

The AIHW health labour force censuses provide more detailed data on characteristics such as the specialty fields and qualifications of health professionals. However, these censuses are not compulsory, and response rates vary between occupations and states/territories. Reporting by the states/territories can also be delayed, so that the most recent information on the medical, nursing and dental workforces, as reported in this edition of Australia's health*, is from 2003. Information on the allied health professions has not been updated since that reported in* Australia's health 2004*, and is not repeated here.*

Health workers work mostly in the health services industry, as would be expected. However, they are also employed in a variety of other industries, such as community services, government administration, education and defence. In 2005, there were nearly 570,000 people working in health occupations, of whom four in five (over 462,000) were working in the health services industry (Figure 6.7).

	Health services industry	Other industries	Total
Health occupations	462,300 employed persons e.g. doctors, nurses, dentists, allied health workers, ambulance officers, etc.	107,400 persons employed in health occupations in other industries e.g. retail pharmacists, safety inspectors, environmental health officers, etc.	**569,700**
Other occupations	260,200 persons employed in other occupations in health industries e.g. clerical workers, service workers, welfare professionals, etc.		
Total	**722,500**		

Source: Unpublished data from ABS Labour Force Survey 2005.

Figure 6.7: The relationship of health occupations to the health services industry and other industries, 2005

Also of interest, however, are people employed in a wide variety of occupations that provide support and infrastructure in the health services industry. These range from clerical workers to cooks, gardeners, cleaners and transport drivers. In 2005, these workers numbered over 260,000 and comprised over a third (36%) of the health services industry.

The health workforce has been undergoing considerable growth in recent years. Between 2000 and 2005, it grew from 452,000 to 570,000, an increase of 26%. This was more than double the increase of 10% in all other occupations over the same period (Table 6.17).

Table 6.17: Persons employed in health occupations, number per 100,000 population, 2000 and 2005

	2000		2005		
Occupation	Number	Per 100,000 population	Number	Per 100,000 population	% growth 2000–2005
Health services managers	4,200	21.8	8,600	42.5	107.5
Generalist medical practitioners	36,700	191.5	36,300	178.6	–1.0
Specialist medical practitioners	16,000	83.7	23,600	116.3	47.4
Medical imaging professionals	8,600	45.0	10,600	52.4	23.4
Dental practitioners	7,000	36.8	8,700	42.9	23.6
Dental associate professionals	4,300	22.5	5,700	28.1	32.5
Dental assistants	12,200	63.7	17,300	85.2	42.0
Nursing workers: professionals	181,100	945.6	204,700	1,006.9	13.0
Enrolled nurses	24,800	129.5	32,200	158.2	29.6
Personal care and nursing assistants	36,100	188.7	68,500	336.9	89.5
Pharmacists	15,300	80.0	14,900	73.3	–2.8
Physiotherapists	12,100	63.4	14,300	70.6	18.1
Psychologists	9,300	48.4	13,900	68.6	50.5
Occupational therapists	5,400	28.4	7,800	38.4	43.3
Podiatrists	1,400	7.1	2,100	10.2	52.9
Other allied health workers	14,800	77.1	14,000	69.0	–4.9
Complementary therapists	7,800	40.6	11,400	55.9	46.1
Other health workers	54,600	284.9	74,900	368.5	37.3
All health workers	**451,800**	**2,358.8**	**569,700**	**2,802.4**	**26.1**
All other occupations	8,499,500	44,377.0	9,387,700	46,179.5	10.4
Total all occupations	**8,951,300**	**46,735.8**	**9,957,300**	**48,981.9**	**11.2**

Note: Numbers have been rounded to nearest 100; columns may not sum to totals due to rounding.

Source: Unpublished data from ABS Labour Force Surveys, 2000 and 2005.

Growth in numbers alone does not provide a full picture, however. Other changes, such as trends in hours worked by health workers and growth in the size of the population they are serving, can affect the amount of health care delivered. Also, a broad presentation can mask pockets of under- or over-supply in different areas, for different age groups or for different segments of the population.

For example, between 2000 and 2005 Australia's population increased from 19.2 million people to 20.3 million (an increase of 6.1%). On the face of it, this suggests that the supply of health workers, with its 26% growth over this period, is increasing at a much faster rate than the population (there was an increase from 2,359 to 2,802 health workers per 100,000 population—Table 6.17). But this was not the pattern for every health occupation: supply fell for general practitioners (down from 192 to 179 per 100,000), pharmacists (down from 80 to 73 per 100,000) and the broad group of 'other allied health workers' (down from 77 to 69 per 100,000).

Moreover, this kind of broad analysis does not take into account the ageing of the population over that period or any associated increase in need for health care for certain age-related conditions (or decreases in the proportion of children in the population and in associated special health care needs).

The occupation group with by far the largest number of workers in 2005 was nurses (305,400, comprising 204,700 nursing professionals, 32,200 enrolled nurses and 68,500 personal care and nursing assistants). This was followed by medical practitioners (59,900, comprising 36,300 general practitioners and 23,600 specialists), dental workers (31,700, comprising 8,700 dental practitioners, 5,700 dental associate professionals and 17,300 dental assistants), pharmacists (14,900), physiotherapists (14,300) and psychologists (13,900).

Workforce supply—the stocks and flows

A key point in the current national debate about the health workforce is the supply of health workers: the numbers entering and leaving. 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 can be measured
- the inputs to and exits from the workforce are measurable, and lead and lag times are understood.

These relationships are described in Box 6.10 and illustrated in Figure 6.8. Three aspects of supply are examined here in further detail: the numbers completing health courses, the numbers moving in and out of the country, and the numbers soon to retire from the workforce.

Box 6.10: The workforce supply pipeline

For the health workforce, the current total 'stock' can be measured using ABS Census of Population or Labour Force Survey figures. The size and composition of the major health professions can be measured to finer detail using the regular AIHW labour force censuses.

The inputs to the workforce include new entrants from education institutions (higher education for professionals, vocational education and training institutions for associate professionals, and secondary colleges for others); from skilled immigration; and from increases in hours worked. Exits include resignations, retirements, deaths and reductions in hours worked. There is also some 'churning' due to those leaving the workforce temporarily (for an extended break, for family reasons or for temporary work overseas or in another profession) and returning at a later date.

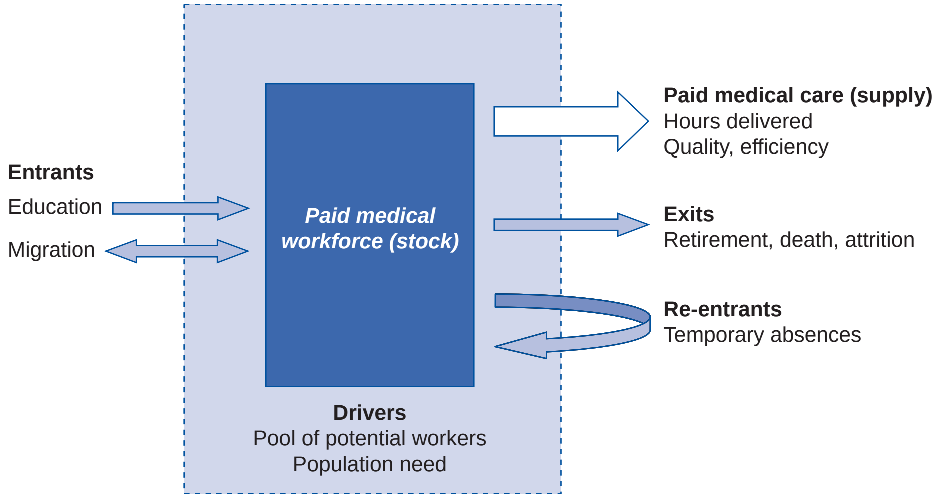


Figure 6.8: The workforce supply pipeline

How many people are completing health courses?

For the health professions (such as registered nurses, medical practitioners, dentists, pharmacists, radiographers, occupational therapists, and so forth), graduation from a relevant university course is a requirement to practise. Accordingly, an important source of entrants into these occupations is Australian residents completing health-related higher education courses each year.

Between 2001 and 2003, there was an overall increase of 7.4% in those completing such courses (Table 6.18). Increases were recorded for each health field except podiatry, where there was a 6.9% decrease. The largest growth occurred in the fields of nutrition and dietetics (up 49.2%) and the complementary therapies (up 16.1%), although both of these started from a relatively low base. Medicine (up 14.7%) and physiotherapy (up 13.6%) also had large increases. The smallest increases were for occupational therapy (up 2.1%) and the very large field of nursing (up 4.6%).

The National Health Performance Committee has developed an indicator of sustainability for three professions—pharmacy, medicine and nursing: 'Graduates as a percentage of the total pharmacy, medical and nursing workforce' (NHPC 2004:114). The 'sustainability ratio' can be calculated using course completions as a percentage of people employed in those professions in the corresponding year, based on AIHW labour force census data. At the time of writing, 2001 and 2003 AIHW labour force data were available only for nursing and medicine. Between 2001 and 2003, the 'sustainability ratio' increased for registered nurses (from 2.77 to 2.80) and for medical practitioners (from 2.26 to 2.46) (Table 6.18).

Table 6.18: Australian citizens/residents completing selected health-related higher education courses, by sex and field of study, 2001 and 2003

	2001				2003				
Field	Number	% female	% of workforce (sustainability ratio)[(a)]	% undergraduate[(b)]	Number	% female	% of workforce (sustainability ratio)[(a)]	% undergraduate[(b)]	% change in number, 2001 to 2003
Nursing	5,072	88.1	2.77	. .	5,306	89.1	2.80	. .	4.6
Public health	1,686	68.7	. .	34.8	1,783	68.6	. .	33.9	5.8
Medical	1,208	47.6	2.26	. .	1,385	48.7	2.46	. .	14.7
Physiotherapy	784	60.1	. .	80.9	891	61.6	. .	76.4	13.6
Pharmacy	683	63.3	. .	88.1	729	68.7	. .	91.8	6.7
Rehabilitation services—other	646	61.5	. .	50.0	705	63.7	. .	55.6	9.1
Occupational therapy	665	90.2	. .	88.4	679	88.2	. .	85.6	2.1
Radiography	571	69.7	. .	67.1	605	70.2	. .	72.6	6.0
Speech pathology/ audiology	401	94.0	. .	80.5	431	94.9	. .	73.8	7.5
Complementary therapies	353	65.7	. .	76.8	410	73.9	. .	82.4	16.1
Nutrition and dietetics	248	89.5	. .	51.2	370	88.6	. .	76.5	49.2
Dentistry	339	54.9	. .	81.1	368	48.6	. .	77.7	8.6
Optometry	172	59.9	. .	58.1	181	49.7	. .	62.4	5.2
Podiatry	145	57.9	. .	93.8	135	59.3	. .	93.3	–6.9
Health—other	2,009	53.0	. .	83.0	2,112	56.4	. .	79.6	5.1
Total	**14,982**	**71.9**	**. .**	**69.1**	**16,090**	**72.9**	**. .**	**69.3**	**7.4**

(a) For nursing, the denominator is all registered nurses in respective years; for medical, the denominator is all employed medical practitioners in respective years.

(b) Excludes medical and nursing, as course level is not applicable for these fields.

Note: Figures for earlier years are not presented because there was a change in the classification of 'field' in 2001. 2003 is the latest year for which higher education completions data are available.

Source: AIHW analysis of Department of Education, Science and Training data.

How many health professionals are moving to and from Australia?

Another important source of new entrants to the health workforce is the immigration of skilled workers. At the same time, of course, some skilled workers are leaving Australia. In 2004–05, 14,094 health professionals entered Australia and 9,328 left it for stays of 12 months or more (defined as 'long-term'), a net gain of 4,766 health professionals (Table 6.19). However, these arrivals and departures are not all for employment reasons, and therefore cannot be equated precisely with additions to and losses from the health labour force. Information on 'reason for journey' is available only for long-term visitor arrivals and long-term resident departures; 61% of health professionals in the first of these groups and 54% of those in the second gave 'employment' as their reason for moving in 2004–05.

Table 6.19: Movement of health professionals: overseas arrivals and departures, 2004–05

	Arrivals				Departures			
Occupation	Long-term residents	Permanent settlers	Long-term visitors	Total arrivals	Long-term residents	Permanent residents	Long-term visitors	Total departures
General medical practitioner	735	653	2,221	3,609	760	394	1,036	2,190
Specialist medical practitioner	74	97	138	309	53	30	60	143
Nurses (incl. midwives)	1,895	1,833	2,891	6,619	1,873	987	1,339	4,199
Dental practitioners	121	172	225	518	99	70	85	254
Pharmacists	186	294	181	661	247	81	104	432
Occupational therapists	187	95	85	367	309	50	40	399
Optometrists	102	125	142	369	107	82	99	288
Physiotherapists	388	179	210	777	391	103	95	589
Speech pathologists	81	17	24	122	99	27	10	136
Chiropractors/ osteopaths	31	14	27	72	49	27	20	96
Podiatrists	29	24	11	64	35	8	3	46
Medical imaging professionals	181	95	76	352	201	58	54	313
Other health professionals	121	79	56	256	139	45	58	242
Total	4,131	3,677	6,286	14,094	4,361	1,963	3,004	9,328

Note: This table includes all movements, including movements of Australian citizens, regardless of the purpose (i.e. employment, holiday, etc.) but excludes short-term movements (i.e. less than 12 months).

Source: Unpublished data from ABS Overseas Arrivals and Departures database.

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 considerable 'churning' among younger age groups also occurs, especially in the female-dominated occupations). 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 the 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 postwar 'baby boom' cohort through the age groups. For example, in 2005, 43.1% of the health workforce was aged 45 years or more, compared with 37.0% in 2000, and the proportion will continue to rise over the following few years. Assuming retirement age does not change, this suggests that up to 40% of the current workforce may retire in the next decade or so. The health workforce is ageing more quickly than the non-health workforce (for which the proportion aged 45 years or more rose from 32.4% in 2000 to 35.5% in 2005) (Table 6.20).

Table 6.20: Persons employed in health occupations: proportion aged 45 years and over, by sex, 2000 and 2005 (per cent)

	2000			2005		
Occupation	**Males**	**Females**	**Total**	**Males**	**Females**	**Total**
Health services managers	30.5	70.6	63.2	66.6	66.0	66.2
Generalist medical practitioners	46.2	27.3	39.7	47.9	35.6	42.6
Specialist medical practitioners	54.8	29.2	48.1	53.0	28.1	46.0
Medical imaging professionals	34.2	28.4	30.6	52.0	36.3	40.1
Dental practitioners	38.5	11.6	33.7	45.5	27.9	41.4
Dental associate professionals	51.0	5.4	24.9	65.3	30.5	48.5
Dental assistants	53.9	19.9	20.2	49.2	14.7	15.0
Nursing workers: professionals	29.6	39.1	38.3	32.4	48.9	47.4
Enrolled nurses	32.5	33.0	32.9	27.8	48.6	47.3
Personal care and nursing assistants	33.4	43.0	40.6	42.2	49.9	48.4
Pharmacists	57.0	23.5	39.8	58.9	33.6	44.3
Physiotherapists	11.8	30.2	27.0	21.8	29.7	26.5
Psychologists	50.0	34.4	39.1	56.0	35.0	39.5
Occupational therapists	0.0	13.5	11.8	11.4	26.0	23.6
Podiatrists	66.5	14.1	39.6	19.9	15.3	16.8
Other allied health workers	48.7	35.0	37.5	43.2	31.3	34.1
Complementary therapists	29.3	32.6	31.1	34.6	39.8	37.5
Other health workers	42.0	29.5	35.7	45.8	29.5	37.0
All health workers	**41.7**	**35.3**	**37.0**	**44.4**	**42.7**	**43.1**
All other occupations	33.8	30.6	32.4	36.6	34.0	35.5
Total all occupations	**34.0**	**31.0**	**32.6**	**36.8**	**34.8**	**35.9**

Source: Unpublished data from ABS Labour Force Surveys, 2000 and 2005.

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.

Health occupations where loss from retirement may be more severe include some of the older 'established' occupations: health services managers, general practitioners, medical specialists, medical imaging professionals, dentists, dental associate professionals, all of the nursing occupations and pharmacists—in all of which the proportion aged 45 years and over exceeds 40%.

How many health workers are full-time and how many part-time?

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, a substantial number work part time. In others, such as the medical profession, it is usual to work more than the 'standard' 35 hours per week.

In 2005, the health professions with the longest average working weeks were specialist medical practitioners (42.7 hours), health services managers (40.6 hours), general practitioners (39.9 hours) and dentists (37.9 hours); and those with the shortest working weeks were personal care and nursing assistants (27.3 hours), enrolled nurses (27.7 hours), nursing professionals (28.8 hours), dental assistants (29.6 hours), occupational therapists (29.1 hours) and allied health professionals (29.2 hours) (Table 6.21). Among the health professions, medical specialists, general practitioners and dentists were the ones with the lowest proportions of females (27.9%, 43.4% and 23.5%, 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 79.9%, 93.7%, 90.9% and 98.9% being female, respectively).

Between 2000 and 2005 there was a general reduction in average hours worked in health occupations—down almost one hour (0.9 hours) per week. This was evident in almost all of the health professions, the only exceptions being for dental assistants and complementary therapists (with increases of 1.0 hours and 0.4 hours per week, respectively). The largest decreases in hours worked were for occupational therapists (down 5.2 hours per week), podiatrists (4.6 hours), general practitioners (3.6 hours), pharmacists (2.6 hours), psychologists (2.5 hours) and medical specialists (2.3 hours) (Table 6.21). The drop in hours could be partly explained by an increase in the proportion of health workers who were female (up from 44.1% in 2000 to 44.9% in 2005). There were substantial rises in the female proportions of each of the fields above, except for occupational therapists and medical specialists.

In terms of full-time equivalents (Box 6.11), the combination of changes in numbers and changes in hours worked resulted in a 20.9% increase in supply overall (from 422,459 full-time equivalent (FTE) in 2000 to 510,775 in 2005) and in almost all individual health professions. The exceptions were general practitioners (down 9.3%), pharmacists (down 9.5%) and the group termed 'other allied health workers' (down 11.5%). In each of these cases, there were declines in numbers as well as in hours worked.

Box 6.11: Full-time equivalent

The full-time equivalent (FTE) is based on units of 35 hours worked per week, which is the ABS standard for one person working full-time. So if two people each work 17.5 hours per week, for example, they together make up one FTE. Similarly, six people working half-time would make up 3 FTE.

FTE measures how many 35-hour week workloads are being worked, and therefore provides a measure of the supply of workers because it takes into account both those working full-time and those working part-time.

Table 6.21: Persons employed in health occupations: hours worked, proportion female and full-time equivalent (FTE) workers, 2000 and 2005

	2000			2005				
Occupation	Average hours worked per week (Hours)	Prop'n female (%)	FTE[(a)]	Average hours worked per week (Hours)	Prop'n female %	FTE[(a)]	Change in FTE 2000–2005 (%)	Change in hours worked 2000–2005 (Hours)
Health services managers	41.8	81.3	4,975	40.6	70.6	10,033	101.7	–1.2
Generalist medical practitioners	43.5	34.3	45,574	39.9	43.4	41,337	–9.3	–3.6
Specialist medical practitioners	45.1	26.2	20,647	42.7	27.9	28,853	39.7	–2.3
Medical imaging professionals	35.6	62.3	8,773	34.0	75.5	10,347	17.9	–1.6
Dental practitioners	39.0	18.0	7,861	37.9	23.5	9,432	20.0	–1.1
Dental associate professionals	32.7	57.3	4,027	32.0	48.2	5,222	29.7	–0.7
Dental assistants	28.6	99.3	9,971	29.6	98.9	14,650	46.9	1.0
Nursing workers: professionals	29.6	91.5	153,098	28.8	90.9	168,153	9.8	–0.8
Enrolled nurses	28.9	93.3	20,474	27.7	93.7	25,483	24.5	–1.1
Personal care and nursing assistants	27.4	75.4	28,298	27.3	79.9	53,501	89.1	–0.1
Pharmacists	37.7	51.4	16,521	35.1	57.6	14,953	–9.5	–2.6
Physiotherapists	33.7	82.4	11,697	32.9	59.6	13,501	15.4	–0.8
Psychologists	34.9	70.0	9,237	32.4	78.6	12,910	39.8	–2.5
Occupational therapists	34.3	87.1	5,334	29.1	83.6	6,480	21.5	–5.2
Podiatrists	37.6	51.3	1,454	33.0	66.9	1,952	34.3	–4.6
Other allied health workers	31.4	81.7	13,251	29.2	76.6	11,721	–11.5	–2.2
Complementary therapists	32.3	54.6	7,179	32.7	54.7	10,621	48.0	0.4
Other health workers	34.7	50.4	54,088	33.5	53.8	71,623	32.4	–1.2
All health workers	**32.7**	**73.3**	**422,459**	**31.4**	**74.2**	**510,775**	**20.9**	**–1.3**
All other occupations	35.7	42.5	8,675,081	34.9	43.1	9,362,068	7.9	–0.8
Total all occupations	**35.6**	**44.1**	**9,097,540**	**34.7**	**44.9**	**9,872,844**	**8.5**	**–0.9**

(a) Based on a standard full-time working week of 35 hours.

Source: Unpublished data from ABS Labour Force Surveys, 2000 and 2005.

The large nursing occupations all had substantial increases in supply, driven by increases in numbers that outstripped their decreases in hours worked: FTE for nursing professionals rose by 9.8%, for enrolled nurses by 24.5% and for personal care and nursing assistants by 89.1%. Other professions with large percentage gains in supply (although smaller in number) included health services managers (up by 101.7%, a doubling in their supply), complementary therapists (up 48.0%), dental assistants (46.9%), psychologists (39.8%), medical specialists (39.7%) and podiatrists (34.3%).

How many doctors, nurses and dentists are working in Australia?

The AIHW health labour force censuses provide more detailed data than the ABS Labour Force Survey on the personal characteristics, working patterns and distribution of the major health professions. These censuses cover all persons registered (or 'enrolled' in the case of enrolled nurses) in each profession; the censuses exclude those who are qualified but not registered. Therefore they include some people who are registered in the profession but not employed in it (Figure 6.9). For example, in 2003, 64,042 persons were registered as medical practitioners in Australia, of whom 56,207 (87.8%) were currently working in medicine (AIHW 2005d:3). In the same year there were 273,377 registered and enrolled nurses, of whom 236,645 (86.6%) were employed in nursing (AIHW 2005e:3).

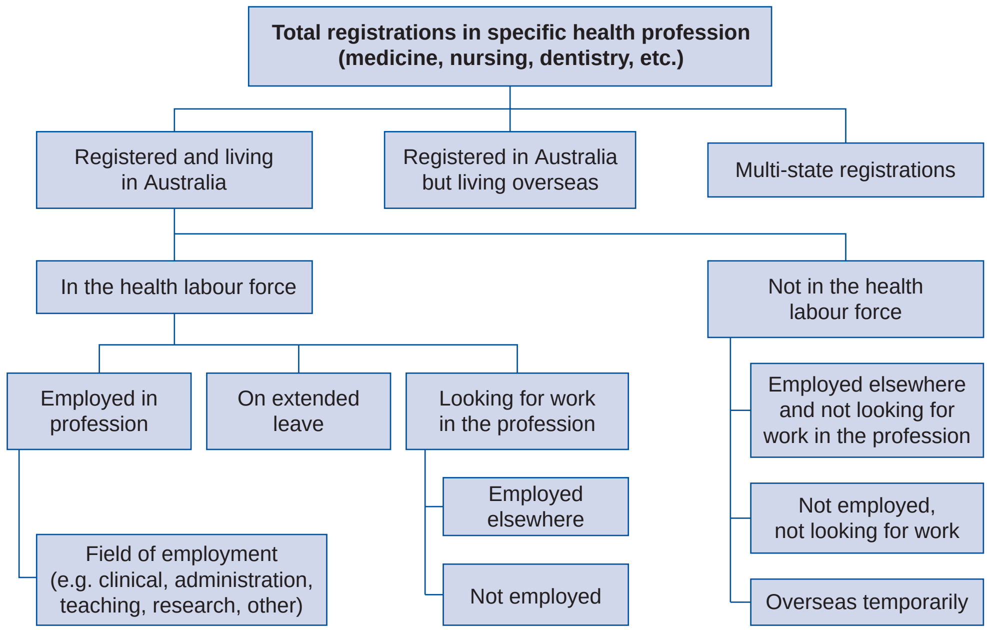


Figure 6.9: Distribution of those registered in a health profession, by employment status

The following tables provide state/territory and regional comparisons for 1997 and 2003 (the most recent year for which data are available) for those currently working in the medical and nursing groups, and for 2000 and 2003 for those working in the dental professions.

The medical labour force

In 2003, the states with the largest numbers of employed medical practitioners were those with the largest populations: New South Wales (19,188), Victoria (14,782) and Queensland (9,173) (Table 6.22). In terms of number per 100,000 population, though, the two territories had the highest rate: the Northern Territory (446 per 100,000) and the Australian Capital Territory (372 per 100,000, although it should be noted that this population is almost entirely urban).

Table 6.22: Employed medical practitioners, states and territories, 1997 and 2003

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
					Number				
1997	17,026	11,911	8,024	4,385	4,256	1,158	976	462	48,198
2003	19,188	14,782	9,173	4,709	4,928	1,338	1,204	886	56,207
					Number per 100,000 population				
1997	271	259	236	244	287	245	316	247	260
2003	287	301	241	241	323	280	372	446	283

Note: Components may not add to totals due to rounding.

Source: AIHW Medical Labour Force Censuses, 1997 and 2003.

Between 1997 and 2003 the number of medical practitioners rose in all states and territories, and the number per 100,000 population rose in all jurisdictions except Western Australia. In total there were 56,207 medical practitioners in Australia in 2003, compared with 48,198 in 1997 (a rise of 16.6% overall). Over the same period the number per 100,000 rose from 260 to 283 overall, and there were increases in all states and territories except Western Australia, where there was a small decline from 244 to 241 medical practitioners per 100,000.

Across the geographical regions, the largest number of medical practitioners (43,010) worked in the Major Cities of Australia in 2003, and this decreased with increasing remoteness to 230 in Very Remote areas (Table 6.23). The pattern was similar for the number per 100,000 population, which decreased markedly from 326 per 100,000 population in Major Cities to 130 per 100,000 in Very Remote areas. This drop in supply with increasing remoteness was countered to some extent by patterns of hours worked:

Table 6.23: Employed medical practitioners, by type of practitioner and remoteness areas[(a)], 2003

	Major Cities	Inner Regional	Outer Regional	Remote	Very Remote	Total[(b)]
Type of medical practitioner						
Clinicians	39,389	7,074	2,948	468	212	51,819
Primary care practitioners	15,132	3,901	1,740	301	152	21,919
Hospital non-specialists	4,561	659	359	69	42	5,915
Specialists	14,580	2,164	665	79	15	18,093
Specialists-in-training	5,116	350	185	20	3	5,892
Non-clinicians	3,621	372	205	30	18	4,388
Total	**43,010**	**7,446**	**3,154**	**498**	**230**	**56,207**
No. per 100,000 population	326	179	155	154	130	283
Percentage female	32.6	27.4	30.3	31.5	35.0	31.9
Average age (years)	45.7	46.8	45.1	44.7	43.4	45.9
Average hours worked per week	44.2	44.8	46.2	47.8	50.0	44.4

(a) See Box 4.3 for an explanation of Australian Standard Geographic Classification Remoteness Areas.

(b) Includes 1,870 medical practitioners who did not provide information on the location of their main job.

Source: AIHW Medical Labour Force Census, 2003.

the average hours worked by medical practitioners increased from 44.2 per week in Major Cities to 50.0 per week in Very Remote areas. Comparing Very Remote areas with all others, there was a higher proportion of female practitioners and the average age of practitioners was lower.

It might be expected that older doctors and female doctors would work fewer hours per week, on average, than younger or male doctors. However, taking the medical workforce as a whole, hours worked did not seem to be influenced by either the proportion of those who were female in each area or by the average age of doctors.

Consistent with the placement of the large teaching hospitals near population centres, Major Cities and Inner Regional areas together accounted for 84.3% of specialists and 92.8% of specialists in training. However, primary care practitioners (86.8%) and hospital non-specialists (88.3%) were even more likely than specialists to work in those areas.

The nursing labour force

As for medical practitioners, the largest number of nurses worked in the states with the largest populations: New South Wales (74,480 nurses in 2003), Victoria (66,534) and Queensland (39,463) (Table 6.24). However, the pattern of supply (in terms of numbers of nurses relative to population) differed: the states/territories with the largest supply in 2003 were the Northern Territory (1,575 per 100,000 population), South Australia (1,434 per 100,000) and Victoria (1,355 per 100,000). Moreover, their supply distribution did not appear to vary from the national average (1,191 per 100,000) as much as for doctors.

Table 6.24: Employed registered and enrolled nurses, states and territories, 1997 and 2003

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
					Number				
1997	70,397	61,488	36,800	21,757	20,466	6,002	3,388	2,230	222,528
2003	74,480	66,534	39,463	20,984	21,883	6,354	3,821	3,126	236,645
					Number per 100,000 population				
1997	1,122	1,338	1,084	1,212	1,382	1,267	1,096	1,193	1,202
2003	1,115	1,355	1,038	1,076	1,434	1,331	1,182	1,575	1,191
					Percentage registered				
1997	81.7	74.7	82.4	78.9	76.4	82.2	84.2	84.4	79.2
2003	83.0	73.8	84.2	80.1	76.3	85.4	83.5	89.3	79.9

Sources: AIHW Nursing Labour Force Censuses, 1997 and 2003.

The highest proportions of nurses who were registered (as opposed to enrolled) were in the Northern Territory (89.3% in 2003), Tasmania (85.4%) and Queensland (84.2%). In Victoria and South Australia the percentage of registered nurses (73.8% and 76.3% respectively) fell below the national average of 79.9%. In Victoria's case, this is surprising, given that it is a highly urbanised state and nurses in Major Cities are more likely to be registered than those outside them. However, it could be a consequence of differences between jurisdictions' policies regarding roles of personal care and nursing assistants, particularly in aged care. Between 1997 and 2003, the number of nurses per 100,000 population declined slightly (from 1,202 to 1,191). Western Australia experienced a decline in both the numbers and rate of nurses per 100,000 population over this period. Numbers and rates rose most markedly in the Australian Capital Territory and the Northern Territory.

Nurses are more evenly distributed across the regions than medical practitioners, and this is shown by the smaller variation in their number per 100,000 population, which ranged from 1,120 nurses per 100,000 in Major Cities to 1,095 per 100,000 in Very Remote areas (Table 6.25).

In all regions, nurses were mostly female—around 90% everywhere. They tended to be younger in Major Cities (with an average age of 42.5 years) than in other areas (just over 44 years in each). Their working week tended to be longer in Very Remote areas (37.8 hours per week, on average) and Remote areas (34.1 hours) than elsewhere.

Table 6.25: Employed registered and enrolled nurses, by remoteness areas of main job[(a)], 2003

	Major Cities	Inner Regional	Outer Regional	Remote	Very Remote	Total[(b)]
Number	147,670	48,440	22,719	3,870	1,936	236,645
No. per 100,000 population	1,120	1,167	1,115	1,193	1,095	1,191
Percentage female	91.2	90.9	93.9	93.3	89.7	91.4
Percentage registered	83.3	75.0	71.5	73.4	79.1	79.9
Average age (years)	42.5	44.2	44.3	44.2	44.3	43.1
Average hours worked per week	32.8	31.7	32.3	34.1	37.8	32.5

(a) See Box 4.3 for an explanation of Australian Standard Geographic Classification Remoteness Areas.

(b) Includes 12,009 nurses who did not provide information on the location of their main job.

Source: AIHW Nursing Labour Force Census, 2003.

The 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 or by direct mailing of labour force questionnaires to all registered practitioners. However, states and territories do not uniformly register practitioners of other dental occupations. Hence information about dental occupations other than dentists is derived from a range of sources, including professional associations, dental boards and state health departments.

The distribution of employed dentists varies widely across Australia (Table 6.26). The highest rates (numbers per 100,000 population) in 2003 occurred in the Australian Capital Territory (66.8) and South Australia (54.5), and the lowest were in Tasmania (33.0) and the Northern Territory (32.7).

In 2003, the rates of dental therapists per 100,000 population in Western Australia (16.1) and Tasmania (12.7) were more than double the average for Australia (6.3), while the lowest rate occurred in New South Wales (2.9). The rates for dental hygienists also varied widely around the average rate for Australia (2.9), with the highest in the Australian Capital Territory (9.2) and the lowest in Tasmania (1.3). Dental prosthetists were more evenly spread among the states and territories than therapists and hygienists, the exceptions being Tasmania at 10.4 (where the rate was more than double the Australian average of 4.5) and South Australia at 1.9 (less than half the average).

Table 6.26: Employed dental labour force, states and territories, 2000 and 2003

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
					Number				
Dentists									
2000	3,126	2,204	1,564	913	821	119	184	60	**8,991**
2003	3,346	2,284	1,821	957	833	157	216	65	**9,678**
Dental therapists									
2000	216	140	361	331	128	50	16	19	**1,260**
2003	195	153	354	314	128	61	22	16	**1,242**
Dental hygienists									
2000	58	79	45	82	110	. .	22	2	**398**
2003	104	123	81	93	134	6	30	6	**577**
Dental prosthetists									
2000	304	260	117	60	27	52	16	. .	**836**
2003	308	268	125	84	29	50	15	. .	**795**
					Number per 100,000 population				
Dentists									
2000	48.4	46.3	43.9	48.5	54.8	25.3	59.3	30.5	**46.9**
2003	50.1	46.5	47.9	49.1	54.5	33.0	66.8	32.7	**48.7**
Dental therapists									
2000	3.3	2.9	10.1	17.6	8.5	10.6	6.1	8.2	**6.6**
2003	2.9	3.1	9.3	16.1	8.4	12.7	6.9	8.0	**6.3**
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	11.1	5.1	. .	**4.4**
2003	4.6	5.5	3.3	4.3	1.9	10.4	4.8	. .	**4.5**

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; as such 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.

Source: AIHW DSRU Dental Labour Force data collection, 2003.

Just as the distribution of employed dentists per 100,000 population varies widely across the states and territories, so it also varies widely across the regions (Table 6.27). The rate in Major Cities (57.6) was more than three times that in Remote and Very Remote areas (18.1). This distribution was similar for dental hygienists, where the highest rate (Major Cities, 3.8) was three times that in Outer Regional areas (1.1); the lowest rate (0.0) occurred in Remote/Very Remote areas. However, for dental therapists and dental prosthetists the highest rates occurred outside the Major Cities. The highest rate for dental therapists (8.5) was in Outer Regional areas, while that for dental prosthetists (4.8) was in Inner Regional areas.

Table 6.27: Employed dental labour force, by remoteness area of main job, 2003

	Major Cities	Inner Regional	Outer Regional	Remote/ Very Remote	Australia
			Number		
Dentists	7,590	1,433	564	91	9,678
Dental therapists	720	322	173	28	1,242
Dental hygienists	502	51	23	–	577
Dental prosthetists	542	194	53	5	794
			Number per 100,000		
Dentists	57.6	34.5	27.7	18.1	48.7
Dental therapists	5.5	7.7	8.5	5.5	6.3
Dental hygienists	3.8	1.2	1.1	0.0	2.9
Dental prosthetists	4.7	4.8	3.0	1.2	4.5

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.

Source: AIHW DSRU Dental Labour Force data collection, 2003.

In 2003, 26.4% of employed dentists were female, up from 22.9% in 2000. The average age of female dentists in 2003 was 38.1 years, while for males it was 46.9 years. Females worked on average 33.8 hours per week, while males worked 40.5 hours. There were only small numbers of male dental therapists and dental hygienists: 99% of therapists and 97% of hygienists were female. Therapists and hygienists were similar in average hours worked per week (29.3 and 29.4 hours respectively), but differed in average age (40.2 and 36.5 years respectively). The average age of dental prosthetists was 49.0 years, they worked on average 43.0 hours per week, and 9% were female (Table 6.28).

Table 6.28: Employed dental labour force, selected characteristics, 2003

	Dentists	Dental therapists	Dental hygienists	Dental prosthetists
Percentage female	26.4	98.6	97.1	8.9
Average age (years)	44.6	40.2	36.5	49.0
Average hours worked per week	38.7	29.3	29.4	43.0

Note: Average hours based on hours totalled for all practice locations.

Source: AIHW DSRU Dental Labour Force data collection, 2003.

Comparisons of health workforce with other OECD countries

It is difficult to compare the numbers of health professionals in Australia with other countries because of differences in how each profession is defined and how workers are registered. *OECD Health Data* (the OECD's health database) includes information on the numbers of health workers in member countries, including those with economies and health systems most similar to Australia's—New Zealand, Canada, the United States of America and the United Kingdom. In 2003 Australia had higher numbers of general practitioners and nurses relative to population than did the four other countries. The rate of dentists was similar in all five countries, while that of medical specialists ranged from 0.7 to 1.5 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 countries, or to differences in definitions. Of the 27,834 general practitioners working in Australia in 2003, 21,919 were 'primary care practitioners' and the remaining 5,915 were non-specialist clinicians (including interns, resident medical officers and career medical officers) working in hospitals. Some countries do not include this latter category among general practitioners. It should also be noted that when compared to all OECD countries (see Figure 1.1), Australia is in the upper third for numbers of general practitioners per population.

Table 6.29: Health professionals employed in selected OECD countries, number and rate[(a)], 1998 and 2003

Occupation/	Australia		New Zealand		Canada		USA		United Kingdom	
year	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
General practitioners										
1998	24,601	1.3	3,159	0.8	30,113	1.0	206,970	0.8	36,715	0.6
2003	27,834	1.4	3,006	0.7	31,115	1.0	215,225[(b)]	0.8[(b)]	37,837	0.6
Medical specialists										
1998	20,084	1.1	2,536	0.7	32,824	1.1	386,110	1.4	74,269	1.3
2003	23,985	1.2	2,873	0.7	34,320	1.1	418,920[(b)]	1.5[(b)]	90,422	0.7
Dentists										
1998	8,500	0.5	1,496	0.4	16,490	0.5	151,300	0.5	24,174	0.4
2003	9,666	0.5	1,662	0.4	18,265	0.6	156,900[(b)]	0.5[(b)]	27,199	0.5
Nurses										
1998	198,630	10.6	36,763	9.6	307,087	10.2	2,180,040	7.9	470,000	7.9
2003	207,451	10.4	36,514	9.1	309,576	9.8	2,274,080[(b)]	7.9[(b)]	540,000	9.1

(a) Number of workers per 1,000 population.

(b) 2002 figures.

Sources: OECD 2005; 2003 data for Australia are from AIHW Medical and Nursing Labour Force Censuses, 2003 (AIHW 2005d, 2005e) and AIHW DSRU Dental Labour Force data collection, 2003.

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7 Health services

Health services are, in essence, the means by which health care in its many forms is provided to patients, clients, other health consumers, or the wider population in general. Either directly, or indirectly through the employment or engagement of health professionals and other workers, the provision of health services (including pharmaceuticals) accounts for the vast majority of expenditure described in the previous chapter. These health services relate to the 'interventions' component of the conceptual framework in Chapter 1.

The approach taken in this chapter is to present the range of health services with a progressively narrower focus on specific services or population groups. That is, the opening section on public health describes services that apply to the whole population or targeted subpopulations—generally to prevent disease and promote health—followed by medical services (such as seeing a doctor) which relate to nearly the entire population and focus on management or treatment of health issues, and so on down to more specific services that apply only to smaller subgroups of the population.

7.1 Public health interventions

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 sub-groups' (NPHP 1998:1).

As best as health sector expenditure can be assessed, around $1.3 billion was expended by governments on public health activities in Australia in 2003–04, representing less than 2% of total health expenditure.

The boundaries of public health have been difficult to mark out, and the term is often used interchangeably with 'population health', 'preventive health' and occasionally with 'primary health care'. To further confuse the matter, the media often portray public health simply as what is done in public hospitals, which is rather the other end of the health care spectrum to that discussed here.

The boundary between public health and clinical practice is unclear: for example, do preventive services delivered on a one-to-one basis to individuals (such as screening-related tests, immunisation, and counselling and lifestyle advice to support healthy behaviour) meet the 'organised' and 'population' criteria? Another aspect of the boundary issue is whether it should include the activities of—and investments by—the non-health portfolios of governments (such as education and transport), local governments and non-government organisations. These are acknowledged for their influence on the population's health, but health is not their primary aim.

In essence, public health interventions focus on prevention, promotion and protection rather than on treatment; on populations or population groups rather than on individuals; and on the factors and behaviours that cause illness. (See the Glossary for another version of what public health is.)

Public health activities take the form of programs, campaigns or sometimes just an event. They draw on a very large range of methods (see Box 7.1) and apply in multiple settings (such as schools, homes, workplaces, through the media), all relating to a broad spectrum of health issues. They are variously carried out by state and territory governments, the Australian Government, and other agencies such as anti-cancer councils and the Heart Foundation. Examples of a number of public health methods are given below, featuring the three national cancer screening programs.

Box 7.1: Public health functions and methods

Public health interventions draw on a range of methods to serve a variety of functions. A current conceptualisation of these functions and methods arises from work to develop a public health classification for Australia, and is depicted below.

Functions			
Primary	Assess health of populations Protect from threats to health, disability and injury Promote health and prevent disease		
Instrumental	Ensure public health capability Build the evidence base for public health		
Methods	Advocacy and lobbying Communicable disease control Community action Community development Counselling Diagnosis Directed investment Environmental monitoring Epidemiological methods Exercise of capabilities Food safety Health education	Health impact assessment Immunisation Infection control Legislation and regulation Lifestyle advice Management of biological risk Monitoring and surveillance Personal skills development Political action Public policy development Radiation safety Remediation of environment	Research and evaluation Road safety Screening to detect disease/risk factors Social action Social marketing Training and workforce development Treatment Urban planning Vector control Waste management Other methods of intervention

Source: NPHP 2006.

Cancer-screening services

For breast, cervical and bowel cancers, there is evidence that illness and death can be reduced through population-based screening for early-as-possible detection and effective follow-up treatment. This has led to national screening programs for breast cancer (via mammography) and cervical cancer (via Pap smears). These programs, described below, are called BreastScreen Australia and the National Cervical Screening

Program. They provide screening services that are free to women in the target age group (for breast screening) or are eligible for a Medicare rebate (for cervical screening). Pilot studies of a population-based screening program for bowel cancer were completed in 2004, leading to the National Bowel Screening Program scheduled to begin in mid-2006.

BreastScreen Australia

The BreastScreen Australia program is jointly funded by the Australian and state and territory governments. It comprises a network of dedicated screening and assessment services throughout metropolitan, rural and remote areas of all Australian states and territories; these services can be fixed or mobile. They provide free two-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 its absence. The program is aimed specifically at women aged 50–69 years without symptoms, although women aged 40–49 years and 70 years or over may use the screening service. All may attend without a doctor's referral. Recruitment and reminder systems are used to promote screening and rescreening among women in the target group once every two years.

The proportion of women in the target age group who were screened under the BreastScreen Australia program in a two-year period rose from 52% in 1996–1997 (the first period for which national data are available) to 57% in 2000–2001, before falling slightly to 56% in 2002–03 (Table 7.1).

Table 7.1: Women screened by BreastScreen Australia, two-year periods, 1996–1997 to 2003–2004

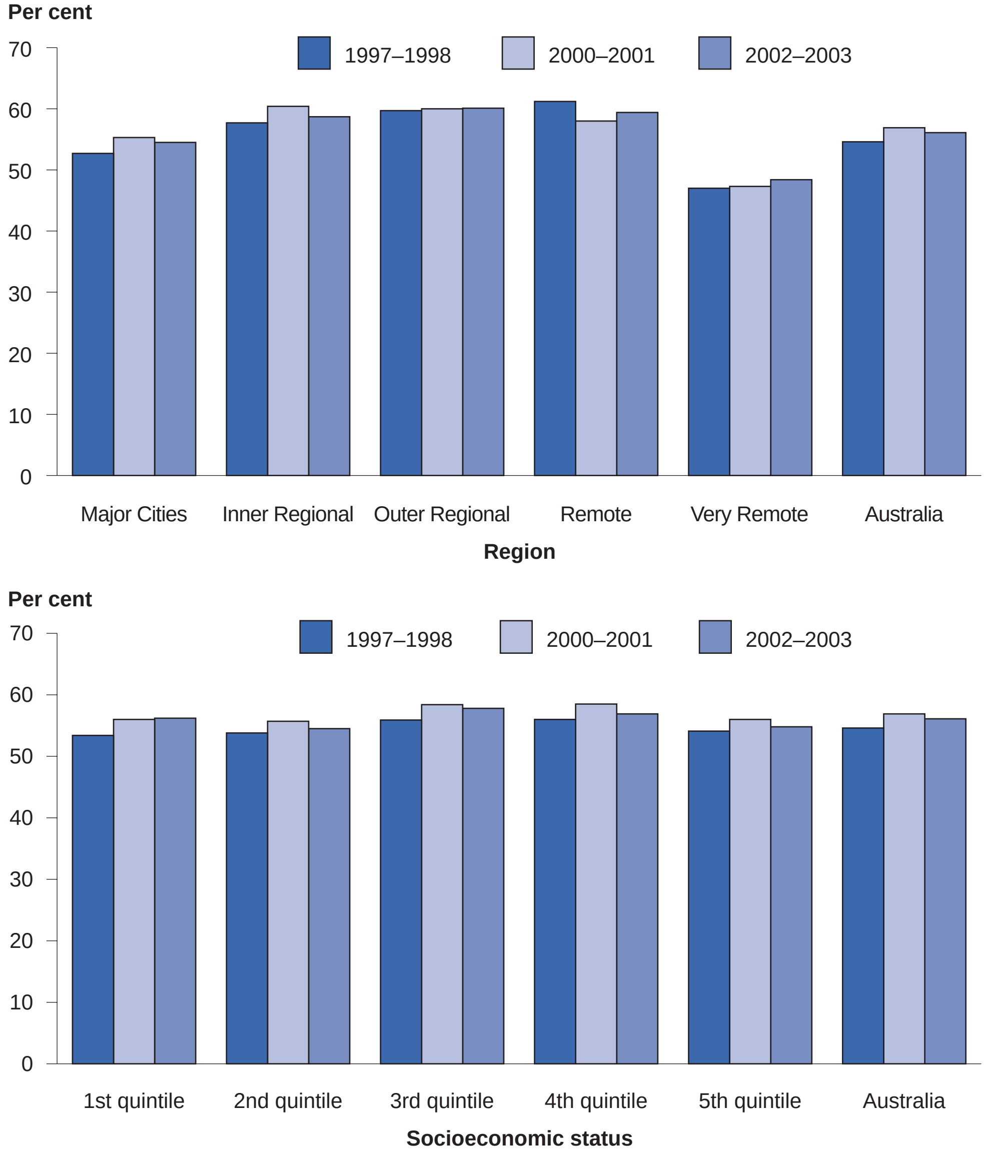
Measure	1996–1997	1998–1999	2000–2001	2002–2003
Target population (ages 50–69)	844,600	975,300	1,063,500	1,118,400
Participation rate for target population (%)[(a)]	52.3	55.6	56.9	56.1

(a) Participation rates are age-standardised to the relevant 2001 Australian population.

Source: AIHW analysis of state and territory BreastScreen Australia data.

Participation rates for women in the target age group varied significantly between geographic regions in 1997–1998, 2000–2001 and 2002–2003 (Figure 7.1). In 2002–2003 the rates in Major Cities (55%) and in Very Remote areas (48%) were statistically significantly lower than the national rate (56%). The Inner Regional, Outer Regional and Remote areas had statistically significantly higher rates than the national rate (59%, 60% and 59% respectively). The higher participation rates in remote areas may reflect the use of mobile BreastScreen services in these areas.

Between the periods 1997–1998 and 2002–2003 there were statistically significant increases in participation in all socioeconomic categories, but in 2002–2003 there were no clear trends in participation across these categories. Participation rates for women living in postcodes in the first (highest), third and fourth socioeconomic quintiles were higher than the national average (56%, 58% and 57% respectively), while the rates for those in the second and fifth (lowest) quintiles were lower than the national average. This suggests that a link between socioeconomic status and BreastScreen participation is either very weak or does not exist.



Notes

1. Rates are the number of women screened as a percentage of the target population and age-standardised to the Australian population at 30 June 2001.
2. Periods cover 1 January 1997 to 31 December 1998, 1 January 2000 to 31 December 2001 and 1 January 2002 to 31 December 2003.
3. The Australian Standard Geographical Classification (ASGC) was used to create the above categories (ABS 2001).
4. The first quintile corresponds to areas with the highest socioeconomic status and the fifth quintile corresponds to the lowest.

Source: AIHW analysis of BreastScreen Australia data.

Figure 7.1: Participation of women aged 50–69 years in BreastScreen Australia, 1997–1998, 2000–2001 and 2002–2003

National Cervical Screening Program

Screening to detect abnormalities of the cervix has been available for Australian women since the 1960s, although in the early years it was largely unstandardised, with no national agreement on the screening target group or the best interval between screens. However, it has since become more organised and in 1995 the program became known as the National Cervical Screening Program. The 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.

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 approximately 80% of Pap smears being performed by general practitioners (GPs). In rural and remote areas, a practice nurse may take the Pap smear on behalf of a medical practitioner. Women may claim Medicare rebates for their Pap smear and any subsequent diagnostic follow-up services. Cervical screening is funded mainly by Medicare (61%) with the remainder funded by Australian Government contributions through special purpose payments to state and territory governments (23%) and these governments' own revenue sources (16%).

Cervical cytology registries operate in all states and territories. The major functions of the registries are to:

- remind women to attend for screening
- ensure the follow-up of women with abnormal Pap smears
- provide cervical screening histories to laboratories and clinicians to aid reporting and management
- monitor the effects of initiatives to improve participation by women in screening.

The Australian recommendation is for all women who have been sexually active at any stage in their lives to have a Pap smear every two years until they reach the age of 70 years. Screening may cease at the age of 70 for women who have had two normal Pap smears within the last five years. Women over 70 years who have never had a Pap smear or who request one are also eligible to be screened. However, for reporting purposes the target group is taken to be all women aged between 20 and 69 years who have not had a hysterectomy.

The proportion of target-age women who were screened under the national program in a two-year period changed little between the periods 1996–1997 and 2002–2003 (Table 7.2).

Table 7.2: Women screened by National Cervical Screening Program, two-year periods, 1996–1997 to 2002–2003

Measure	1996–1997	1998–1999	2000–2001	2002–2003
Target population (ages 20–69)	2,563,100	2,716,400	3,262,900	3,318,400
Participation rate for target population (%)(a)	60.8	63.4	61.0	60.7

(a) Participation rates are age-standardised to the relevant 2001 Australian population.

Note: 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.

National Bowel Screening Program

The Bowel Cancer Screening Pilot Program ran between November 2002 and June 2004 at three sites: Melbourne, Adelaide and Mackay (Queensland). The pilot program achieved participation rates ranging from almost 40% in Melbourne to 57% in Mackay, resulting in an overall participation rate of 45% (Table 7.3).

Table 7.3: Bowel Cancer Screening Pilot participation rates (per cent), June 2004

Measure	Mackay	Adelaide	Melbourne	All sites
Participation rate	57.5	46.3	39.9	45.4
95% CI	56.0–58.9	45.4–47.3	39.1–40.6	44.9–46.0

Notes

1. The rates are an estimate of the proportion of people invited to screen who returned completed FOBT kits by 78 weeks after their invitation, estimated using the Kaplan-Meyer method. 78 weeks is the longest period for which all three sites contributed data. However, those sites that continued beyond 78 weeks showed an increase in participation rate of less than one percentage point.
2. All differences between the rates for the different pilot sites are statistically significant after adjusting for age, sex, test kit type and time between the start of the pilot and the date the invitation to screen was sent.

Source: DoHA 2005a.

The final evaluation report of the pilot showed that a national program would be feasible, acceptable and cost-effective. Consequently, in 2005 the Australian Government initiated a National Bowel Cancer Screening Program to be phased in over a number of years, starting in mid-2006. Initially, screening using faecal occult blood tests (FOBTs) will be offered to Australians turning 55 or 65 years of age between 1 May 2006 and 30 June 2008, and to those who participated in the pilot program. An FOBT is a test for a tiny amount of blood in the faeces which may be due to a cancer or a pre-cancerous polyp in the bowel. Participants with a positive result will be advised to contact their GP for clinical assessment and, if appropriate, referral for further tests (usually a colonoscopy). An evaluation of the national program will be completed in mid-2008 with the aim of extending bowel cancer screening, if successful, to all Australians 55 years of age or over.

Although the participation rates in the Australian pilot program were slightly lower than the rates reported in the major overseas trials, the greater sensitivity of the FOBT used in the Australian pilot should result in the Australian program achieving mortality reductions at least comparable with those of the other trials, that is, reductions in death rates from bowel cancer of between 15% and 33% over a period of 10–14 years.

Immunisation services

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 of contracting vaccine-preventable diseases. For the diseases listed on the National Immunisation Program Schedule (NIPS), free vaccines are funded by the Australian Government, and distribution and administration are the responsibility of the states and territories.

Childhood vaccinations

For many years the NIPS has covered diphtheria, tetanus, pertussis (whooping cough), polio, measles, mumps, rubella and *Haemophilus influenzae* type b (Hib). In 2003 meningococcal type C disease was added and, from 2005, varicella (chickenpox), pneumococcal disease and hepatitis A.

Nationally, the vast majority of childhood vaccinations are delivered in general practice, being the dominant provider in the six states (Table 7.4). However, in the two territories the bulk of vaccinations are administered through community health centres, and in Victoria nearly half are administered through local government councils.

Table 7.4: Immunisation episodes, 2004–05

Provider type	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust[(a)]
General practice	1,234,700	595,300	781,000	276,300	203,100	86,600	28,200	2,100	3,207,200
Local government council	70,700	473,200	63,500	23,300	52,900	10,200	—	—	693,800
Community health centre	118,700	11,300	62,900	71,600	41,000	1,000	45,900	50,400	403,000
Hospital	19,300	7,100	25,600	20,600	2,200	200	400	4,900	80,500
Aboriginal health service or worker	7,500	2,100	11,800	3,100	1,500	—	100	7,700	33,900
State/territory health department	—	—	100	32,200	400	—	—	1,000	33,700
Other	500	400	2,500	—	200	—	—	—	3,600
Total	**1,451,400**	**1,089,400**	**947,400**	**427,100**	**301,300**	**98,000**	**74,700**	**66,600**	**4,456,200**

(a) Includes Cocos/Keeling Island, Christmas Island, Norfolk Island and unknown; therefore rows do not add to the 'Australia' column.

Source: Medicare Australia 2005.

Adult vaccinations

For adults, influenza and, since 2005, pneumococcal vaccines are available free of charge to all Australians aged 65 years or over, to Indigenous Australians aged 50 years or over, and to medically at-risk younger Indigenous Australians.

For those in the main target group who were vaccinated in 2004, over 98% received their influenza vaccination from a doctor or GP. However, for those aged under 65 years who were vaccinated, about two-thirds received their vaccination from a GP, and 27% received it from someone at their place of work.

Incentives to vaccinate

A number of incentives aim to help Australia reach and maintain national vaccination targets. On the provider side, the General Practice Immunisation Incentives scheme comprises 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
- an outcomes payment paid to 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 who are immunised.

Further, the Medicare Benefits Schedule (see Box 7.2) now includes an item for practice nurses to provide an immunisation on behalf of a GP. The item covers the administration of all vaccines on the NIPS.

For parents and carers there is the Maternity Immunisation Allowance, payable in relation to children from 18 months of age when all 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.

Other public health activities

As noted above, public health interventions operate at a number of levels, in a variety of settings, using a range of methods. The activities outlined below are just a small sample of the public health interventions that occur in Australia.

Action against smoking

Australia has achieved world-leading low levels of tobacco use (see Chapter 3), largely attributable to multi-faceted tobacco control activities that employ a large number of the public health methods listed in Box 7.1. These have developed over recent decades as a result of interaction between health professional groups, voluntary health agencies, health activists and all levels of government.

The main principles for reducing tobacco use are contained in the World Health Organization's Framework Convention on Tobacco Control (FCTC), which came into force in February 2005. The FCTC was negotiated by 192 WHO member states and unanimously adopted by the 56th World Health Assembly in May 2003. Australia played a leading role in the negotiations and is a strong supporter of the Convention. The FCTC is binding international law for the first 40 Contracting Parties to the Convention, including Australia.

The objective of the FCTC is to protect present and future generations from the health, social, environmental and economic consequences of tobacco consumption and exposure to tobacco smoke. Provisions in the Convention set international standards on tobacco price and tax increases, tobacco advertising and sponsorship, regulation of tobacco products, tobacco product disclosure, packaging and labelling, education, communication, training and public awareness, cessation measures, illicit trade, sales to minors, support for economically viable alternatives, liability issues, and scientific and technical cooperation and exchange of information.

Australia is well advanced in its legislative and regulatory environment consistent with the Convention. For example, Commonwealth legislation prohibits smoking on aircraft, interstate trains and federally-registered motor coaches, and in most airports. Complementary state legislation variously prohibits smoking on public transport and in taxi cabs, in enclosed public places (such as shopping centres and theatres) and in restaurants. A smoke-free work environment policy is also implemented throughout the Australian Public Service and Australian Government-controlled buildings.

Other legislation and regulations affect the prices of tobacco products (mainly through excise), how products can be displayed and advertised, and the nature and size of health warnings on tobacco packaging.

Other components of the tobacco control effort include organised cessation services (notably the Quit programs), pharmaceutical aids to quitting, campaigns to improve retailers' compliance with regulations, school-based education programs, and mass media campaigns to prevent the uptake of smoking and encourage quitting.

GPs helping with lifestyle

The Lifescripts initiative aims to make it easier for GPs to encourage patients to tackle lifestyle risk factors (such as smoking, poor nutrition, alcohol misuse, physical inactivity and unhealthy weight). A Lifescripts Resource Kit was produced in mid-2005 and is being disseminated with associated training to general practices through the Division of General Practice (Divisions) network.

Participation is on an opt-in basis by Divisions and individual general practices. To date, 70% of Divisions across Australia have indicated they will be promoting Lifescripts to their practices. By early 2006 more than 3,500 resource kits had been ordered, and promotion of the initiative is continuing.

Preparing for a flu pandemic

Since avian influenza (bird flu) broke out in late 2003, a significant focus in Australian health policy has been on preparing a response plan to a pandemic outbreak among humans. The interim Australian Management Plan for Pandemic Influenza June 2005 was developed—consistent with WHO guidelines—to build national preparedness and capacity for an immediate and effective response to any pandemic alert.

The plan is for the wide range of people who will be involved in planning and responding to an influenza pandemic: health planners, public and clinical health care providers, state and territory health departments, essential service providers, border workers and those involved in the media and communications. It aims to provide national guidance for stakeholders in developing and implementing responses across the public and private sectors at all levels.

Two major strategies will be used in Australia with the primary aim of minimising the morbidity and mortality associated with a pandemic event:

- Containment: preventing transmission and spread by border control measures, isolation of the sick, quarantine of contacts, and judicious use of antiviral medication. Containment effectively 'buys time' to enable a suitable vaccine for the pandemic strain to be manufactured.
- Maintenance of essential services. If there is widespread infection within the general population, containment may not be possible. The strategy will shift to an emphasis on maintaining essential services (which include health services, emergency services, power, water and telecommunications, and production of the pandemic vaccine).

The plan is currently under review, with a revised plan expected to be issued in mid-2006.

Lowering the risks for injecting drug users

Needle and syringe programs aim to reduce the transmission of infections—such as HIV and hepatitis C—that arises from the shared use of injecting equipment. The programs offer a range of services to injecting drug users that include provision of free or affordable sterile injecting equipment and disposal facilities, education and information on reducing drug-related harm, referral to drug treatment, medical care, and legal and other social services.

Needle and syringe programs operate in all states and territories of Australia, although their nature varies in terms of:

- being run by government or non-government organisations
- operating as primary outlets (specifically established as stand-alone needle and syringe programs) or operating as secondary outlets (incorporated into other health services such as community health centres)
- operating as mobile or outreach services, or making needles and syringes available through vending machines. Needles and syringes may also be available through pharmacies, either on a commercial basis or through a government-funded scheme.

Currently, an estimated 32 million needles are distributed each year by needle and syringe programs in Australia.

Reducing the road toll

The safety of the road transport system directly affects the level of injuries and deaths in Australia: in the 12 months to September 2005 there were 1,619 road deaths nationally, corresponding to about 1.2% of total deaths. Yet most of the actions to improve road safety are traditionally not carried out within the health system.

The National Road Safety Strategy 2001–2010 provides a framework for coordinating the road safety initiatives of federal, state, territory and local governments, and of others capable of improving road safety. The strategy's target is to reduce the annual number of road fatalities per 100,000 population by at least 40% over a decade, from 9.3 in 1999 to no more than 5.6 in 2010 (ATC 2000).

The current biennial action plan for the strategy highlights the *Safe System* concept, which emphasises how different elements of the road transport system combine and also interact with human behaviour to influence the rate and severity of traffic accidents. The key components of this approach are safer roads and roadsides, safer speeds and safer drivers.

Some of the outcomes achieved under the previous action plan include:

- a default speed limit of 50 km/h in built-up areas, which was incorporated into the Australian Road Rules
- combined red light/speed cameras, which were introduced or extended in some states and territories
- alcohol interlock (a device which prevents the vehicle's engine starting if the driver's blood alcohol level is too high) schemes, which were introduced or trialled in several states and territories.

7.2 Medical services

Seeing a doctor is a very common health-related action in Australia: the 2004–05 National Health Survey shows that, over any two-week period, 23% of the population visited a doctor (ABS 2006). Further, administrative data from Medicare—Australia's universal health insurance system (see Box 7.2)—suggest that around 85% of the population see a doctor at least once in a year (Medicare Australia 2005).

Box 7.2: 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 GP and, for certain services, eligible dentists and allied health practitioners. All Australian residents are eligible for Medicare, except diplomats from other nations and their dependants. 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.

Medicare has established a schedule of fees for medical services provided by private practitioners. The 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 incentives are paid. 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.

Some types of medical services do not qualify for Medicare benefits. These include services provided to entitled war veterans and their dependants by the Department of Veterans' Affairs. Interim Medicare benefits may be paid for services for which claims may be lodged under motor vehicle third-party insurance and workers compensation schemes. These benefits are recovered by Medicare Australia when claims are settled. Other services which do not qualify for Medicare benefits include those provided by public authorities and most government-funded community health services, as well as services considered not necessary for patient care (for example, examinations for employment purposes and cosmetic surgery). To attract benefits, services must be 'clinically relevant', that is, reasonably required for the treatment of the patient's condition.

For private patients who are admitted in 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 $61.50 (from 1 January 2006), indexed annually. Patients are also responsible for payments of amounts charged above the schedule fee.

Further measures take account of 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 $335.50 (from 1 January 2006), indexed annually. Thereafter, patients are reimbursed 100% of 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 ($500 for families in receipt of Family Tax Benefit Part A and for concession card holders, or $1,000 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 hospital care for all eligible Australians, either as an admitted patient, outpatient or emergency department patient at public hospitals. 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.

Medicare services

Medicare data provide an overview of 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 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
- incentives for general practices to bulk-bill (see below) Commonwealth concession card holders and children aged under 16 years.

In the 12-month period 2004–05, an average 11.7 services per Australian were provided under Medicare (or 10.5 services if pathology collection items—which cover the administrative costs of collecting pathology specimens—are excluded). These services included 4.9 *Unreferred medical attendances* (that is, GP services, emergency attendances after hours, other prolonged attendances, group therapy, and acupuncture), 1.0 *Specialist attendances* and 3.9 *Pathology items* (Table 7.5).

Medicare provided benefits for 236.3 million services, representing an increase of 4.4% over the 226.4 million services in 2003–04 (Table S53). Among other things, this increase was due to the effects of population growth (1.1%) and an overall increase in the number of items per person (3.1%) (DoHA 2006).

Table 7.5: Medicare items processed, 2002–03 to 2004–05

	Items per person (number)				Items in 2004–05	
Broad type of service	**2002–03**	**2003–04**	**2004–05**	**Average annual change (%)**	**Number ('000)**	**Proportion of total (%)**
Unreferred medical attendances[(a)]	4.91	4.82	4.86	–0.5	98,200	41.5
Practice nurse	. .	0.06	0.13	. .	2,700	1.1
Allied health	. .	. .	0.01	. .	300	0.1
Specialist attendances	1.02	1.02	1.03	0.6	20,800	8.8
Obstetrics	0.07	0.07	0.07	–1.5	1,400	0.6
Anaesthetics	0.10	0.10	0.10	1.2	2,000	0.8
Pathology	3.57	3.69	3.85	3.8	77,700	32.9
Diagnostic imaging	0.67	0.67	0.70	2.2	14,100	6.0
Operations	0.32	0.33	0.34	3.1	6,900	2.9
Assistance at operations	0.02	0.02	0.02	3.0	300	0.1
Optometry	0.23	0.24	0.25	4.5	5,100	2.2
Radiotherapy and therapeutic nuclear medicine	0.03	0.04	0.04	6.0	800	0.3
Miscellaneous	0.22	0.22	0.23	3.1	4,700	2.0
Total	**11.21**	**11.33**	**11.69**	**2.1**	**236,300**	**100.0**
Pathology collection items[(b)]	1.09	1.12	1.16	2.9	23,400	9.9
Total excluding pathology collection items	**10.11**	**10.21**	**10.54**	**2.1**	**212,900**	**90.1**

(a) Includes general practitioner attendances, emergency attendances, attendances after hours, other prolonged attendances, group therapy and acupuncture.

(b) Covering the administrative costs associated with the collection of specimens.

. . Not applicable.

Sources: DoHA 2006; Medicare Australia 2005.

Benefits paid

In 2004–05, a total of $9,923 million was paid in Medicare benefits, of which $3,321 million (34%) was for 101 million (42.6%) *Unreferred medical attendances* (including *Practice nurse* items). A further $1,483 million (16%) was paid for 14 million (6%) *Diagnostic imaging* services; $1,522 million (15%) for 78 million (33%) *Pathology* items; and $1,212 million (12%) for 21 million *Specialist attendances* (Table 7.5, Table S53).

To avoid double-counting, the bulk-billing incentive items are not counted in 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 S53), while the bulk-billing incentives for other services (including attendances) are included in *Miscellaneous*. This adds $96.5 million in 2003–04 and $317.3 million in 2004–05 to the total for *Miscellaneous* that might otherwise be allocated to the service types for which the bulk-billing incentive was paid.

While some of the growth in Medicare use over the past three years can be attributed to the new items, most types of service have increased or remained relatively stable, with slight decreases in *Obstetrics* (–1.5%) and in *Unreferred medical attendances* (–0.5%) being the only declines. *Radiotherapy* and *Therapeutic nuclear medicine* had the largest percentage increase (6%) but *Pathology* showed the largest numeric increase per person (0.28 services per person).

The number of services used per person varies considerably. For example, in 2003–04, 3.5% of the population received 51 or more services each, and these accounted for 26.0% of total benefits paid. Almost one-third of the population received 1–5 services per person, accounting for 15.6% of the total benefits (Table S56).

There was a moderate change in the average number of unreferred and specialist consultations per person over the period 1984–85 to 2004–05. The rates peaked in 1995–96, declined steadily to 2003–04 and then increased again in 2004–05 (to rates of 5.0 and 6.6 per person for males and females respectively).

Bulk-billing

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.

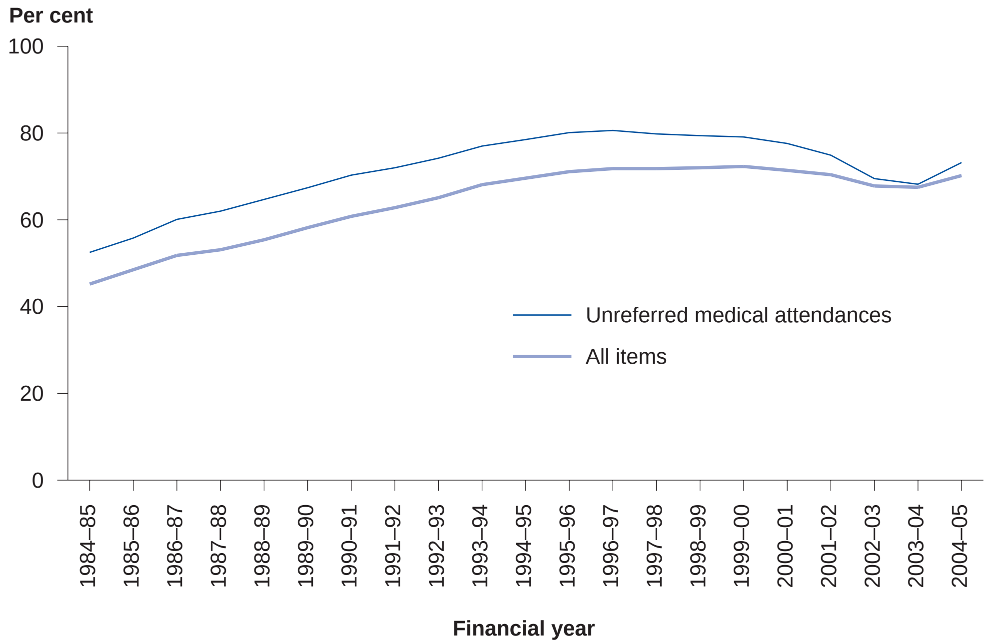
The trend in bulk-billing has followed a similar pattern to overall service use throughout this period, although the peak is observed slightly later: rates across all items increased from 45.2% in 1984–85 to a high of 72.3% in 1999–2000, decreased to 67.5% in 2003–04, and rose to 70.2% in 2004–05 (Figure 7.2). Bulk-billing rates for unreferred medical attendances increased from 52.5% in 1984–85 to a high of 80.6% in 1996–97, fell to 68.2% in 2003–04, and rose to 73.2% in 2004–05.

Geographic variation in the use of Medicare services

Variations in the use of Medicare services occur among the states and territories. In 2004–05, the highest number of services per person (on an age-standardised basis) was recorded in New South Wales with 12.2 services, followed by Queensland (11.5) and Victoria (11.4). The Northern Territory recorded the lowest per-person use of medical services with 7.6 (Table S55). However, this is partly offset by services being provided to Aboriginal and Torres Strait Islander peoples through programs other than Medicare, and these services are not included in the data reported here.

DVA-funded medical services

The Department of Veterans' Affairs (DVA) funds medical services, provided by local medical officers (GPs who are registered with DVA) and specialists, for eligible



Note: Unreferred medical attendances include general practitioner services, emergency attendances after hours, other prolonged attendances, group therapy and acupuncture, but excludes practice nurse items.

Source: DoHA 2006.

Figure 7.2: Bulk-billing rates for all Medicare items and for unreferred medical attendance items, 1984–85 to 2004–05

veterans, war widows/widowers and their dependants. A gold health card is issued to veterans who are entitled to the full range of health care services funded by DVA. A white health card is issued to veterans who are eligible only in relation to conditions arising from active service.

The number of medical services provided decreased by 2.9% from 12.6 million in 2003–04 to 12.3 million in 2004–05. The proportion of the treatment population (316,000 at 30 June 2005) who used medical services in 2004–05 was 97.6%, an increase from 95.9% in 2003–04.

General practice activity

Although the Medicare and DVA data provide a comprehensive view of the volume of general practice services, they shed little light on the reasons patients consult a doctor, or on what doctors do for their patients.

A better understanding of the nature of general practice activity can be gained through BEACH—Bettering the Evaluation and Care of Health (see Box 7.3). This is a continuous study of general practice activity in Australia that collects information on patients and problems managed in general practice and on how GPs manage the problems.

Box 7.3: The BEACH survey of general practice activity

The BEACH (Bettering the Evaluation and Care of Health) study is conducted by the Australian General Practice Statistics and Classification Centre (an Australian Institute of Health and Welfare (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 three 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. Each participating GP uses structured paper encounter forms to give details on 100 consecutive patient encounters, and also provides information about themselves and their practice. Questions about selected patient health risk factors and health states are asked of subsamples of patients.

Why do people see a GP?

The 2004–05 BEACH survey recorded 94,386 encounters, of which 97.4% were direct encounters (that is, the patient was seen face-to-face).

For every 100 encounters there was an average 150 patient reasons for encounter (RFEs) recorded; the RFE is the reason for seeing the doctor as stated or implied by the patient. The most common RFEs were those of a general and unspecified nature (24.4 per 100 encounters). Approximately half related to the respiratory, musculoskeletal, skin, circulatory and digestive systems. The 20 most commonly recorded reasons accounted for 48.1% of all RFEs (Table 7.6). The need for a check-up was the most common (13.4 per 100 encounters), followed by requests for medication or repeat prescriptions (12.2) and for receipt of test results (6.8).

Table 7.6: GP consultations: 20 most frequent patient reasons for encounter, 2004–05

Patient reason for encounter	Per cent of total RFEs	Rate per 100 encounters	Patient reason for encounter	Per cent of total RFEs	Rate per 100 encounters
Check-up	9.0	13.4	Fever	1.2	1.8
Prescription	8.1	12.2	Upper respiratory tract infection	1.2	1.8
Test results	4.5	6.8	Headache	1.1	1.7
Cough	3.9	5.9	Hypertension/high blood pressure	1.1	1.7
Immunisation/vaccination—all	2.9	4.3	Weakness/tiredness	1.1	1.7
Throat complaint	2.4	3.5	Ear pain	1.1	1.6
Back complaint	2.3	3.4	Skin complaint	1.0	1.5
Rash	1.9	2.9	Administrative procedure	1.0	1.4
Abdominal pain	1.3	1.9	Diarrhoea	0.9	1.4
Depression	1.3	1.9	Nasal congestion/sneezing	0.9	1.4

Source: AIHW: Britt et al. 2005.

Since 1998–99 there has been an increase in the rate of RFEs associated with a need for services such as prescriptions and referrals. Visits to obtain the results of tests and investigations have also become more frequent.

Problems managed by GPs

Problems were managed at an average rate of 146 per 100 encounters. Those relating to the respiratory system, musculoskeletal system and skin accounted for almost 40% of all problems managed. The 20 problems most frequently managed accounted for 39.8% of all problems managed. The most common individual problems managed were hypertension (8.9 per 100 encounters), upper respiratory tract infection (5.6 per 100), immunisation/vaccination (4.6 per 100) and depression (3.7 per 100) (Table 7.7).

In light of the ageing of the population and therefore of the average age of the patients encountered, it is surprising there has been no increase in the number of problems managed per encounter: this has remained steady since 1998–99 at around 145 per 100 encounters. However, it is not surprising that there has been an increase in the management rate of chronic problems. One-third of the problems managed in general practice are now chronic in nature. At least one chronic problem was managed at 39% of encounters and they were managed at an average rate of 51 per 100 encounters.

The chronic problems managed most frequently in general practice are hypertension (high blood pressure), depressive disorder, lipid (notably blood cholesterol) disorders, diabetes, osteoarthritis, asthma and oesophageal disease. Together these six chronic problems account for 18% of all problems managed. One in every five problems managed by GPs in Australia remains undiagnosed at the end of the consultation, with the GP describing the problem in terms of a symptom or complaint.

Table 7.7: GP consultations: 20 most frequently managed problems, 2004–05

Problem managed	Per cent of total problems	Rate per 100 encounters
Hypertension	6.1	8.9
Upper respiratory tract infection	3.8	5.6
Immunisation/vaccination	3.2	4.6
Depression	2.6	3.7
Lipid disorders	2.3	3.3
Diabetes	2.2	3.2
Back complaint	2.0	2.8
Osteoarthritis	1.9	2.8
Acute bronchitis/bronchiolitis	1.7	2.4
Asthma	1.6	2.3
Oesophageal disease	1.4	2.1

Problem managed	Per cent of total problems	Rate per 100 encounters
Prescription	1.4	2.1
General check-up	1.4	2.1
Contact dermatitis	1.3	1.9
Female genital check-up/ Pap smear	1.2	1.8
Anxiety	1.2	1.7
Urinary tract infection	1.2	1.7
Sprain/strain	1.2	1.7
Sleep disturbance	1.2	1.7
Test results	1.0	1.4

Source: AIHW: Britt et al. 2005.

Acute conditions remain common reasons for seeing the GP. In 2004–05, upper respiratory tract infection remained the second most common problem managed in general practice, but its management rate has significantly decreased since 1998–99, there now being an estimated 1.5 million fewer encounters managed by GPs than in 1998–99. Other acute conditions being managed less often include acute bronchitis, sinusitis and tonsillitis.

How do GPs manage the problems?

GPs have available to them a range of management techniques, including advice and counselling, referral to another provider, medications, and investigations. In 2004–05 GPs undertook management activities at a rate of 214 per 100 encounters, or 147 per 100 problems (Table 7.8). The most common treatment was medication alone (37% of problems, at a rate of 101.5 per 100 encounters or 69.8 per 100 problems), followed by clinical treatment alone (for example counselling) (11%) and then medication plus clinical treatment (8%). There was no specific treatment recorded for 13% of problems managed.

The total medication rate (prescribed, supplied and advised for over-the-counter purchase) decreased by about 7% over the period 1998–99 to 2004–05. The decline has been greatest in the rate of prescriptions, which fell by almost 11% to 83 per 100 encounters in 2004–05. Applied to general practice across Australia, this represents an average annual decrease of 2.6 million prescriptions, that is 15.6 million fewer prescriptions given by GPs in 2004–05 than in 1998–99. Note that this is a decrease in the number of occasions a prescription is written and does not consider the number of repeats involved or whether the prescription was filled.

Table 7.8: GP consultations: management activities, 2004–05

Management type	Rate per 100 encounters	Rate per 100 problems
Medications	101.5	69.8
Prescribed	83.4	57.3
Advised over-the-counter	8.1	5.5
GP supplied	10.1	6.9
Other treatments	54.7	37.6
Clinical	39.2	27.0
Procedural	15.5	10.6
Referrals	11.5	7.9
Specialist	7.7	5.3
Allied health	2.7	1.9
Pathology	36.7	25.2
Imaging	8.3	5.7
Total management activities	**213.9**	**147.0**

Source: AIHW: Britt et al. 2005.

Other treatments provided by the GP were classified as clinical or procedural. At least one such treatment was provided for 32.4% of problems. Clinical treatments were more frequent (39.2 per 100 encounters or 27.0 per 100 problems) than procedures (15.5 and 10.6 respectively). General advice and education (7.0 per 100 encounters) was the most common clinical treatment followed by counselling about nutrition and weight. The most frequent procedure was excision or removal of tissue (3.3 per 100 encounters).

At least one referral was given at 10.9% of encounters for 7.9% of problems. Referrals to medical specialists arose at a rate of 7.7 per 100 encounters, the most frequent being to ophthalmologists. Referrals to allied health professionals were made at a rate of 2.7 per 100 encounters, more than one-third being to physiotherapists. Admissions to hospital and referrals to emergency departments were rare. Pathology was ordered for 12.2% of all problems (at a rate of 36.7 tests per 100 encounters), and imaging was ordered for about one in 20 problems, at a rate of 8.3 per 100 encounters.

Provision of advice and counselling is on the increase in general practice, with an estimated 5.4 million more occasions in 2004–05 than in 1998–99. Advice and counselling about nutrition/weight accounts for about 1.5 million of these additional events. An increase in provision of psychological counselling was also found, but the change was smaller.

BEACH suggests that GPs undertook almost 15 million procedures across the country during 2004–05 and that this represents an increase of about 460,000 procedures per year since 1998 (that is, an extra 2.8 million procedures in 2004–05 compared with 1998–99).

Pathology test ordering by GPs continues to increase, not only in total numbers but also in terms of how often at least one pathology test is ordered. The proportion of encounters generating pathology test orders increased between 1998–99 and 2004–05, from 13% to 16% of encounters. This suggests there were 1.5 million more encounters at which the GP ordered pathology tests in 2004–05 than in 1998–99. Further, the total number of pathology tests ordered increased by almost 25% after 2000–01, from 29.7 per 100 encounters that year to 36.7 in 2004–05. Previous research has demonstrated that in the late 1990s an increase in pathology test ordering was not due to increased likelihood of testing, but to increased numbers of tests ordered at any one time. It appears this is no longer the case, with the data suggesting a combination of these effects. The extrapolated effect of the increase is that Australian GPs ordered 5.2 million more pathology tests in 2004–05 than they did in 2000–01. This increase was particularly apparent in ordering rates for chemical pathology and haematology.

There has also been an increase in the likelihood of GPs ordering imaging tests, but the change was far less than that for pathology. There was no significant change in overall referral rates, or in rates of referral to medical specialists, allied health professionals or hospital services.

Medical indemnity claims

At times incidents arise in health care services where a person decides to pursue a claim against a health professional or organisation on the basis that the person has suffered some kind of harm.

There has been increasing policy concern about the costs associated with health care litigation and the financial viability of medical indemnity insurers in Australia. This has drawn responses on a number of fronts, including:

- a range of Australian Government initiatives to help either with the affordability of medical indemnity insurance, or to cover some of the cost of extraordinary claims

- reforms of the medical insurance market, including bringing medical indemnity insurers under the same regulatory arrangements as general insurers
- continued reforms by the states and territories of tort law and the legal system, in the context of general public liability reforms.

A further response, following a recommendation by health ministers at the Medical Indemnity Summit in 2002, was the establishment of the Medical Indemnity National Collection (MINC), which collates information on the number, nature, incidence and costs of public sector medical indemnity claims.

Although the management of public sector medical indemnity insurance varies across jurisdictions, all health professionals employed by public health agencies (including public hospitals) are indemnified for their public work. Recently, these arrangements have been expanded to cover private medical practitioners in specified circumstances, such as non-salaried doctors treating public patients in public hospitals, or rural GPs working in country health services. In the future, medical indemnity data from both the public sector and private insurers will be compiled into a single collection and national report.

A medical indemnity claim in the context of the MINC is a claim for compensation for harm or other loss as a result of a health care incident in the public sector. A claim is included in the MINC when either legal proceedings have been instigated or the claim is likely to require litigation and has a reserve (that is, the best current dollar estimation of the total cost of the claim) placed against it.

The MINC is a new collection and improvements are continuing in areas of data quality and completeness. The results presented here reflect the availability of data to date, and hence should be interpreted with this in mind.

What claims are being made?

In the period 1 July 2003 – 30 June 2004, almost 5,000 claims were made in the public sector. The clinical service context most frequently recorded in medical indemnity claims data was obstetrics (825 claims, 17% of all claims), accident and emergency (710 claims, 14%), general surgery (561, 11%) and gynaecology (414, 8%) (Table 7.9). The clinical service context is the area of clinical practice or hospital department in which the patient was receiving a health service when the incident occurred.

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 was of primary importance in giving rise to a claim. Procedural-related issues (such as invasive clinical intervention, where there is an incision and/or a body cavity is entered) were the most commonly recorded primary incident or allegation type for all claims (1,627 claims, 33% of all claims). The next most common incident/allegation types were diagnosis (1,028 claims, 21%), treatment (676, 14%) and other general duty of care (512, 10%).

Adults aged 18 years or over accounted for almost three-quarters of claim subjects. Babies under one year and children aged 1–18 years represented a similar proportion of claim subjects: 9% (431 claims) and 8% (413 claims) respectively. Around 58% of all adult claim subjects were female, but males were slightly more common (53%) among baby claim subjects (AIHW 2005a).

Table 7.9: Public sector medical indemnity claims, 1 July 2003 to 30 June 2004

Clinical service context	Primary incident/allegation type						
	Diagnosis	Procedure(a)	Treatment(b)	Other general duty of care	Other(c)	Not known	Total
Obstetrics	93	390	167	40	85	50	825
Accident & emergency	414	41	142	42	47	24	710
General surgery	68	292	47	22	118	14	561
Gynaecology	32	263	20	19	68	12	414
Orthopaedics	68	185	45	17	59	12	386
Psychiatry	37	2	27	126	32	10	234
General medicine	45	11	36	61	43	8	204
Paediatrics	43	33	22	9	23	5	135
All other clinical service contexts	214	393	163	163	293	68	1,294
Not known	14	17	7	13	25	117	193
Total	**1,028**	**1,627**	**676**	**512**	**793**	**320**	**4,956**

(a) 'Procedure' includes failure to perform a procedure, wrong procedure performed, wrong body site, post-operative complications, failure of procedure, and other procedure-related issues.

(b) 'Treatment' includes delayed treatment, treatment not provided, complications of treatment, failure of treatment, and other treatment-related issues.

(c) 'Other' includes medication-related, anaesthetic, blood/blood-product-related, consent, infection control, device failure and other.

Notes

1. The clinical service context categories listed separately are the eight most frequently recorded categories; all other categories are combined in 'All other clinical service contexts'.
2. Data for approximately 80% of all claims in scope are included.
3. As well as the primary incident/allegation type represented in this table, up to three additional categories may be recorded in the MINC, to describe other aspects of 'what went wrong'.

Source: AIHW 2005a.

Finalised claims

A total of 860 claims current during 2003–04 were finalised by 30 June 2004. More than one-third of finalised claims had a total claim size of less than $10,000 (37% or 318 claims). Another 148 claims (17%) had no payment made.

Around 40% of claims were settled out of court, the majority by 'other processes'. Very few claims (42, or 6%) were settled by a court decision and just under half (43%) were discontinued. Of claims with a total claim size exceeding $100,000, 82% (50 claims) were settled out of court, compared with 16% (10 claims) decided in court. Of those discontinued, no payment was received for 33% of claims and 56% resulted in a total claim size of less than $10,000. Around 42% of claims settled by a court decision did not receive any payment.

7.3 Dental services

Unlike medical services, there are no national administrative data on the use of dental services. However, information about dental services is obtained from the National Dental Telephone Interview Survey—most recently conducted in 2002—which asked

Australians aged 18 years or over about their patterns of dental care during the preceding 12 months. The 2002 survey was the fifth in a series conducted since 1994 by the AIHW's Dental Statistics and Research Unit.

Who sees a dentist?

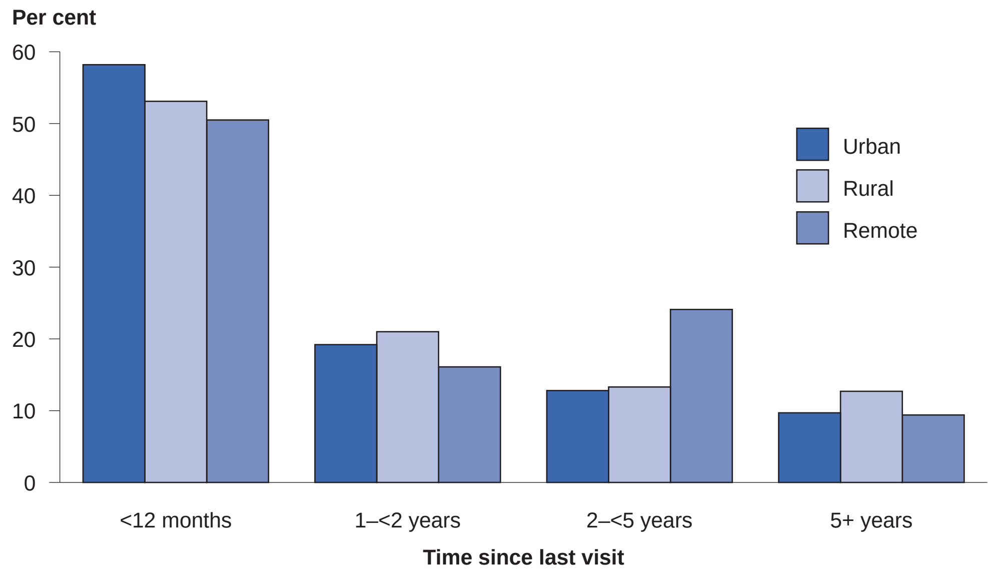
In 2002, 62.5% of Australians who were dentate (that is, who had some or all of their natural teeth) said that they visited a dentist at least once within the preceding 12 months, compared with 15.2% of people who were edentulous (that is, who had no natural teeth). Edentulous people represent 8.3% of the adult population, although the figure ranges from less than 1% among those aged 18–44 years to 43.8% among people aged 75 years or more.

Historically, complete tooth loss was highly prevalent among older Australians, with the consequence that relatively few of them used dental services. However, the prevalence of complete tooth loss halved in the period 1979–2002 and the decline is projected to continue (Sanders et al. 2004). As more older adults retain some of their natural teeth the demand for dental services will therefore increase.

Because complete tooth loss is so strongly associated both with age and patterns of dental visits, the remaining analyses were limited to dentate people.

Geographic variation in dental visits

Urban dwellers were more likely than rural and remote dwellers to have visited a dentist in the preceding year (Figure 7.3). Among adults who made one or more dental



Source: AIHW DSRU 2005.

Figure 7.3: Geographic variation in time since last dental visit among dentate adults aged 18 years or over, 2002

visits within the preceding year, most (80.2%) attended a private dental practice, with the remainder using public dental services funded by state or territory governments. The likelihood of visiting a private dental practice was greater in urban (86.7%) and rural (82.2%) than in remote areas (73.0%).

There was additional geographic variation in the types of dental services provided: rural dwellers were somewhat more likely than urban and remote dwellers to report that they had a tooth extracted in the last year. People living in remote areas were less likely to have had a filling than people in urban or rural areas. When people were asked if they usually visited the dentist for a check-up or because of dental problems, 59% of those in rural and remote areas said it was for dental problems, compared with 45% in urban areas.

7.4 Use of medications

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 (233 million prescriptions filled in 2004), over-the-counter medications such as analgesics (pain-killers) and cough medicines ($1.7 billion spent in 2003–04), or vitamins, minerals, and natural and other complementary medications ($0.8 billion spent in 2004), this is an important component of the health system, accounting for over 14% of recurrent health expenditure in 2003–04.

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 2005, there were 4,922 approved community pharmacies and friendly societies in Australia (DoHA 2005b).

Prescribed medicines

Information on the supply of prescription medicines in the community is compiled by Medicare Australia (formerly the Health Insurance Commission). 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 7.4). Estimates of the use of non-subsidised prescription medicines are calculated 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.

In 2004–05, there were 170 million community PBS prescriptions—28 million for general patients and 142 million for concessional patients (Medicare Australia 2005). This was an increase of 2.7% over the 166 million in 2003–04 and 7.4% over the 148 million in 2000–01. Additionally, there were 16 million RPBS prescriptions in 2004–05 and 0.4 million PBS doctors bag prescriptions (that is, emergency drugs that the doctor can provide to patients free of charge).

In 2003–04 there were about 42 million prescriptions which did not attract a subsidy (27 million below the co-payment threshold and about 15 million private prescriptions, that is, prescriptions for drugs not covered by the PBS or RPBS.

Box 7.4: The Pharmaceutical Benefits 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 2005, the scheme covered 804 drug substances (generic drugs), available in 2,138 forms and strengths (items) and marketed as 3,659 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, 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, safety and cost-effectiveness compared with other treatments. Once a medicine has been recommended by the committee, 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 listing is then considered by the Australian Government.

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 2006 general patients pay the first $29.50 for each prescription item. Concessional patients (people with low incomes and sickness beneficiaries who hold a health care card) make a co-payment of $4.70 per prescription item. These co-payments are increased on 1 January each year. Most increases are an adjustment in line with Consumer Price Index increases, but the increase on 1 January 2005 was from $23.70 to $28.60 for general patients and from $3.80 to $4.60 for concessional patients. This increase was in accord with Australian Government legislation changes.

Individuals and families are protected from large overall expenses for PBS-listed medicines by safety nets. Once a general patient and/or immediate family has spent $960.10 in a calendar year, the patient co-payment per item decreases to the concessional rate of $4.70 per item. For concessional patients, the $4.70 co-payment is not required once their expenditure on PBS items exceeds $253.80 in a calendar year. These figures apply for the 2006 calendar year.

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.

The impact of co-payments on demand for prescriptions is hard to assess. A Commonwealth Fund telephone survey in 2004 found that 12% of Australians interviewed said that in the last 12 months they did not fill a prescription or skipped doses because of cost. This compares to 21% of US citizens, 9% of Canadians and 4% of British citizens responding the same way (Commonwealth Fund 2005).

Trends in prescribed medicines

There has been a steady increase in the total number of community prescriptions, from 166 million in 1994 to 233 million in 2004 (Table 7.10), representing an average growth every year of 3.5% or a total growth over the period of 41%. The growth in the number of PBS/RPBS scripts is less regular than the growth in overall scripts because of variations in the co-payment schemes over the years. The PBS/RPBS scripts went from 72% of total community scripts in 1994 to 80% in 2004, while scripts below the co-payment threshold went from 20% of the total in 1994 to 12% in 2004. PBS/RPBS scripts increased by 55% in the period, compared with a decline of 17% in scripts below the co-payment level.

Table 7.10: Number of community prescriptions, 1994–2004

	Year						Change
Type	**1994**	**1996**	**1998**	**2000**	**2002**	**2004**	**1994 to 2004**
	(Million)						(%)
PBS concession	97.0	105.8	107.3	120.5	132.3	140.8	45
PBS general	17.2	18.5	18.8	21.8	25.2	29.5	71
RPBS	5.4	8.7	10.2	12.5	15.0	15.7	189
PBS/RPBS total	**119.6**	**133.0**	**136.4**	**154.8**	**172.5**	**186.0**	**55**
Private	11.6	11.7	12.6	13.3	16.0	18.1	56
Under co-payment	33.9	34.1	37.9	31.7	27.6	28.2	–17
Other	0.8	0.8	0.8	0.5	0.5	1.0	27
Total	**165.9**	**179.6**	**187.6**	**200.3**	**216.6**	**233.4**	**41**

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 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 measures assume, however, that the amount of medicines supplied is the same as the amount used, and that will not always be the case.

In 2004–05, atorvastatin (used for lowering blood cholesterol) was the most commonly-used drug measured by DDD/1,000/day (Table 7.11), followed by simvastatin (also for lowering blood cholesterol) and ramipril (for treating chest pain and high blood pressure). The top three generic medications by prescription volume in 2004–05 were atorvastatin and simvastatin (8.1 million and 6.3 million prescriptions respectively), followed by paracetamol (a pain-killer, 4.9 million prescriptions) and amoxycillin (an antibiotic, 4.9 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 on 2.5 million occasions (50.6%).

Table 7.11: Top 15 generic medications, 2004–05

		Defined daily dose per 1,000 population			Prescriptions ('000)		
Generic name	Action	PBS/ RPBS[(a)]	Other[(b)]	Total	PBS/ RPBS	Other	Total
Atorvastatin	Lowers blood cholesterol	98.2	0.2	98.4	8,075	19	8,095
Simvastatin	Lowers blood cholesterol	56.0	0.1	56.1	6,276	11	6,287
Paracetamol	Pain-killer	11.0	0.2	11.2	4,774	123	4,898
Amoxycillin	Antibiotic	n.a.	n.a.	n.a.	2,406	2,465	4,871
Omeprazole	Lowers gastric acid	20.6	0.1	20.7	4,413	12	4,425
Salbutamol	Opens airways	18.9	7.9	26.7	3,063	1,178	4,241
Atenolol	Lowers blood pressure	9.9	2.7	12.6	3,248	873	4,121
Codeine with paracetamol	Pain-killer	4.9	2.2	7.1	2,693	1,343	4,035
Irbesartan	Lowers blood pressure	20.2	1.3	21.5	3,371	346	3,717
Cefalexin	Antibiotic	n.a.	n.a.	n.a.	2,119	1,516	3,635
Ramipril	Lowers blood pressure	33.8	3.1	36.8	2,903	416	3,320
Perindopril	Lowers blood pressure	12.3	1.5	13.8	2,837	461	3,298
Metformin hydrochloride	Lowers blood glucose	11.3	2.7	14.0	2,661	613	3,274
Irbesartan with hydrochlorothiazide	Lowers blood pressure	n.a.	n.a.	n.a.	2,939	118	3,057
Esomeprazole	Lowers gastric acid	11.5	0.0	11.5	2,984	8	2,992

(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 patient co-payment.

Note: Data relate to prescriptions written by GPs and specialists and then filled at a pharmacy by the patient. Table 7.12, in contrast, refers only to prescriptions written by GPs.

Source: Drug Utilisation Sub Committee drug utilisation database (DoHA, unpublished).

Changes in the use of PBS medications

The use of some prescription medicines has changed markedly over the last few years. For example, between 2000–01 and 2004–05 there was a 185% increase in the DDD/1,000 population/day for ramipril (for lowering blood pressure). Conversely there was a 27% decrease in the DDD/1,000/day for celecoxib (an anti-inflammatory) over this period (Table S34).

Atorvastatin, simvastatin and omeprazole were the highest cost drugs for the PBS in 2004–05, with PBS expenditure on them totalling $508.3 million, $389.0 million and $174.6 million respectively. The next most costly were salmeterol and fluticasone (a combination drug that opens the airways and reduces inflammation, $164.0 million) and esomeprazole (which reduces gastric acid, $157.3 million) (DoHA 2005a). Between 2000–01 and 2004–05, PBS benefits for salmeterol and fluticasone rose by 246%. For atorvastatin and simvastatin benefits paid increased by 92% and 46% respectively.

GP prescribing patterns

The BEACH survey of general practice activity collects information on drugs prescribed by GPs (AIHW: Britt et al. 2005). In 2004–05, medications were prescribed at a rate of 83 per 100 encounters. Antibiotics were the most commonly prescribed group, accounting for 20.9% of all prescriptions. The next most common were cardiovascular medications (15.5%), central nervous system and psychological medications (21.1%), musculoskeletal medications (6.9%) and respiratory medications (6.5%).

Four of the 10 most frequently prescribed medications are from the antibiotic group (Table 7.12). Simple analgesics (pain-killers) 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 7.12: Medications most frequently prescribed by GPs, 2004–05

Generic name	Action	Proportion of prescriptions (%)	Prescriptions per 100 encounters
Amoxycillin	Antibiotic	4.2	3.5
Paracetamol	Pain-killer	3.2	2.7
Cephalexin	Antibiotic	2.9	2.4
Paracetamol/codeine	Pain-killer	2.4	2.0
Amoxycillin with potassium clavulanate	Antibiotic	2.0	1.7
Salbutamol	Opens airways	1.7	1.4
Atorvastatin	Lowers blood cholesterol	1.7	1.4
Temazepam	Sleeping tablet	1.4	1.1
Roxithromycin	Antibiotic	1.4	1.1
Diazepam	Reduces anxiety	1.3	1.1

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. This 'repeats' issue is a reason the order of drugs in this table is different from the order of drugs in Table 7.11.

Source: AIHW: Britt et al. 2005.

Non-prescribed medicines via GPs

The BEACH survey collects and reports information on drugs that GPs advise patients to purchase over the counter, and those that the GPs supply directly.

In 2004–05, 9.9% of medications prescribed, advised or provided by GPs were advised for over-the-counter purchase, and 8.0% were supplied by the GP. Australia-wide, this would represent nearly 10 million recommendations for the purchase of drugs, and almost 8 million supplies of drugs by GPs. Nearly a quarter of drugs (23.1%) advised for over-the-counter purchase were for paracetamol and 5.3% for ibuprofen (an anti-inflammatory drug). The most common medications supplied by GPs were vaccines.

Complementary and alternative medicines

In addition to prescribed pharmaceuticals and other conventional medications, many Australians use a range of complementary and alternative medicines, including homoeopathic, herbal and nutritional medications.

Any product that is regarded as being a therapeutic good must be entered on the Australian Register of Therapeutic Goods before it can be supplied in Australia (with the exception of a few 'exempt' goods). Further, to be *registered*—rather than just *listed* on the register—a product must undergo a scientific evaluation for quality, safety and efficacy.

The 2004–05 National Health Survey asked respondents with selected conditions about the type of medications they used for those conditions. The survey results show that in any two-week period around 40% of people with arthritis and/or osteoporosis used vitamins, minerals and/or herbal treatments for their condition. Lower proportions used these medicines for circulatory conditions (8%), diabetes (4%) or asthma (2%). The survey also reports that in any two-week period around 46% of Australians aged 18 years or over used vitamins, minerals and/or herbal treatments for their mental wellbeing.

A study in 2004 estimated that 58% of women and 46% of men in South Australia had used alternative medicines in the previous year. Most commonly used were non-prescribed vitamins (36% of males and 43% of females), aromatherapy oils (5% and 17%), herbal medicines (16% and 25%) and mineral supplements (11% and 16%) (MacLennan et al. 2006).

Applying these results to Australia, MacLennan and others estimate that total expenditure on complementary and alternative medicines in 2004 was $810 million. This was a decline since the estimated expenditure in 2000 of $1,060 million. This decline may have been due to the Pan Pharmaceuticals crisis of 2003, when the Therapeutic Goods Administration suspended Pan's licence to manufacture. At the time, Pan Pharmaceuticals manufactured 40% of complementary and alternative medicines in Australia (MacLennan et al. 2006).

7.5 Hospital services

Hospitals are a prominent component of the Australian health care system: they account for more than one-third of recurrent health expenditure (more than $27 billion) and arguably attract the most media attention. The hospital sector comprises more than 1,300 hospitals around Australia, with around 80,000 beds available for providing care. The public hospital system employs the equivalent of more than 200,000 full-time staff, almost half of whom 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 volume of *non*-admitted services, such as those provided by emergency departments and outpatient clinics (see Box 7.5 for details on terminology). On a typical day around 19,000 Australians are admitted to a hospital, with about the same number leaving (separating), and there are almost 125,000 non-admitted services.

Box 7.5: 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 they 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 of 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 episode of care, which 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 surgical or non-surgical, and therapeutic or diagnostic. Diagnoses and procedures were reported using the third edition of the ICD-10-AM classification in 2003–04 (see Box 7.6). 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). Data are provided for all public hospital separations and about 95% of private hospital separations for most years.

As indicators of ill health, hospital separations data have limitations. When sick people are attended to by the hospital but not admitted this is 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 one patient admitted five times cannot be distinguished from five patients admitted once each. Finally, hospital separation 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 non-admitted patients 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).

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, collection of more detailed data on clinic type for non-admitted patient care in hospital outpatient clinics began on 1 July 2005 in selected public hospitals.

Distribution and trends in admitted patient care

In 2003–04 there were 6.8 million separations of admitted patients from public acute, public psychiatric and private hospitals—equivalent to one episode for every three Australians (see Tables S26–S33). These separations are shared across the public and private sector in the ratio of about 3:2, with 4.1 million separations from public acute hospitals, around 17,000 from public psychiatric hospitals and 2.6 million from private hospitals (which include private psychiatric hospitals and private free-standing day hospital facilities). These separations accounted for 23.6 million patient days, with a relatively greater share in the public sector: 67% in public acute hospitals, 3% in public psychiatric hospitals and 30% in private hospitals.

In 2002–03 the rate of overnight separations (that is, separations that include at least one night's stay) was in the middle of the range reported by other OECD countries for recent years (AIHW 2005b).

Between 1999–00 and 2003–04, there was an 8.5% increase in separations from public acute hospitals and a 30.3% increase in separations from private hospitals. Increases in patient days over this period were more modest (0.4% for public acute hospitals and 12.6% for private hospitals), meaning that average length of stay has become shorter over this period.

After adjusting for changes in the age structure and size of the population, between 1999–00 and 2003–04 the number of separations per 1,000 population rose by 8.0% overall, due to an increase of 20.8% for private hospitals and 1.5% for public acute hospitals (calculated from Table 7.13). Part of the increase in private hospital activity can be attributed to the growth in the number of private same-day hospitals (see below). The number of patient days per 1,000 population fell by 4.3% overall over the period: this included an overall decrease of 6.9% for public hospitals, but an increase of 2.6% for private hospitals.

Thus there was some shift from the use of public acute to private sector hospitals during the four-year period. In 1999–00, 65.3% of total separations were in public acute hospitals, whereas in 2003–04 this proportion had fallen to 61.2%. There was, however, no change in the proportion of total patient days spent in public acute hospitals (66.7%). Within public acute hospitals, the proportion of patients admitted as public (Medicare) patients (see Box 7.5) remained relatively stable between 1999–00 (87.5%) and 2003–04 (86.8%).

The rise in separations for private hospitals was reflected in increases in the number of separations for a range of treatments or investigations for the private sector between 1999–00 and 2003–04. The greatest increase was for renal dialysis: 71,000 more separations (114.0%). Other relatively large increases were for chemotherapy (53,000 more separations, 58.4%) and colonoscopy (33,000 more separations, 31.4%).

Table 7.13: Hospital use by admitted patients, 1999–00 to 2003–04

Measure/sector	1999–00	2000–01	2001–02	2002–03	2003–04
Separations per 1,000 population[(a)]					
Public hospitals	204.6	201.8	202.6	205.7	207.7
Public acute hospitals	203.7	200.9	201.8	204.8	206.8
Public psychiatric hospitals	0.9	0.9	0.9	0.8	0.9
Private hospitals[(b)]	108.4	119.8	125.1	129.0	130.9
Private free-standing day hospital facilities	15.1	18.1	20.2	23.9	25.1
Other private hospitals	93.5	98.9	104.7	105.1	105.8
Total	*312.3*	*320.2*	*327.7*	*333.5*	*337.2*
Patient-days per 1,000 population[(a)]					
Public hospitals	865.1	820.0	827.8	821.1	804.9
Public acute hospitals	804.2	782.8	775.9	774.7	771.3
Public psychiatric hospitals	60.9	37.1	51.9	46.4	33.6
Private hospitals[(b)]	342.4	356.8	357.0	356.9	351.3
Private free-standing day hospital facilities	15.1	18.1	20.2	23.9	25.1
Other private hospitals	327.4	336.7	334.9	331.8	325.2
Total	*1,205.4*	*1,172.0*	*1,182.5*	*1,175.6*	*1,153.9*
Same-day separations as a percentage of total					
Public acute hospitals	45.8	46.4	47.8	49.0	49.1
Private hospitals	56.1	58.5	60.0	61.4	62.6
Other private hospitals	49.2	51.6	52.8	53.2	54.3
Total[(c)]	*49.2*	*50.8*	*52.3*	*53.7*	*54.3*
Average length of stay (days)					
Public acute hospitals	3.9	3.9	3.9	3.8	3.8
Private hospitals	3.1	3.0	2.9	2.8	2.7
Other private hospitals	3.5	3.3	3.2	3.2	3.1
Total[(c)]	*3.8*	*3.7*	*3.6*	*3.5*	*3.4*
Average length of stay, excluding same-day separations (days)					
Public acute hospitals	6.4	6.4	6.5	6.5	6.4
Other private hospitals	5.9	5.8	5.7	5.6	5.6
Total[(c)]	*6.6*	*6.4*	*6.5*	*6.5*	*6.3*

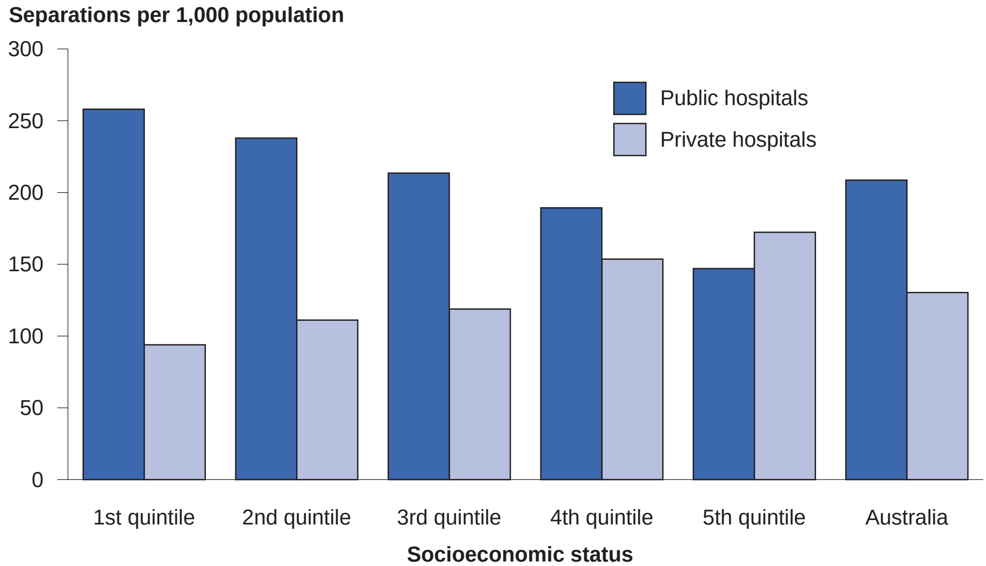
(a) Figures are rates (per 1,000 population) directly age-standardised to the Australian population as at 30 June 2001. For private hospitals, rates were derived using populations of the reporting states and territories only, without adjustment for incomplete reporting.

(b) From 2000–01 to 2003–04 the hospital type was not specified for Tasmanian private hospitals, so data for Tasmania are included in the private hospitals total but not in the private hospital subcategories.

(c) Public psychiatric hospitals and private free-standing day hospital facilities are included in these totals.

Source: AIHW 2005b.

Although the public sector has a larger share of overall hospital activity than the private sector, better-off Australians tend to use private hospitals, while less advantaged people tend to use public hospitals. There is a clear gradient of higher use of public hospitals by residents of areas of greatest socioeconomic disadvantage (258 separations per 1,000 population), compared with the least disadvantaged (147 per 1,000) (Figure 7.4). Conversely, in the private sector the highest separation rates were reported for residents of areas of least disadvantage (172 per 1,000), compared with those of greatest disadvantage (94 per 1,000).



Note: The first quintile corresponds to areas with the lowest socioeconomic status and the fifth quintile corresponds to the highest.

Source: AIHW 2005b.

Figure 7.4: Separations from public and private hospitals, by socioeconomic status, 2003–04

Hospital length of stay

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 (anaesthetics and microsurgery, for example) enabling a wider range of procedures to be performed on a same-day basis (Duckett 2002). Improved drug treatments and efforts to increase hospital productivity have also tended to result in shorter lengths of stay. (Potentially affecting the reporting of increased average length of stay, however, is that some treatments that have previously been undertaken during short-stay admissions are not now included in these data as they are being provided in outpatient clinics and day care facilities or by community health services. This means that the calculated average length of stay, whether increasing or decreasing over time, will still be higher than it would have been previously.)

With public psychiatric hospitals excluded, the average length of stay was 3.4 days overall in 2003–04: 3.8 days in public acute hospitals and 2.7 days in private hospitals (Table 7.13). Excluding same-day separations, the average length of stay was 6.4 days in public acute hospitals and 5.6 days in private hospitals.

The difference between public and private hospitals at least partly reflects the different range of patients cared for and treatments undertaken (casemix) in the two hospital sectors. For example, public hospitals had more children under the age of 5 years as patients (6.2% of separations), compared with private hospitals (2.1% of separations) (Tables S26 and S27). There were also differences in the socioeconomic status of the patient's residential area (described above), 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 decreased from 3.8 days in 1999–00 to 3.4 in 2003–04. If those same same-day separations are excluded, the average length of stay still fell over the period, though less markedly, from 6.6 days to 6.3. These figures are within the range of those reported for other OECD countries.

Same-day separations

In 2003–04, there were 3.7 million same-day separations: 2.1 million from public acute hospitals, around 3,000 from public psychiatric hospitals and 1.7 million from private hospitals. There was a strong upward trend over the period 1999–00 to 2003–04 in the proportion of separations that were day-only. In 1999–00, 49.2% of separations were same-day separations, but by 2003–04 this had increased to 54.3% (Table 7.13).

The number of private free-standing day hospital facilities has risen dramatically over recent years (from 140 in 1995–96 to 234 in 2003–04; Table 7.16), and this is reflected in a relatively large increase in same-day separations from these hospitals between 1999–00 and 2003–04. The number of same-day separations increased by 74.8% for private free-standing day hospitals (excluding Tasmania—see note to Table 7.13), compared with an increase of 35.3% for other private hospitals (excluding Tasmania). More modestly, the number of same-day separations in public hospitals increased by 16.5%.

What problems 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 7.6. Regardless of the classification used, the consistent picture is that a relatively small number of conditions and treatments account for a substantial portion of hospital separations: 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 forth), replacement of the eye's lens (usually because of cataracts), and childbirth (including caesarean sections).

Box 7.6: 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. The classification used in 2003–04 in Australia was the third edition of the International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification (ICD-10-AM) (NCCH 2002). It comprises classifications of diseases and external causes of injuries and poisoning, based on the WHO version of ICD-10, and a classification of procedures known as the Australian Classification of Health Interventions. These ICD-10-AM codes can be a source of information on the diseases treated in hospitals and the operations performed, at very detailed levels or combined into broad groupings.

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 usage 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' (that is, care not involving surgery) and 'other' partitions, and then to the individual AR-DRGs that they comprise.

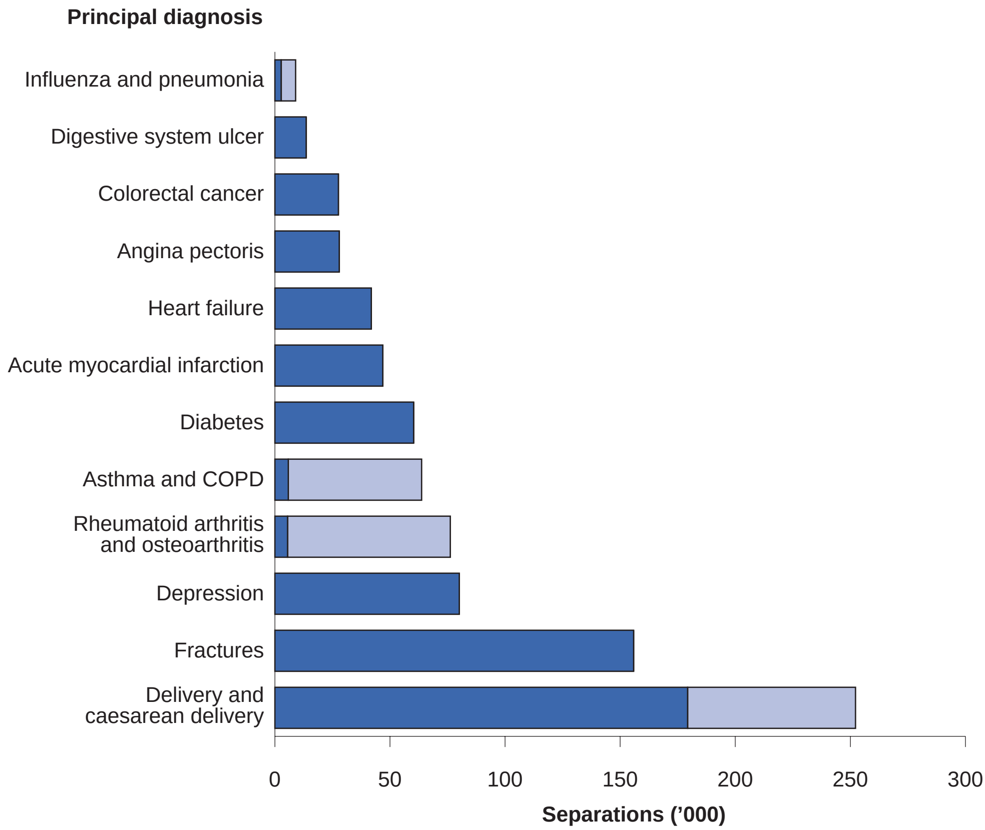
Each AR-DRG is associated with information on the average length of stay and estimated average cost for patients in the group in the public and private sectors. This classification therefore has use in measuring the outputs and performance of hospitals, and in planning and funding hospital service provision.

The diagnoses view of hospital activity

For patients with a disease or injury recorded as a principal diagnosis (see Boxes 7.5 and 7.6), over half of all separations in Australian hospitals in 2003–04 had a principal diagnosis in five of the broad ICD-10-AM chapter groups. These were *Diseases of the digestive system*, *Neoplasms*, *Diseases of the circulatory system*, *Injury and poisoning* and *Contact with health services* (including dialysis, chemotherapy and rehabilitation) (Tables S28 and S29).

Chronic diseases (see Chapter 2) were represented in some high-volume diagnoses in 2003–04. There were around 64,000 separations with a principal diagnosis of *Asthma and chronic obstructive pulmonary disease*, 76,000 for *Rheumatoid arthritis and osteoarthritis*, and 42,000 for *Heart failure* (Figure 7.5). Also of high volume was childbirth: there were

73,000 separations with a principal diagnosis of *Childbirth by caesarean section* and 180,000 for *Other delivery*.



Notes

1. For bars with two values, the darker shading refers to the first part of the label.
2. COPD—chronic obstructive pulmonary disease.

Source: National Hospital Morbidity Database.

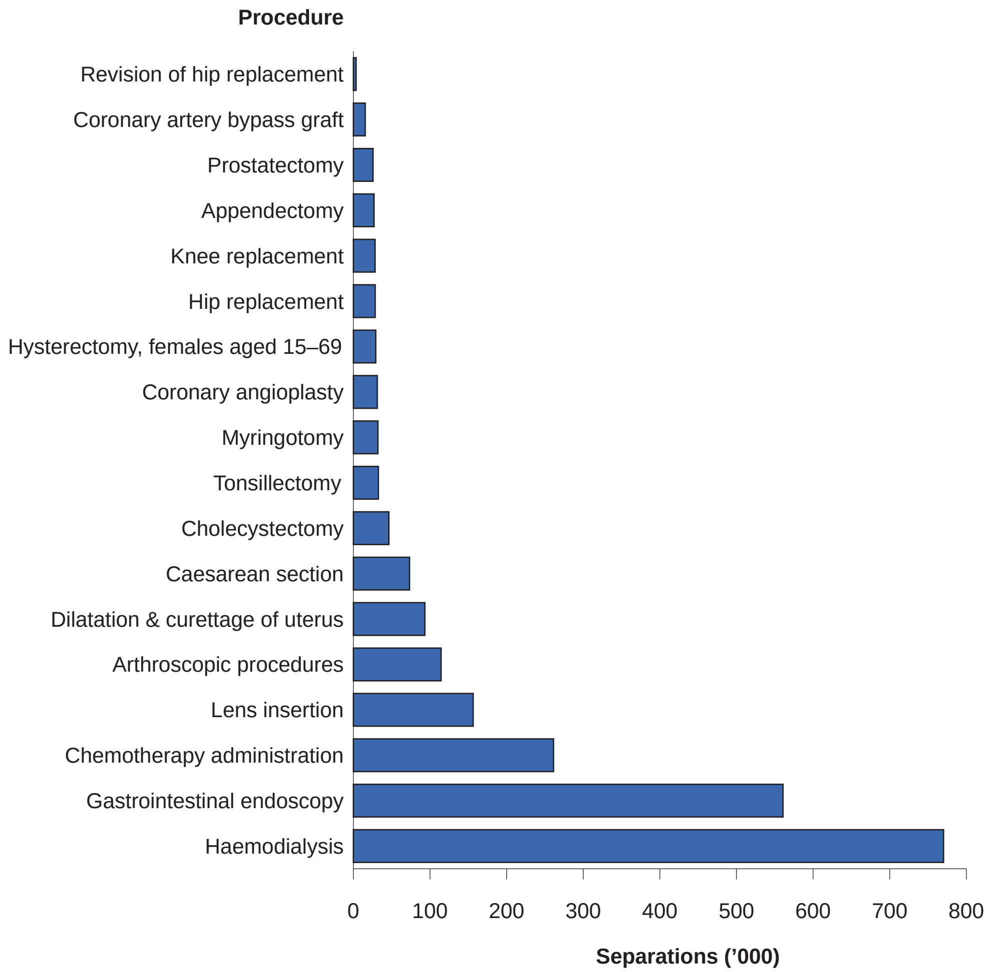
Figure 7.5: Separations for selected principal diagnoses, public and private hospitals combined, 2003–04

The procedures view of hospital activity

Procedures are a very common part of hospital treatment, especially so for private hospitals: a procedure was reported for 80.6% of separations from Australian hospitals in 2003–04. Of these, 56.1% were from public hospitals, although public hospitals accounted for 61.4% of separations overall. Similarly, although 69.6% of overall patient-days were in public hospitals, only 66.9% of patient-days associated with procedures were in public hospitals. This reflects the higher proportion of separations in private hospitals (91.7%) that had a procedure, compared to public hospitals (73.6%).

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 (738,000 separations) (Table S30). *Haemodialysis* accounted for 86% (636,000) of these separations. The most commonly reported procedure group for the private sector was *Operations on the digestive system* (566,000) (Table S31). Within that grouping, *Panendoscopy with excision* was reported for 29% of such separations, and *Fibreoptic colonoscopy with excision* for 23%.

Other commonly reported procedures across both sectors were *Gastrointestinal endoscopy* (561,000 separations), *Chemotherapy administration* (261,000), *Lens insertion* (156,000) and *Arthroscopic procedures* (114,000) (Figure 7.6).



Source: National Hospital Morbidity Database.

Figure 7.6: Separations for selected procedures, public and private acute hospitals combined, 2003–04

Some procedures are being increasingly undertaken in the private sector rather than in the public sector. For example, between 1999–00 and 2003–04 the number of separations for caesarean section rose by 56.5% in the private sector, compared with 18.4% in the public sector. For gastrointestinal endoscopy, the number of separations increased by 25.2% in private hospitals across the same period, compared with a fall of 6.9% in public hospitals.

The AR-DRGs view of hospital activity

The AR-DRG classification takes both diagnoses and procedures (if relevant) into account, along with length of stay and other patient factors. It is therefore a composite view of hospitalisations and is useful for describing the overall nature of hospital care.

In 2003–04, 72.4% of acute hospital separations in the public sector were for medical (that is, non-surgical) AR-DRGs (2.9 million), compared with 37.8% in the private sector (1.0 million). In contrast there was a larger proportion of separations for surgical AR-DRGs in the private sector (41.1%) than in the public sector (20.7%) (see also Tables S32 and S33).

In public hospitals, separations with medical AR-DRGs increased by 13.8% between 1999–00 and 2003–04, while those with surgical AR-DRGs decreased by 3.9% and other AR-DRGs decreased by 3.7% in the same period. In private hospitals, separations with medical AR-DRGs also increased, by 36.4%, and those with surgical and other AR-DRGs increased by 26.6% and 27.1% respectively. Thus in 2003–04 the number of surgical separations from private hospitals (1.0 million) exceeded those from public hospitals (0.8 million).

The AR-DRGs with the highest numbers of separations in 2003–04 featured several for which same-day separations dominated (Table 7.14). Among these were the top two groups in public hospitals, *Admit for renal dialysis* (621,000 public sector separations) and *Chemotherapy* (127,000 separations). *Chemotherapy* topped the list in the private sector (144,000 separations), followed by *Other colonoscopy, same-day* (140,000 separations). *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 (90,000 separations) and the fifteenth most common in private hospitals (35,000 separations).

Admitted patient care for war veterans

Veterans receive admitted patient care in both public and private hospitals. In 2003–04, just under 344,000 separations for veterans were reported to the National Hospital Morbidity Database: 138,000 from public hospitals and 205,000 from private hospitals. The most frequently reported AR-DRGs were *Admit for renal dialysis* (23,000 in public hospitals and 16,000 in private hospitals), *Lens procedure, same-day* (1,400 and 14,000 respectively), and *Chemotherapy* (3,000 and 10,000 respectively). Eligibility to receive hospital treatment as a DVA patient may not necessarily have been confirmed by the DVA for these separations.

Non-admitted occasions of service

In 2003–04 there were 43.6 million occasions where individuals received a service through public acute hospitals but were not admitted. This corresponds to over two such services per Australian in that year. Of these, 5.9 million (13.4%) were accident and emergency occasions of service, 4.5 million (10%) were allied health services, and 9.7 million (22%) were other services such as radiology and organ imaging. In addition to the services provided to individuals, around 444,000 services for groups of patients were delivered through public acute hospitals (around 1% of the total non-admitted services).

Table 7.14: Top 12 AR-DRGs version 5.0 with the highest number of separations from acute hospitals, 2003–04[(a)]

AR-DRG	Separations	Same-day separations (%)	Patient-days	Average length of stay (days)
Admit for renal dialysis	754,300	99.9	754,500	1.0
Chemotherapy	271,300	99.9	271,600	1.0
Other colonoscopy, same-day	189,800	100.0	189,800	1.0
Other gastroscopy for non-major digestive disease, same-day	147,300	100.0	147,300	1.0
Lens procedure, same-day	140,500	100.0	140,500	1.0
Vaginal delivery without catastrophic or severe complications or co-morbidities	125,300	2.0	433,300	3.5
Dental extractions and restorations	103,300	95.2	105,200	1.0
Mental health treatment same-day without electroconvulsive therapy	91,800	100.0	91,800	1.0
Other skin, subcutaneous tissue and breast procedures	89,200	92.1	102,300	1.1
Follow-up after completed treatment with endoscopy	84,000	97.0	85,200	1.0
Complex gastroscopy, same-day	79,000	100.0	79,100	1.0
Other factors influencing health status, same-day	78,800	100.0	78,800	1.0

(a) Separations for which the care type was reported as acute, or as newborn (with qualified patient days), or was not reported. Public and private hospitals included.

Source: AIHW National Hospital Morbidity Database.

The states and territories vary in how they collect data on non-admitted patient occasions of service, and in the extent to which they provide these types of services in non-hospital settings (such as community health centres), and this may affect the comparability of data on this type of hospital activity (see Box 7.5).

Private hospitals also provide non-admitted patient services, with a different mix of types compared with the public hospitals. In 2003–04, private hospitals reported 1.9 million occasions of service (ABS 2005), with the largest numbers being for accident and emergency (472,000 or 25%) and allied health services (344,000 or 18%).

Geographic variation in the use of accident and emergency services

The ratio of services provided in an area to the number of residents in that area is an approximation of population use, although services provided in an area may be used by persons residing in other areas.

In terms of public hospital accident and emergency services in 2003–04, nationally the rate varied from 240 per 1,000 population in major cities to 369 in regional areas and 836 in remote areas (Table 7.15). 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 Aboriginals and Torres Strait Islanders, who have higher population concentrations in remote areas.

By contrast there were fewer accident and emergency occasions of service per 1,000 population for private hospitals in regional and remote areas than in major cities. The rates ranged from 27 per 1,000 population in major cities to 19 in regional areas and 8 in remote areas in 2003–04 (ABS 2005).

Table 7.15: Accident and emergency occasions of service in public acute hospitals, 2003–04

Region	NSW	Vic[(a)]	Qld	WA	SA	Tas	ACT	NT	Total
					Services ('000)				
Major Cities	1,147	845	480	278	313	. .	97	. .	3,159
Inner Regional	600	332	362	52	47	64	0	. .	1,456
Outer Regional	205	113	271	101	66	31	. .	42	828
Total regional	*804*	*445*	*632*	*154*	*113*	*94*	*0*	*42*	*2,284*
Remote	25	n.a.	77	90	25	6	. .	43	265
Very Remote	10	. .	59	58	11	1	. .	17	156
Total remote	*36*	*n.a.*	*136*	*148*	*35*	*7*	*. .*	*60*	*421*
Total	**1,986**	**1,289**	**1,248**	**580**	**461**	**101**	**97**	**102**	**5,864**
					Services per 1,000 population resident in area[(b)]				
Major Cities	240	234	240	202	285	. .	301	. .	240
Inner Regional	435	318	367	212	244	209	0	. .	351
Outer Regional	423	444	406	544	369	190	. .	392	406
Total regional	*432*	*342*	*383*	*355*	*304*	*202*	*0*	*392*	*369*
Remote	651	n.a.	825	989	534	688	. .	1,031	817
Very Remote	1,252	. .	1,109	1,152	791	354	. .	351	871
Total remote	*753*	*n.a.*	*928*	*1,047*	*593*	*610*	*. .*	*662*	*836*
Total	**297**	**262**	**328**	**297**	**302**	**212**	**300**	**515**	**295**

n.a. Not available.

. . Not applicable.

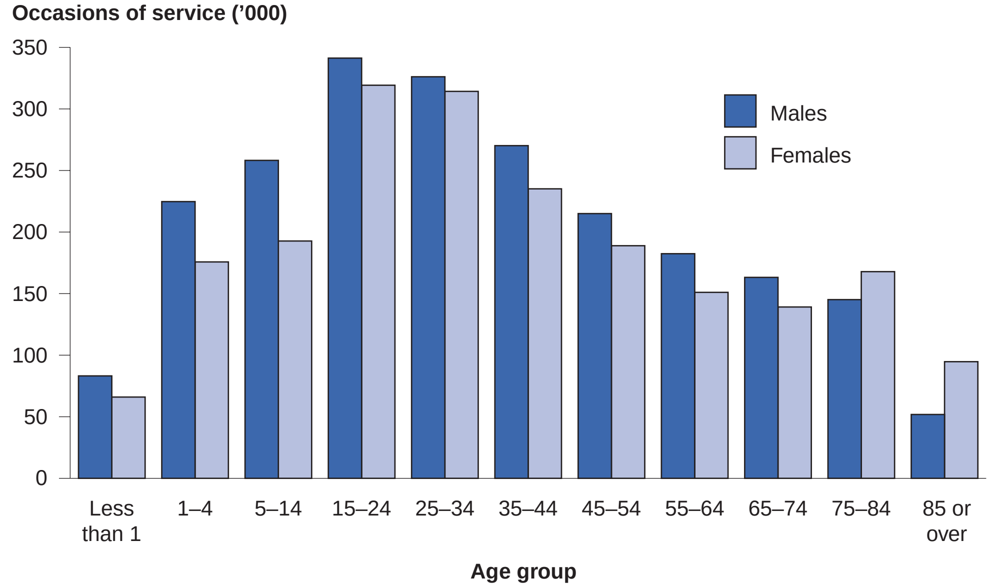
(a) In Victoria, it is not possible to separately identify emergency occasions of service in hospital campuses located in remote areas.

(b) The ratio of services provided in the area to the number of residents in the area only approximates population use, as services in one area may be provided to persons residing in other areas.

Source: AIHW 2005b.

Age and sex distribution of the use of accident and emergency services

For 2003–04, data on the patient's age group and sex were available for over 4.3 million emergency department occasions of service in public hospitals (about 73% 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 2005b). Almost 53% 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 patients aged 75 years or over (Figure 7.7). The use of emergency departments was highest in the 15–24 and 25–34 years age groups, and the overall pattern is quite different from that for admitted patient care, which essentially rises with age.



Source: AIHW 2005b.

Figure 7.7: Emergency department occasions of service, 2003–04

How many hospitals and beds are there?

Nationally, public acute care hospital numbers grew from 704 in 1995–96 to 741 in 2003–04. In contrast, over the same period, private hospitals other than free-standing day hospital facilities decreased from 323 to 291 (Table 7.16). The number of private free-standing day hospital facilities experienced an increase from 140 in 1995–96 to 248 in 2002–03 and then decreased to 234 in 2003–04. These facilities provide investigation and treatment services for admitted patients on a day-only basis.

The number of public psychiatric hospitals declined from 37 in 1993–94 to 23 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.

Comparing hospital services capacity

Public acute hospitals can be described in terms of 'peer groups' (Table 7.18), based on their volume of admitted patient activity and geographical location (AIHW 2005b). This peer grouping was developed to explain variability in the average cost per casemix-adjusted separation and also illustrates some of the attributes of the state and territory hospital systems. Thus, *Small hospitals* had an average of 23 beds in 2003–04, and were most numerous in New South Wales and Queensland. *Principal referral and specialist women's and children's hospitals* averaged 428 beds each nationally.

Changes in the numbers of hospitals are often due to changes in administrative or reporting arrangements and not necessarily to changes in the number of hospital campuses or buildings. A more reliable indicator of the availability of hospital services may be numbers of hospital beds. However, the concept of an available bed is also becoming less important, for example in the light of increasing same-day hospitalisations and provision of 'hospital in the home' care. The comparability of bed numbers can also be affected by the casemix of hospitals with, for example, differing proportions of beds available for special and more general purposes.

Between 1995–96 and 2003–04, there was a 2.8% decrease in available beds and an 11% reduction in available beds per 1,000 population (Table 7.16). The change in beds per 1,000 population was not evenly distributed between the public and private sectors, with private sector beds per 1,000 population remaining stable during this period and public sector beds per 1,000 population decreasing by 18%.

Table 7.16: Hospitals and available beds, 1995–96 to 2003–04

Measure/sector	1995–96	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04
Hospitals									
Public acute	712	707	738	733	726	727	725	729	741
Public psychiatric	26	20	22	22	22	22	21	19	20
Total public	*738*	*727*	*760*	*755*	*748*	*749*	*746*	*748*	*761*
Private free-standing day hospital facilities	140	153	175	175	190	207	236	248	234
Private other[(a)]	323	319	317	317	312	302	301	301	291
Total private	*463*	*472*	*492*	*492*	*502*	*509*	*537*	*549*	*525*
Total	**1,201**	**1,199**	**1,252**	**1,247**	**1,250**	**1,258**	**1,283**	**1,297**	**1,286**
Available beds[(b)]									
Public acute	55,891	53,478	52,801	51,423	50,188	49,979	49,052	49,791	50,915
Public psychiatric	3,867	3,359	2,935	3,571	2,759	2,430	2,409	2,523	2,560
Total public	*59,758*	*56,837*	*55,736*	*54,994*	*52,947*	*52,409*	*51,461*	*52,314*	*53,475*
Private free-standing day hospital facilities	1,023	1,163	1,348	1,460	1,581	1,688	1,851	1,910	1,947
Private other[(a)]	22,757	22,966	23,019	23,746	23,665	24,465	25,556	24,454	24,642
Total private	*23,780*	*24,129*	*24,367*	*25,206*	*25,246*	*26,153*	*27,407*	*26,364*	*26,589*
Total	**83,538**	**80,966**	**80,103**	**80,200**	**78,193**	**78,562**	**78,868**	**78,678**	**80,064**
Available beds (per 1,000 population)[(b)]									
Public acute	3.1	2.9	2.8	2.7	2.6	2.6	2.5	2.5	2.5
Public psychiatric	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
Total public	*3.3*	*3.1*	*3.0*	*2.9*	*2.8*	*2.7*	*2.6*	*2.6*	*2.7*
Private free-standing day hospital facilities	0.1	0.1	0.1	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	1.3	1.3	1.2	1.2
Total private	*1.3*	*1.3*	*1.3*	*1.3*	*1.3*	*1.4*	*1.4*	*1.3*	*1.3*
Total	**4.5**	**4.4**	**4.3**	**4.2**	**4.1**	**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 2005b and earlier editions.

State and territory variation in hospital capacity

In 2003–04, the average number of public hospital beds per 1,000 population ranged from 2.1 in the Australian Capital Territory to 3.2 in South Australia. For the private sector, there was a range from 1.1 in the New South Wales to 1.6 in Queensland (Table 7.17). The ratio of public beds per 1,000 population to private beds per 1,000 population was 2.0 nationally, ranging from 1.6 in Queensland and Western Australia to 2.7 in New South Wales.

Table 7.17: Available hospital beds per 1,000 population, 2003–04

Sector	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Public acute hospitals	2.7	2.4	2.4	2.4	2.9	2.2	2.1	2.9	2.5
Public psychiatric hospitals	0.2	0.0	0.1	0.1	0.2	0.1	. .	. .	0.1
Total public	*2.9*	*2.4*	*2.5*	*2.5*	*3.2*	*2.4*	*2.1*	*2.9*	*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)]	1.0	1.3	1.5	1.5	1.3	n.a.	n.a	n.a.	1.2
Total private	*1.1*	*1.4*	*1.6*	*1.5*	*1.4*	*n.a.*	*n.a.*	*n.a.*	*1.3*
Total available beds per 1,000 population	4.0	3.8	4.1	4.1	4.5	n.a.	n.a.	n.a.	4.0

(a) Includes private acute and private psychiatric hospitals.

n.a. Not available but included in totals.

. . Not applicable.

Source: AIHW 2005b.

How well are hospitals performing?

Given the extensive activity of hospitals, the serious health cases they manage, and the great public expenses they incur, it is important to try to measure their performance.

The National Health Performance Framework includes nine areas in which to assess how well the health system is performing (NHPC 2002; see also Chapter 1). 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 is applicable to all hospitals.

Costs of public hospital care

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.

Nationally, the average cost per casemix-adjusted separation was $3,293 (Table 7.18), varying from $2,929 for Queensland to $4,002 for the Australian Capital Territory, and from $3,132 for *Large hospitals* to $3,482 for *Small hospitals*.

Table 7.18: Public hospital cost per casemix-adjusted separation(a), 2003–04

Peer group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Principal referral and specialist women's and children's hospitals									
Number of hospitals	20	16	16	4	5	2	1	2	66
Average beds per hospital	405	553	355	502	377	392	498	230	428
Average cost weight	1.15	1.00	1.06	1.11	1.07	1.05	0.97	0.77	1.06
Cost per casemix-adjusted separation ($)	3,547	3,360	3,070	3,328	3,014	3,216	n.p.	3,365	3,329
Large hospitals									
Number of hospitals	22	8	7	4	2	1	1	0	45
Average beds per hospital	178	113	128	107	210	131	175	. .	152
Average cost weight	1.04	0.86	0.91	0.80	1.10	1.12	0.97	. .	0.97
Cost per casemix-adjusted separation ($)	3,272	3,056	2,360	3,251	3,226	n.p.	n.p.	. .	3,132
Medium hospitals									
Number of hospitals	41	21	15	9	13	0	0	0	99
Average beds per hospital	64	50	57	88	55	. .	. .	. .	61
Average cost weight	0.92	0.78	0.79	0.89	0.80	. .	. .	. .	0.85
Cost per casemix-adjusted separation ($)	3,357	3,172	2,283	3,696	3,075	. .	. .	. .	3,215
Small acute hospitals									
Number of hospitals	33	18	32	16	14	6	0	3	122
Average beds per hospital	26	21	22	27	25	10	. .	37	23
Average cost weight	0.81	0.78	0.74	0.80	0.82	0.77	. .	0.64	0.78
Cost per casemix-adjusted separation ($)	3,494	4,030	2,854	4,152	2,682	4,068	. .	3,458	3,482
Total selected public acute hospitals									
Number of hospitals	116	63	70	33	34	9	2	5	332
Average beds per hospital	133	177	116	111	99	108	337	114	133
Average cost weight	1.07	0.96	1.00	1.00	1.01	1.05	0.97	0.75	1.01
Cost per casemix-adjusted separation ($)	3,451	3,333	2,929	3,422	3,036	3,333	4,002	3,377	3,293

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 (2005b). 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 7.16.

Source: AIHW 2005b.

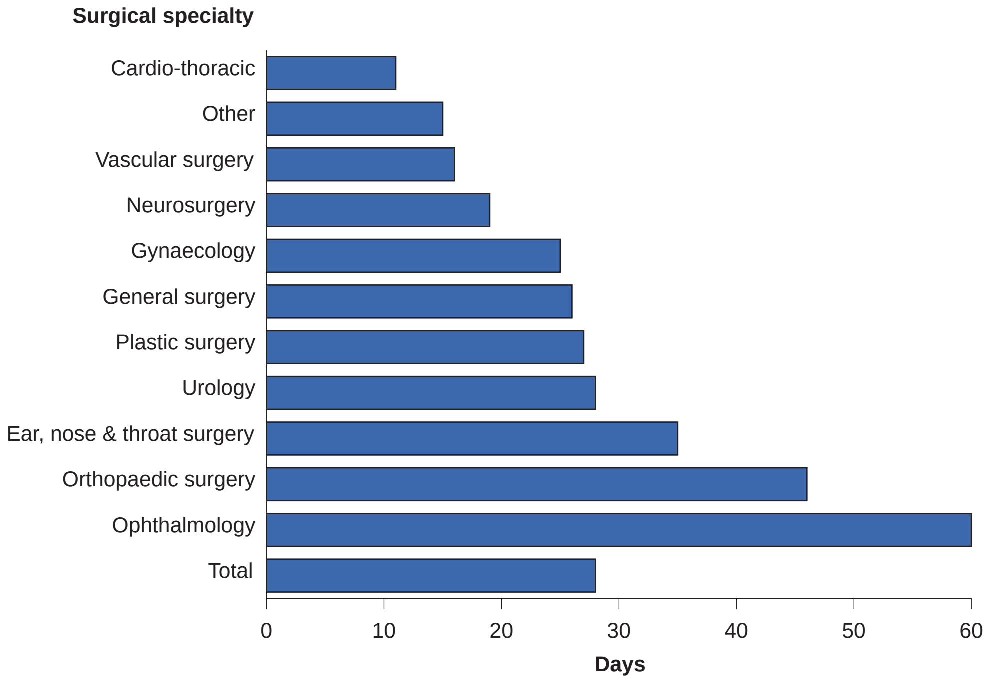
Elective surgery waiting times

Waiting times for elective surgery are indicators of access to 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 list. This is because without knowing the rate of turnover of patients on a waiting list, its size is not a reliable indicator of the amount of time that a patient waits for surgery.

In 2003–04, the AIHW National Elective Surgery Waiting Times Data Collection included data for an estimated 87% of public hospital elective surgery admissions

(AIHW 2005b). Data were not available for smaller hospitals in several states; these hospitals may not have had waiting lists or may have had different waiting list characteristics compared with reporting hospitals.

Overall, the median waiting time for elective surgery was 28 days in 2003–04 (Figure 7.8), and this figure has been stable for the previous few years. *Ophthalmology* and *Orthopaedic surgery* were the surgical specialties with the longest median waiting times in 2003–04 (60 and 46 days respectively). All other specialties except *Ear, nose and throat surgery* had median waiting times of less than 30 days; *Cardio-thoracic surgery* had the shortest median waiting time (11 days).



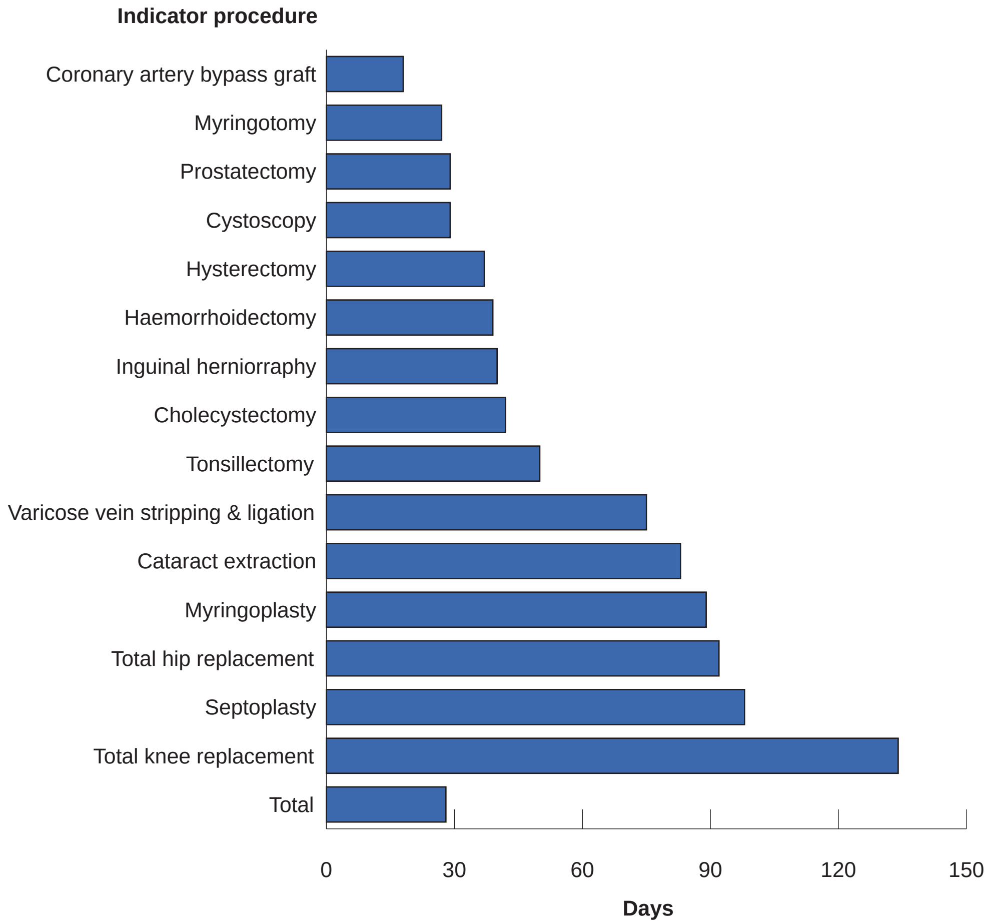
Source: AIHW 2005b.

Figure 7.8: Median waiting times, by specialty of surgeon, public hospitals, 2003–04

Another view of the waiting times is through 'indicator' procedures, which are high-volume procedures sometimes associated with long waits. The indicator procedure with the lowest median waiting time in 2003–04 was *Coronary artery bypass graft* (18 days) and the highest was for *Total knee replacement* (134 days) (Figure 7.9).

Emergency department waiting times

Emergency department waiting times are regarded as indicators of the responsiveness of the acute care sector (NHPC 2002). This information is summarised as the proportions of patients who wait longer for care than is appropriate for their condition, and is presented here for selected public hospital emergency departments.



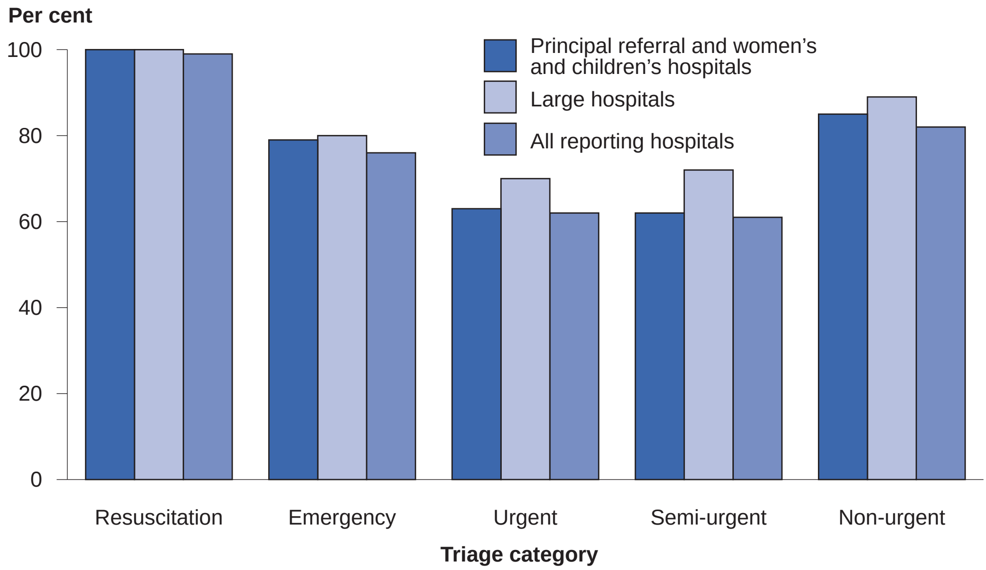
Source: AIHW 2005b.

Figure 7.9: Median waiting times, by indicator procedure, public hospitals, 2003–04

The urgency of the patient's need for medical and nursing care is indicated by a triage category. When a patient presents 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.

In 2003–04, information on emergency department waiting times was available for about 73% of all public hospital emergency department occasions of service, including about 98% 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 2005b). The proportion of patients receiving care on time varied by triage category, from 99% for resuscitation patients to 61% for semi-urgent patients. Overall, the proportion of patients receiving emergency department care within the required time was 72% (67% in the *Principal referral and specialist women's and children's hospitals* peer group and 74% in the *Large hospitals* peer group). For the non-urgent triage category, 82% of all patients were seen on time (Figure 7.10).



Source: AIHW 2005b.

Figure 7.10: Emergency department occasions of service seen on time, 2003–04

Adverse events

Adverse events are defined as incidents in which harm resulted to a person receiving health care. They include infections, falls and other injuries, and medication and medical device problems. The Australian Council for Safety and Quality in Health Care estimated that in the year 2000 an adverse event was associated with about 10% of hospital separations in Australia and other developed countries (ACSQHC 2001). About 2% of separations were also estimated to be associated with serious adverse events causing major disability (1.7%) or death (0.3%) (Runciman et al. 2000).

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 (see Box 7.6) that specify 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 involving hospitals.

In 2003–04, there were almost 320,000 separations with an ICD-10-AM code for an adverse event — or 4.7 per 100 separations — comprising 225,000 separations in the public sector (5.4 per 100 separations) and 95,000 separations in the private sector (3.6 per 100 separations) (Table 7.19). The data for public hospitals are not comparable with the data for private hospitals because their casemixes differ and recording practices may be different.

Table 7.19: Hospital separations[(a)] with an adverse event, by hospital sector[(b)], 2003–04

	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	65,800	1.6	17,200	0.7	83,000	1.2
Misadventures to patients during surgical and medical care	7,300	0.2	2,500	0.1	9,800	0.1
Procedures causing abnormal reactions/ complications	137,500	3.3	68,800	2.6	206,300	3.0
Other external causes of adverse events	4,300	0.1	700	< 0.1	5,000	0.1
Place of occurrence code						
Health service area	199,300	4.7	86,200	3.3	285,500	4.2
Diagnosis codes						
Selected post-procedural disorders	31,500	0.8	16,200	0.6	47,700	0.7
Haemorrhage and haematoma complicating a procedure, nec	19,300	0.5	10,800	0.4	30,100	0.4
Infection following a procedure, nec	21,000	0.5	9,100	0.3	30,100	0.4
Complications of internal prosthetic devices, implants and grafts	41,700	1.0	21,400	0.8	63,200	0.9
Other diagnoses of complications of medical and surgical care	34,300	0.8	12,800	0.5	47,100	0.7
Total[(c)]	**224,800**	**5.4**	**94,500**	**3.6**	**319,300**	**4.7**

(a) Excludes separations for which the care type was reported as *Newborn with no qualified days*, and records for *Hospital boarders* and *Posthumous organ procurement*.

(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 sum 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.

nec Not elsewhere classified.

Source: AIHW 2005b.

Procedures causing abnormal reactions/complications were reported for 206,000 separations; 83,000 separations included a report of *Adverse effects of drugs, medicaments and biological substances* and 63,000 separations included a report of *Complications of internal prosthetic devices, implants and grafts*.

7.6 Specialised mental health services

Australians use 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 care facilities. 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.

Historically, stand-alone public psychiatric hospitals were the main focus of specialised mental health care. However, the development of effective drugs, changes in clinical practice and the emergence of the human rights movement provided the setting for reform of mental health care. Since 1993, national action to reform mental health care has been driven by a series of national mental health plans under the National Mental Health Strategy and has resulted in a reduced role for public psychiatric hospitals and greater roles for other hospitals and for non-hospital service providers.

Private psychiatry

In 2004–05, there were an estimated 1,063 full-time equivalent psychiatrists in private practice in Australia, and they were heavily concentrated in the cities (AIHW 2005c). There were 940 in metropolitan areas (7.1 per 100,000 population) and 123 (1.8 per 100,000 population) in regional and remote areas.

Medicare funded 2.0 million services by private psychiatrists in 2004–05. They included 1.7 million patient attendances in consulting rooms, around 209,000 patient attendances in hospitals and around 41,000 group psychotherapy services. Females received more services (1.2 million or 120 per 1,000 population) than males (0.8 million, or 79 per 1,000), and the highest rates were reported for both sexes in the 45–54 years age group (214 per 1,000 population for females and 137 per 1,000 for males).

Medicare expenditure on these services was $214 million in total, including $194 million for patient attendances in consulting rooms and $15 million in hospitals. Note that to receive maximum Medicare benefits, consultation with a specialist psychiatrist generally requires a referral from another medical practitioner.

Private psychiatrists provided 1,996,633 prescriptions subsidised by the PBS and RPBS in 2004–05. The most commonly prescribed drugs were antidepressants (1,081,247) and antipsychotics (334,296). PBS and RPBS expenditure for these pharmaceuticals was $123 million, including $65 million for antipsychotics and $42 million for antidepressants (AIHW 2005c).

Community-based mental health services

Government-operated services provide specialised mental health care to patients in community-based settings, including facilities in which clients may stay for periods. Some services are tailored for adults, for older adults, and for children and adolescents. These services—based in hospitals and other community settings—provide psychiatric outpatient services, day programs and community outreach services.

In 2003–04, these services had a recurrent expenditure of $922 million and an average of 10,783 full-time equivalent staff (AIHW 2005c). Staff numbers increased by 26% over the five years from 1999–00.

In 2003–04 there were 4.9 million service contacts between clients and staff reported by community mental health care services to the AIHW National Community Mental Health Establishments Database. More service contacts were reported for males (2.5 million) than for females (2.3 million) and a large portion of the services were recorded for persons aged 25–34 years (1.1 million) and 35–44 years (1.0 million) (AIHW 2005c).

Schizophrenia, schizotypal and delusional disorders accounted for over 48% of service contacts for which a principal diagnosis was reported (Table 7.20). Other commonly-reported diagnoses were *Mood (affective) disorders* (24%) and *Neurotic, stress-related and somatoform disorders* (10%).

Table 7.20: Service contacts in government-operated community mental health services[(a)], 2003–04

Principal diagnosis	Number	Proportion of service contacts with a principal diagnosis (%)
Organic, including symptomatic, mental disorders	130,300	3.9
Mental and behavioural disorders due to psychoactive substance use	75,800	2.3
Schizophrenia, schizotypal and delusional disorders	1,612,800	48.8
Mood (affective) disorders	807,200	24.4
Neurotic, stress-related and somatoform disorders	315,000	9.5
Behavioural syndromes associated with physiological disturbances and physical factors	27,600	0.8
Disorders of adult personality and behaviour	129,200	3.9
Mental retardation	11,800	0.4
Disorders of psychological development	24,500	0.7
Behavioural and emotional disorders with onset usually occurring in childhood and adolescence	102,800	3.1
Other	66,800	2.0
Total with specified principal diagnosis	3,303,700	100.0
No principal diagnosis reported, including Mental disorder not otherwise specified	1,608,000	. .
Total	**4,911,700**	**. .**

(a) These data should be interpreted with caution due to differences in the statistical unit used by jurisdictions for reporting principal diagnosis.

. . Not applicable.

Source: AIHW 2005c.

Non-government organisations also provide community-based mental health-related care. For example, disability support services funded under the Commonwealth State/Territory Disability Agreement provided non-residential disability support services to over 24,000 clients with a psychiatric disability in 2003–04 (AIHW 2005c).

Specialised residential facilities

Specialised residential mental health care facilities are services that provide residential care and employ specialised mental health care staff on-site. Some are government-operated and others are operated by non-government organisations.

In 2003–04, government-operated facilities that were staffed for 24 hours per day had a total of 1,247 available beds. A total of around 1,900 residential stays were reported for this period, implying a long period of residence on average. Non-government organisations funded under the Commonwealth State/Territory Disability Agreement provided residential disability support services to almost 3,000 clients with a psychiatric disability in 2003–04 (AIHW 2005c).

Hospital-based mental health care

Specialised mental health care is provided to admitted patients in public psychiatric hospitals and in specialised psychiatric units in public acute and private hospitals. There were around 104,000 mental health-related separations involving specialised psychiatric care in public hospitals in 2003–04 (Table 7.21), associated with 1.8 million patient days. Public acute hospitals accounted for 85% of public hospital separations and 1.1 million (63%) of the days spent in hospital. The majority of public psychiatric and public acute hospitalisations were for at least one night (80.3% and 80.5%, respectively). For private hospitals, there were just under 100,000 mental health-related separations involving specialised psychiatric care in 2003–04, the majority of which were same-day (77%). There were almost 500,000 patient days associated with these hospitalisations.

Separation and patient day rates varied among the states and territories, possibly reflecting different service delivery and admission practices and/or differences in the types of establishments categorised as hospitals. Overall, the highest rates recorded for same-day separations were in Victoria, and for overnight separations in South Australia. The highest recorded patient day rates were in South Australia.

Involuntary hospitalisation was more frequent in public psychiatric hospitals, where 35.0% of the separations were involuntary, compared with 17.0% of separations in public acute hospitals and 0.3% in private hospitals.

Of the separations with specialised care, 87,000 same-day separations (13,000 in public hospitals and 73,000 in private hospitals) could be considered to be equivalent to ambulatory mental health care (AIHW 2005c). These either had psychosocial interventions as the only reported interventions, or no reported interventions.

Excluding the ambulatory-type separations, the most frequently recorded principal diagnosis group for overnight separations in public hospitals was *Schizophrenia, schizotypal and delusional disorders* (30,000 separations) (Table 7.22), followed by *Mood (affective) disorders* (22,000). For same-day separations, the most common was *Mood (affective) disorders* (4,000). In private hospitals, the most frequently recorded principal diagnosis for both overnight and same-day separations was *Mood (affective) disorders* (12,000 and 3,000 separations, respectively).

Table 7.21: Separations with specialised psychiatric care, 2003–04

Sector/measure	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
					Number				
Public acute hospitals	26,600	18,400	23,900	7,000	6,700	2,800	1,100	1,000	87,500
Public psychiatric hospitals	10,800	400	400	1,600	2,600	200	. .	. .	16,000
Private hospitals	25,400	38,800	21,800	8,900	2,400	n.a.	n.a.	n.a.	99,900
Separations, same-day	29,800	34,100	22,900	6,200	2,000	n.a.	n.a.	n.a.	97,400
Separations, overnight	33,000	23,500	23,300	11,400	9,700	n.a.	n.a.	n.a.	106,100
Total separations	*62,800*	*57,700*	*46,200*	*17,600*	*11,600*	*n.a.*	*n.a.*	*n.a.*	*203,500*
Patient-days	*793,900*	*461,000*	*251,600*	*487,200*	*218,600*	*n.a.*	*n.a.*	*n.a.*	*2,296,300*
					Number per 1,000 population				
Public acute hospitals	4.0	3.7	6.3	3.6	4.4	6.1	3.4	4.5	4.4
Public psychiatric hospitals	1.6	0.1	0.1	0.8	1.7	0.4	. .	. .	0.8
Private hospitals	3.8	7.8	5.6	4.5	1.5	n.a.	n.a.	n.a.	4.9
Separations, same-day	4.4	6.8	5.9	3.1	1.2	n.a.	n.a.	n.a.	4.8
Separations, overnight	5.0	4.7	6.1	5.8	6.3	n.a.	n.a.	n.a.	5.3
Total separations	*9.3*	*11.5*	*12.0*	*8.9*	*7.6*	*n.a.*	*n.a.*	*n.a.*	*10.1*
Patient-days	*117.5*	*91.6*	*126.6*	*129.3*	*138.5*	*n.a.*	*n.a.*	*n.a.*	*114.0*

Notes

1. Interpretation of differences between jurisdictions needs to be undertaken with care, as they may reflect different service delivery and admission practices and/or differences in the types of establishments categorised as hospitals. Victoria has only one public psychiatric hospital. It is a forensic facility and therefore not strictly comparable with public psychiatric hospitals in other jurisdictions.
2. This table includes ambulatory-equivalent separations, and is compiled from Table 3.34 and Table 4.2 in *Mental health services in Australia 2003–04* (AIHW 2005c).

. . Not applicable.

n.a. Not available.

Source: AIHW 2005c.

Principal diagnoses commonly reported for the same-day separations that could be considered ambulatory-equivalent were *Mood (affective) disorders* (3,000 separations in public hospitals and 37,000 in private hospitals) and *Neurotic, stress-related and somatoform disorders* (3,000 in public hospitals and 17,000 in private hospitals).

Shifting mental health care from public psychiatric hospitals

The mental health care reforms since 1993 have seen a reduction in the proportion of resources devoted to public psychiatric hospitals and a corresponding increase in resources for psychiatric units in acute care hospitals and for community-based specialised mental health care services.

Table 7.22: Separations[(a)] with specialised psychiatric care, by principal diagnosis, 2003–04 (number)

	Public hospitals[(b)]		Private hospitals	
Principal diagnosis	**Same-day**	**Overnight**	**Same-day**	**Overnight**
Organic, including symptomatic, mental disorders	35	1,640	12	300
Mental and behavioural disorders due to psychoactive substance use	130	6,260	64	3,050
Schizophrenia, schizotypal and delusional disorders	1,130	30,450	320	2,400
Mood (affective) disorders	4,470	22,170	2,900	11,870
Neurotic, stress-related and somatoform disorders	400	9,780	250	3,820
Behavioural syndromes associated with physiological disturbances and physical factors	70	780	26	620
Disorders of adult personality and behaviour	200	4,280	18	450
Mental retardation	2	210	0	7
Disorders of psychological development	76	170	2	12
Behavioural and emotional disorders with onset usually occurring in childhood and adolescence	95	750	0	21
Other or not reported	420	6,700	12	360
Total	**7,030**	**83,200**	**3,600**	**22,900**

(a) Excludes 86,800 same-day separations categorised as ambulatory-equivalent.

(b) Includes public psychiatric hospitals.

Source: AIHW 2005c.

There are two major sources of national data on public psychiatric hospitals: the AIHW's National Public Hospital Establishments Database (Table 7.16 and AIHW 2005b) and the Department of Health and Ageing's National Mental Health Report (DoHA 2005c). Public psychiatric hospitals have been defined slightly differently for each, but both illustrate the reduced role of these hospitals over recent years.

Between 1995–96 and 2003–04, the number of public psychiatric hospitals fell from 34 to 20 (see Table 7.16), and bed numbers fell 36%, from 3,992 to 2,561. Matching this pattern, between 1992–93 and 2002–03 there was a decrease in state and territory spending on public psychiatric hospitals, from 49% of total specialised mental health care expenditure, to 19% (DoHA 2005c). In 2003–04, total recurrent expenditure for public psychiatric hospitals (including non-admitted patient and community services managed by the hospital) was $488 million, and they employed an average of 5,600 full-time equivalent staff (AIHW 2005b).

The reduction in public psychiatric hospitals has been accompanied by an increase in the number of psychiatric unit beds in public acute care hospitals. They increased by 51% between 1992–93 and 1999–00, during which time there was an increase in spending on them from 22% to 30% of state and territory expenditure on specialised mental health services (DoHA 2005c). In 2003–04, there were 124 public acute hospitals with specialised psychiatric units, with a total of 3,463 beds.

In 2003–04, there were 25 private psychiatric hospitals. They had a total of 1,441 beds, within the range reported for 1999–00 to 2002–03 (1,369 to 1,463). These hospitals had an expenditure of $162 million, and employed an average of 1,672 full-time equivalent staff.

The reduction in public psychiatric hospitals has also been accompanied by an increase in resourcing for community-based mental health services. Between 1992–93 and 2002–03, the proportion of state and territory expenditure on specialised mental health services that was for community-based or ambulatory services rose from 29% to 51%, as did that for residential services, from 4% to 7% (DoHA 2005c).

Vietnam Veterans Counselling Service

As a population subgroup, Vietnam veterans have been found to have a higher prevalence of anxiety disorders, depression and post-traumatic stress disorder than the community generally. A study in 1997 reported a more than fourfold difference in the prevalence of post-traumatic stress disorder in veterans (36%) compared to the general community (8%), with the other conditions showing less dramatic, but still substantial, differences (DVA 1998).

The DVA recognised these conditions as consequences of war-related service and established the Vietnam Veterans Counselling Service (VVCS) to help veterans cope with these conditions. The VVCS offers free services to veterans of all conflicts, including those from peacekeeping missions. Partners and dependent children of all veterans are also eligible, as are the non-dependent children of Vietnam veterans. The service operates from 15 centres across Australia and provide services in rural, remote and outer metropolitan areas through more than 350 Outreach Program counsellors.

Available services include counselling, therapeutic and educational group programs, community development, and health promotion. Also available are specialised projects, such as one aimed at promoting cardiovascular fitness, and one aimed at reducing the risk of suicide in veterans' children. The VVCS also provides an after-hours telephone crisis counselling service called Veterans Line.

In 2004–05 the service provided 41,200 Outreach Program counselling sessions, handled almost 5,000 Veterans Line calls, and provided 24,000 centre-based services to around 4,800 clients.

7.7 Alcohol and other drug services

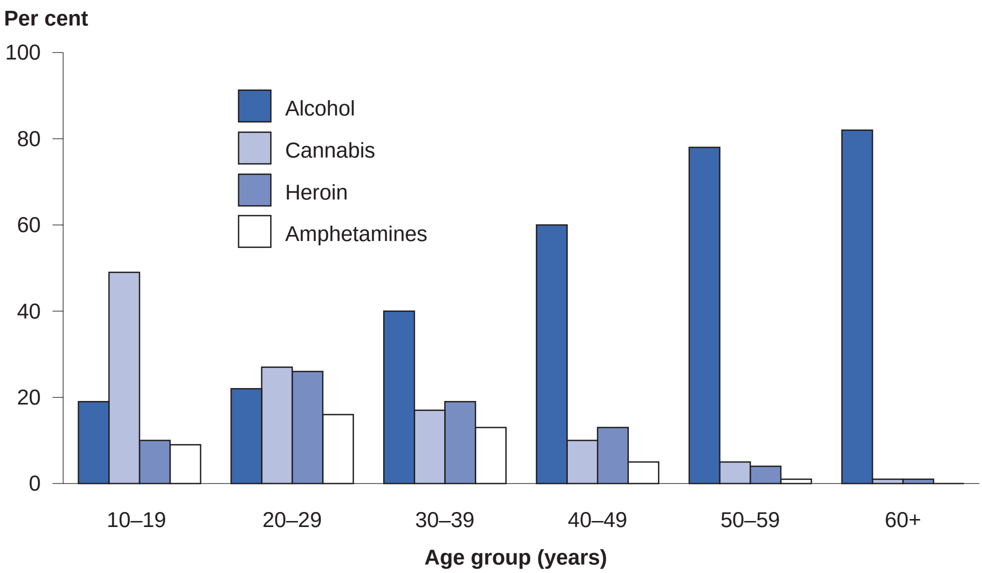
Alcohol and other drug treatment services cover a wide variety of treatment interventions and are provided in both residential and non-residential settings. The services include detoxification and rehabilitation programs, information and education courses, and pharmacotherapy and counselling treatments. In 2003–04, 622 treatment agencies managed or contracted by state and territory governments reported data for the Alcohol and Other Drug Treatment Services National Minimum Data Set (AODTS–NMDS), with 52% identified as non-government agencies (AIHW 2005d). This data set covers almost all government-funded treatment agencies. Major exceptions are services that are specific for Aboriginal and Torres Strait Islander peoples and those for which the sole treatment provided is methadone treatment (opioid pharmacotherapy maintenance).

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 could be for a single treatment (such as education and information only) that may or may not be part of a larger treatment plan.

During 2003–04, there were 137,000 treatment episodes in these 622 alcohol and other drug services. Male clients accounted for almost two-thirds (65%) of these episodes. One-third (33%) of all treatment episodes were for clients aged 20–29 years, with a further 28% for clients in the 30–39 years age group.

What drug problems do people seek treatment for?

The 'principal drug of concern' refers to the main substance that clients state led them to seek treatment from the treatment agency. In 2003–04, there were around 129,000 episodes where clients were seeking treatment for their own substance use and in turn nominated a principal drug of concern. Nationally, alcohol (38%) and cannabis (22%) were the most common principal drugs of concern to clients in closed treatment episodes, followed by heroin (18%) and amphetamines (11%). Cannabis was the drug most commonly recorded for clients in the 10–19 years age group (49%), whereas for those aged 30–39 years alcohol was the most common drug (40%) (Figure 7.11). While alcohol was the drug most likely to be the principal drug of concern overall, it was especially so for older clients, nominated in 82% of episodes for those aged 60 years or over, and in 78% for those aged 50–59 years.



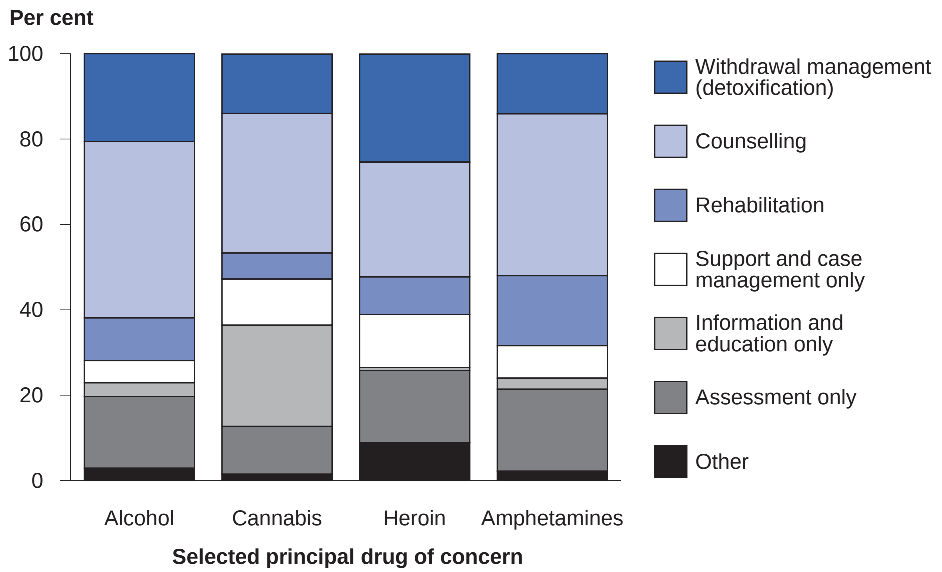
Source: AIHW 2005d.

Figure 7.11: Closed treatment episodes for selected principal drugs of concern, 2003–04

What types of treatments are provided?

In 2003–04, counselling was the most common form of main treatment provided (38% of treatment episodes), followed by withdrawal management (detoxification) (18%), assessment only (15%) and rehabilitation (9%).

The type of main treatment provided varied, depending on the principal drug for which the client sought treatment (Figure 7.12). Overall, counselling accounted for the highest proportion of closed treatment episodes for all drugs of concern except benzodiazepines. Where alcohol was the principal drug, the next most common treatment type was withdrawal management (detoxification) (21% of treatment episodes), followed by assessment only (17%) and rehabilitation (10%). This treatment mix was similar for clients whose principal drug was heroin and amphetamines. 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%), withdrawal management (detoxification) (14%) and assessment only (11%).



Note: 'Other' includes 2,953 closed treatment episodes where the main treatment was reported as pharmacotherapy. This represents a small proportion of pharmacotherapy treatment in Australia as agencies whose sole activity is to prescribe and/or dispense methadone or other opioid maintenance pharmacotherapies are currently excluded from the AODTS–NMDS.

Source: AIHW 2005d.

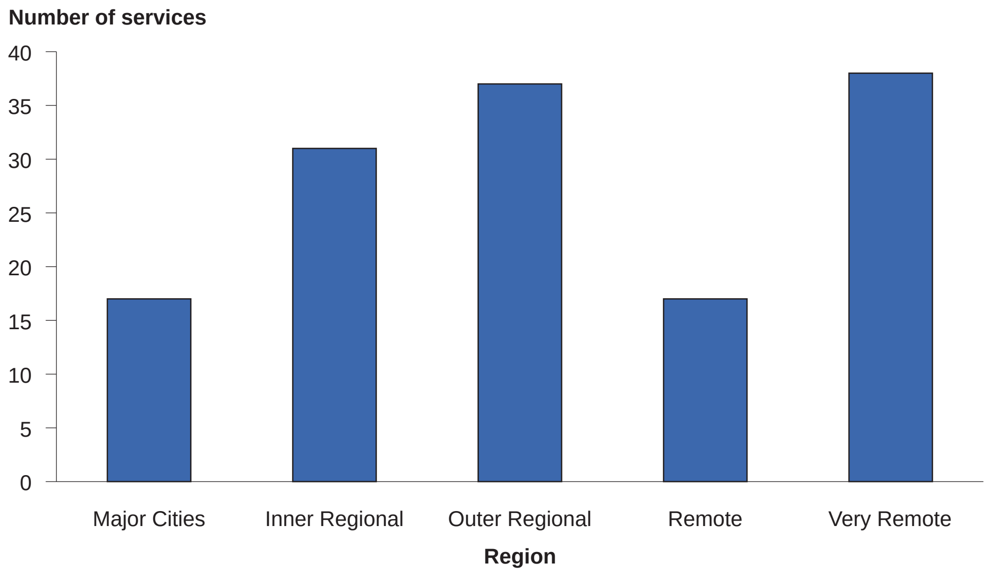
Figure 7.12: Closed treatment episodes, by selected main treatment type and selected principal drug of concern, 2003–04

7.8 Primary health care services for Indigenous Australians

Chapter 4 of this report provides data on the health status of, hospitalisation rates for and use of GPs by Aboriginal and Torres Strait Islander peoples, demonstrating that their pattern of use of these mainstream services is different from that of the rest of the Australian population. Health expenditure data (Chapter 6) reinforce this point.

Mainstream services are not always accessible to or the most appropriate provider for Indigenous Australians, due to geographic, social and cultural reasons. Because of this, and the relatively poor health status of Indigenous peoples generally, state, territory and Australian governments provide funds for specific health care services to meet their needs.

The state and territory governments provide funding primarily through hospitals, community clinics and Aboriginal Community Controlled Health Services (ACCHOs). The Australian Government, through the Office for Aboriginal and Torres Strait Islander Health (OATSIH), provides funding for a range of Indigenous-specific primary health care and substance misuse services, which are largely delivered in community-based settings. In 2003–04, OATSIH funded 140 organisations to provide or facilitate access to primary health care for Aboriginal and Torres Strait Islander peoples. Two-thirds (66%, 92 organisations) of these organisations were in outer regional, remote or very remote locations (Figure 7.13).



Source: Department of Health and Ageing, Service Activity Reporting, unpublished data.

Figure 7.13: Geographical distribution of Aboriginal and Torres Strait Islander primary health care services, 2003–04

The ACCHOs (also known as Aboriginal Medical Services) are mostly funded by OATSIH, with partial funding also provided—at varying levels—by state and territory governments. These organisations operate in urban, rural and remote locations and can be accessed by both Indigenous and other Australians. They offer a wide range of services, including:

- management of acute and chronic health conditions
- preventive health measures (such as immunisation and screening) and 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.

In 2003–04, an estimated 1.6 million episodes of health care were provided by Australian Government-funded Aboriginal and Torres Strait Islander primary health care services. This compares with approximately 1.5 million episodes in 2002–03, and successively lower numbers back to 0.9 million episodes in 1997–98. These services covered an estimated Indigenous health service population of 645,000 in 2000–01 (the population figure reflecting some overlap between services), compared with 410,000 in 1997–98. About 88% of the estimated episodes of health care in 2003–04 were provided to Aboriginal and Torres Strait Islander clients. Of these, 60% were provided to female clients.

In 2003–04, Indigenous Australians filled 64% of the full-time equivalent staff positions funded by Australian Government-funded Aboriginal and Torres Strait Islander primary health care services. Nearly all health workers and workers who dealt with substance misuse were Indigenous people, whereas most nurses and almost all doctors, dentists and specialists were non-Indigenous.

7.9 Allied health services

Allied health services are those services provided by licensed health professionals other than medical doctors and include such professions as chemists (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 two weeks. The results suggest that in any two-week period 9.4% of the population (1.8 million) consulted an allied health professional: 11.0% of females (1.1 million) and 7.7% of males (0.7 million) (ABS unpublished). About 4.1% (0.8 million) of Australians consulted a chemist, 1.9% (0.4 million) a physiotherapist, 1.3% (0.3 million) a nurse, and 0.9% (0.2 million) a chiropodist/podiatrist in any two-week period (Table 7.23). About 102,400 people also consulted an occupational therapist, audiologist/audiometrist, Aboriginal health worker or alcohol and drug worker.

Table 7.23: Persons reporting consultations with allied health professionals[(a)], 2004–05 ('000)

	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
Chemist	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	22.8	*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	21.6	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 two 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 more than one type of professional.

Source: ABS unpublished data.

The 2004–05 BEACH survey, capturing information on general practice activity in Australia, shows that referrals made to allied health professionals accounted for 21% of all GP referrals in 2004–05. Almost 40% of such referrals were to physiotherapists, followed by podiatrists/chiropodists (8.3%), psychologists (8.1%) and dietitians/nutritionists (7.0%) (Table 7.24). The rate of referral to physiotherapists was 1.1 referrals per 100 encounters. There were 0.2 referrals per 100 encounters to podiatrists/chiropodists, psychologists, dietitians/nutritionists and dentists.

Table 7.24: The 10 most frequent GP referrals to allied health professionals, 2004–05

Allied health professional	Per cent of all referrals	Per cent of allied health referrals	Rate per 100 encounters
Physiotherapist	9.9	38.5	1.1
Podiatrist/chiropodist	2.1	8.3	0.2
Psychologist	2.1	8.1	0.2
Dietitian/nutritionist	1.8	7.0	0.2
Dentist	1.7	6.5	0.2
Acoustic testing	0.9	3.5	0.1
Counsellor	0.7	2.7	0.1
Diabetes education	0.6	2.5	0.1
Optometrist	0.5	2.1	0.1
Drug and alcohol	0.5	1.9	0.1
Total	**20.9**	**81.1**	**2.2**

Source: AIHW: Britt et al. 2005.

From 1 July 2004, Medicare rebates have been available for a maximum of five allied health services per year for eligible patients; that is, 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 2004–05, about 284,000 allied health and dental care services were provided under these arrangements, with total benefits of around $11.5 million being paid through Medicare.

Medicare also covers the cost of visits to an optometrist. In 2004–05 there were 5.1 million optometry services provided, with $216 million in Medicare benefits being paid.

Most private health ancillary (or 'extras') insurance offers rebates for allied health services. In the quarter ending September 2005 there were benefits paid for approximately 1.7 million physiotherapy services, 1.2 million optical services, 463,000 chiropodist/podiatrist services, 122,000 psychologist/group therapy services and 85,000 speech therapy services (PHIAC 2006).

7.10 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, where St John Ambulance Australia is contracted by the state government 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 multi-causality events. Some government ambulance services also provide first aid training courses, as do non-government providers such as St John Ambulance and the Australian Red Cross.

In 2004–05, ambulance service organisations attended 2.4 million incidents nationally, of which 43.4% were emergency incidents, 35.0% were non-emergency incidents and 21.2% were urgent incidents (SCRGSP 2006).

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). Nationally in 2004–05, there were 118 incidents, 139 responses, and 113 patients per 1,000 people. Between 2003–04 and 2004–05, there were increases in all three categories: number of incidents up 16.0%, responses 3.7%, and the number of patients 3.1%.

The Royal Flying Doctor Service provides emergency health services, primary 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, and transfers of patients between rural and remote area hospitals and metropolitan hospitals.

In 2003–04 there were over 46,000 patient contacts conducted by the Royal Flying Doctor Service, 49% (23,000) of which involved patients attending health care 'clinics', 36% (17,000) where the patient received a telehealth consultation and 15% (7,000) where patients were transported by aerial evacuations, including inter-hospital transfers. Almost 400 patient contacts involved immunisations and there were more than 3,000 clinics conducted over this period. There were 10 aircraft used by the Royal Flying Doctor Service during the 2003–04 period, which flew a total of 3.7 million kilometres (RFDS 2004).

7.11 Community health services

Government-funded community health services in each state and territory of Australia 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 2006). Statistical information on these services is not developed and there is no nationally agreed basis for describing the nature of the services or for measuring the amounts provided. Therefore, a comprehensive national picture of community health services is not available. However, some information on the nature of the services follows.

All jurisdictions provide maternal and child health services (SCRGSP 2006). These include parenting support programs (including antenatal and postnatal programs), early childhood programs, disease prevention programs, and early intervention and treatment programs related to child development and health.

All jurisdictions also provide women's health services and health services for adolescents or youth. Other specific population groups for which services are provided by some jurisdictions include families, men, older persons, Aboriginal and Torres Strait Islander peoples, and multicultural communities.

Some services are directed specifically at particular conditions or needs, such as diabetes, other chronic diseases, continence and sexual health.

The types of services provided include health promotion, education and early intervention, primary health care, home nursing, nutrition services, allied health services such as physiotherapy, post-hospital discharge programs, rehabilitation services, palliative care and coordination of care between providers such as hospitals, GPs and community health service providers.

Services are delivered in a number of different settings, such as community health centres, local council buildings, schools and clients' homes.

7.12 Palliative care services

Palliative care is specialised care for people who are terminally ill, with associated support for their families and friends. It is a holistic approach to end-of-life care that emphasises quality of life and the relief of suffering. Palliative care providers may care for patients and their families directly, or may support other health care providers to adopt a palliative approach.

In 2003–04 there were almost 25,000 hospital separations for which the care type was palliative care, or about 0.4% of total separations in that year. About three-quarters of these separations were from public hospitals. The average length of stay for a palliative care episode was 12.8 days in public hospitals and 10.7 days in private hospitals. Just over half (52%) of the episodes ended with the patient dying, but a substantial portion (38%) were completed by discharge from the hospital, generally to the patient's own home (AIHW 2005b).

At present, there is no nationally consistent information available about community-based palliative care provision as distinct from hospital care. However recent data development work has led to a trial palliative care agency data collection. The trial was conducted in 2005 and received data from 180 palliative care agencies. Of these, 59% (107 agencies) reported that they mostly provided care in community-based settings, 28% (51 agencies) mostly in admitted patient settings and the remaining 12% (22 agencies) in both settings (AIHW forthcoming).

7.13 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 2005d). It is funded by the Australian Government and administered through Diabetes Australia, which coordinates the supply of products in all states and territories.

There were 717,978 persons with diabetes registered with the scheme as at 30 June 2005, an increase of approximately 9% over the previous financial year (Diabetes Australia 2005). Currently, there are around 5,900 new registrants to the NDSS each month. Of those persons registered at 30 June 2005, the majority (69.5%) did not use insulin. Among registrants who used insulin, almost 60% had Type 1 diabetes and 36% had Type 2 (see Chapter 2).

In 2004–05, subsidies were provided for over 3 million supplies of diagnostic reagents, 0.6 million needle and syringe supplies and 13,000 new insulin pump consumables, at a total cost of $103 million (Diabetes Australia 2005). This represents an increase of 27% from the $81.4 million spent on the scheme in 2002–03.

7.14 Hearing services

Public hearing services are provided through the Australian Government's Office of Hearing Services. The Office issues vouchers to eligible clients—persons aged 21 years or over who are Pensioner Concession Card holders or their dependants, 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 present the voucher to an accredited service provider to obtain services such as hearing assessment; audiological rehabilitation and maintenance; prescription, selection and fitting of hearing devices; and subsidised battery supply and device repair. There is no charge for hearing devices provided under the voucher program, although an annual maintenance fee applies, and clients can pay extra for a device with more features.

In 2004–05, more than 192,000 clients were issued with a voucher and there were almost 659,000 voucher hearing services provided (Table 7.25). Most of these were maintenance services (51%), assessment services (27%) and fittings (19%).

Between 1999–00 and 2004–05, the overall number of services increased by 36%, mainly due to increases in maintenance services and assessment services. Although the numbers of most service types increased, the number of new monaural hearing aid fittings decreased by 29%, from around 19,000 to under 14,000.

In addition, under its Community Services Obligation program, Australian Hearing provides services to persons under the age of 21 years, Aboriginal and Torres Strait Islander people aged 50 years or over, participants in Community Development Employment Projects and adults with special needs—for example, persons with complex hearing rehabilitation needs and persons living in remote locations. In 2004–05, services were provided to more than 24,000 persons under the age of 21 years, and to almost 12,000 adults with special needs (Office of Hearing Services, unpublished data). Of the 36,000 persons provided with services, over 3,000 (8.8%) identified as Aboriginal or Torres Strait Islander.

Table 7.25: Hearing services provided through the voucher system, 2004–05

Type of service	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05
Assessments						
New	57,900	57,600	63,400	69,500	78,700	82,500
Return	55,200	53,800	61,100	68,900	81,600	94,100
Total assessments	*113,000*	*111,300*	*124,500*	*138,500*	*160,300*	*176,500*
Hearing aid fitted						
New monaural fit	19,100	17,400	16,500	15,900	14,500	13,600
New binaural fit	30,900	29,300	34,000	39,400	44,900	50,500
Subsequent binaural	9,600	9,400	10,700	11,000	11,000	11,300
Return monaural fit	18,000	16,000	16,000	17,100	19,000	18,600
Return binaural fit	22,300	18,900	18,800	22,300	29,800	33,500
Total hearing aids fitted	*99,900*	*90,900*	*96,000*	*105,600*	*119,100*	*127,500*
Replacements	13,000	14,700	16,300	17,600	16,900	18,000
Maintenance	257,700	263,000	288,300	303,400	322,600	336,900
Total	**483,700**	**479,900**	**525,100**	**565,000**	**618,900**	**658,900**

Note: Totals may not be the sum of the rows due to rounding.
Source: Office of Hearing Services, unpublished data.

7.15 Family planning

A range of clinical, community education and professional training services in sexual and reproductive health are 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. Family planning organisations provide these services to clients who choose not to use, or do not have access to, mainstream health services, including young people, migrant populations, the homeless and people with disabilities.

Between January and June 2005, over 30,000 people attended clinical services provided by family planning organisations who were members of Sexual Health and Family

Planning Australia (SH&FPA 2005). During this same period about 19,000 health and human service professionals participated in reproductive health workforce education and training programs run by these organisations, and about 81,000 people participated in sexual and reproductive health promotion activities.

Another service available is the Family Planning Australia Healthline, a telephone and e-mail reproductive and sexual health information service. In 2004–05 this service was used on about 15,700 occasions, with an average of 43 occasions of service per day. Around 18% of callers were aged under 24 years and 41% were aged 25–39 years. Of those people making the call, 77% were calling with their own inquiry. The most common topics of inquiry were information on Family Planning Australia/family planning organisations information (for example, where to find a clinic), oral contraceptives, female reproductive health, and pregnancy.

Induced abortions

From Medicare claims data and the National Hospital Morbidity Database, the estimated number of induced abortions in Australia in 2003 was around 84,000, corresponding to a rate of 19.7 per 1,000 females aged 15–44 years (AIHW NPSU: Grayson et al. 2005). Abortion rates were highest in females aged 20–24 years (25.9%), with 32.7 induced abortions per 1,000 females in this age group. Females aged 40–44 years had the lowest rate (6.7 per 1,000). Females living in major cities accounted for the bulk of induced abortions (76.2%), being over-represented with respect to the population (66.3% living in major cities).

7.16 Complementary and alternative health services

Australians are able to use a range of services that either complement or are alternative to mainstream health care services. The 2004–05 National Health Survey asked respondents if they had consulted an 'other health professional' in the two weeks before the interview. Results suggest that in any two-week period 3.7% of the population (0.7 million) consulted a complementary or alternative health professional: 4.6% of females (0.5 million) and 2.8% of males (0.3 million) (Table 7.26). About 2.2% (0.4 million) of Australians consulted a chiropractor, 0.7% (0.1 million) a naturopath and about 0.2 million an acupuncturist, herbalist, hypnotherapist or osteopath in a two-week period.

In the 2000–01 BEACH study on general practice consultations, a substudy found that the use of complementary or alternative therapies in Australia was high compared to world standards. Almost 22% of patients indicated that they used such therapies in the previous 12 months, and almost half would consider doing so in the future (Valenti et al. 2002). Of those who had used complementary/alternative therapies in the previous 12 months, 40% had seen a chiropractor, 32% a naturopath, 23% had had remedial massage and 21% had had acupuncture. The vast majority of problems managed by chiropractors were musculoskeletal (91%), as were those managed by remedial massage (73%) and acupuncture (65%). Problems managed by naturopaths appeared to be more general in nature, with 39% classified as either preventive/health maintenance or general weakness/tiredness.

Table 7.26: 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 two weeks before 2004–05 NHS interview. Excludes consultations in/at hospitals or day clinics.

(b) Includes acupuncturist, herbalist, hypnotherapist and osteopath.

(c) Total will not necessarily be the sum of the rows, as some persons reported more than one type of professional.

Source: ABS unpublished data.

A study conducted in South Australia in 2004 generally confirmed these results (MacLennan et al. 2006). With the exception of herbal therapists and other alternative therapists, there had been no increase in the use of complementary and alternative health services in South Australia since 2000. The overall cost of such services in South Australia, however, had decreased over this period by approximately 20%, from $616 million in 2000 to $494 million in 2004. This decline in expenditure suggests that while the number of people using these services has remained stable, the frequency of attendance has decreased.

Complementary and alternative health services have been variably incorporated into the general health care system. For example, acupuncture performed by a medical practitioner attracts a Medicare rebate, for which a total of 0.6 million claims were made in 2004–05, attracting benefits paid of $20.0 million. Some private health ancillary insurance covers some of these services, such as those provided by naturopaths, osteopaths, chiropractors and acupuncturists. In the quarter ending September 2005 there were benefits paid for approximately 1.8 million chiropractic services, 0.5 million natural therapy services, 0.3 million acupuncture/acupressure services and 51,000 osteopathic services.

7.17 Aids and equipment

Aids and equipment are used by some people to improve their functioning and therefore their quality of life. The 2003 Survey of Disability, Ageing and Carers estimated that there were almost 4.0 million people with some degree of disability in Australia, accounting for approximately 20% of the population (AIHW 2005e). About 1.9 million of these made use of aids and equipment to assist them in their daily living (Table 7.27). Of the aids and equipment used, 26.3% (1,030,000) were to assist with self-care, 25.1% (982,300) were medical aids and 23.4% (913,700) were to improve mobility.

People aged 65 years or over with a disability reported the highest average number of aids used (2.6 per person), followed by those aged 45–64 years (1.7 per person). Medical aids were most commonly used by all age groups except those aged 65 years or over, for whom self-care aids (33%) and mobility aids (29%) were mostly used. Communication aids were commonly used among younger people with a disability: by 27% of children, 24% of those aged 15–29 years and 21% of those aged 30–44 years.

Table 7.27: Aids and equipment used by people with a disability, 2003

	0–14 years		15–29 years		30–44 years		45–64 years		65+ years		All ages	
Type of aid / equipment	**No. ('000)**	**Per cent**	**No. ('000)**	**Per cent**	**No. ('000)**	**Per cent**	**No. ('000)**	**Per cent**	**No. ('000)**	**Per cent**	**No. ('000)**	**Per cent**
Self-care	24.8	16.8	19.7	11.5	45.4	14.1	154.8	17.8	785.2	32.7	1,030.0	26.3
Mobility	11.6	7.8	12.9	7.5	43.8	13.7	145.9	16.8	699.5	29.1	913.7	23.4
Communication	39.2	26.6	41.6	24.3	67.6	21.0	148.8	17.1	175.9	7.3	473.2	12.1
Hearing	10.2	6.9	11.7	6.8	14.6	4.5	72.7	8.4	344.3	14.3	453.4	11.6
Meal preparation	*2.5	*1.7	*4.2	*2.4	*8.2	*2.6	17.3	2.0	28.0	1.2	60.2	1.5
Medical	59.4	40.2	81.3	47.4	141.5	44.1	328.9	37.9	371.3	15.4	982.3	25.1
Total aids used	**147.6**	**100.0**	**171.4**	**100.0**	**321.2**	**100.0**	**868.3**	**100.0**	**2,404.1**	**100.0**	**3,912.7**	**100.0**
Number of users	104.8	71.0	125.5	73.2	207.1	64.5	525.5	60.5	923.4	38.4	1,886.2	48.2
Average no. of aids	1.4		1.4		1.6		1.7		2.6		2.1	

* Estimate has a relative standard error of 25% and 50% and should be used with caution.

Note: Numbers and per cent refer to aids and equipment, not counts of people with a disability.

Sources: AIHW 2005e; AIHW analysis of ABS 2003 Survey of Disability, Ageing and Carers.

Arthritis and musculoskeletal conditions are large contributors of illness, pain and disability in Australia, with more than 6.1 million people reported to have arthritis or a musculoskeletal condition (AIHW 2005f). An estimated 1.2 million Australians had a disability associated with these conditions, and many made use of aids and equipment to assist them in their daily living. In 2003, aids for showering (12.7%), toileting (7.5%), dressing (3.1%) and meal preparation (2.8%) were those most commonly used (Table 7.28).

Table 7.28: Use of aids and equipment in core activities for disability associated with arthritis and related disorders, 2003

	Males		Females		Persons	
Core activity[(a)]	**No. ('000)**	**Per cent**	**No. ('000)**	**Per cent**	**No. ('000)**	**Per cent**
Showering	18.2	10.7	52.9	13.5	71.1	12.7
Toileting	12.0	7.1	30.0	7.7	42.0	7.5
Dressing	7.1	4.2	10.1	2.6	17.2	3.1
Eating	0.4	0.2	2.9	0.7	3.3	0.6
Meal preparation	1.2	0.7	14.4	3.7	15.6	2.8
Transferring to/from bed/chair	9.2	5.4	21.3	5.5	30.5	5.4
Other	28.5	16.8	76.8	19.7	105.3	18.8

(a) The proportions are based on the total number of people with a disability associated with arthritis and related disorders.

Sources: AIHW 2005f; AIHW analysis of ABS 2003 Survey of Disability, Ageing and Carers.

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Statistical tables

Population

Table S1: Estimated resident population, selected years, 1901 to 2005

Age group	1901	1921	1941	1961	1981	2001	2005[(a)]
Males							
0–4	172,957	307,300	299,900	573,700	583,218	657,499	648,825
5–14	450,067	570,800	575,300	1,056,600	1,321,340	1,386,873	1,392,226
15–24	366,146	457,900	627,900	776,100	1,320,618	1,351,444	1,444,461
25–34	320,455	451,800	593,900	728,000	1,244,663	1,427,829	1,439,381
35–44	279,558	369,500	496,000	737,900	931,360	1,475,870	1,497,245
45–54	156,674	281,300	432,400	627,800	772,879	1,327,595	1,387,951
55–64	99,170	208,400	307,600	427,800	661,984	926,870	1,101,882
65–74	64,716	90,900	173,100	266,300	426,174	639,144	682,453
75–84	18,731	29,300	70,900	102,300	158,247	355,606	414,572
85+	2,207	4,700	7,500	15,800	27,784	81,922	101,840
All ages	**1,977,928**	**2,771,900**	**3,584,500**	**5,312,300**	**7,448,267**	**9,630,652**	**10,110,836**
Females							
0–4	168,836	296,300	288,700	546,400	556,400	624,858	615,682
5–14	441,003	557,300	556,000	1,008,300	1,264,582	1,317,968	1,321,488
15–24	365,792	462,800	614,900	729,300	1,278,293	1,303,713	1,375,373
25–34	293,424	458,400	573,300	664,400	1,212,261	1,445,867	1,430,549
35–44	216,135	353,200	471,900	706,100	891,517	1,495,591	1,510,932
45–54	118,574	257,400	436,400	595,700	737,394	1,331,776	1,406,217
55–64	80,302	179,300	307,600	435,500	691,752	903,953	1,088,396
65–74	48,935	82,000	186,400	333,100	511,502	681,749	716,378
75–84	14,757	31,000	79,700	149,200	256,487	493,800	539,571
85+	2,038	5,500	10,500	27,900	74,805	183,313	213,187
All ages	**1,795,873**	**2,683,200**	**3,525,400**	**5,195,900**	**7,474,993**	**9,782,588**	**10,217,773**

(a) Preliminary data.

Note: Population estimates are for 30 June of each year.

Sources: ABS cat. no. 3201.0; AIHW National Population Database.

Fertility and pregnancy

Table S2: Age-specific fertility rates[a] and total fertility rates[b], 1921 to 2004 (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
Annual rates								
2001	17.7	58.0	104.4	107.9	49.0	9.2	0.4	1,729
2002	17.4	56.5	104.7	111.3	52.2	9.7	0.4	1,759
2003	16.3	54.5	102.9	112.5	54.3	10.0	0.5	1,754
2004	16.3	53.4	102.5	114.4	57.4	10.6	0.5	1,774

(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 five-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, 2004 (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	15.1	54.8	104.3	114.1	59.0	11.2	0.6	1,794
Vic	10.6	40.3	94.2	121.4	62.5	11.3	0.5	1,701
Qld	21.7	63.6	108.8	107.3	50.9	9.3	0.4	1,811
WA	19.7	58.7	105.1	114.4	53.8	9.1	0.4	1,807
SA	13.8	49.1	100.4	112.7	54.0	10.4	0.7	1,708
Tas	24.8	76.2	122.4	104.9	47.2	7.5	0.1	1,923
ACT	8.1	30.0	81.5	120.3	70.7	15.4	1.2	1,637
NT	57.8	104.6	114.4	99.4	58.9	12.1	0.6	2,239
Australia	**16.3**	**53.4**	**102.5**	**114.4**	**57.4**	**10.6**	**0.5**	**1,774**

(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 five-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 rates[(b)] and male:female birth ratio, selected countries (latest available year)

	Total fertility rate		Crude birth rate		M:F birth ratio	
Country	Year	Rate	Year	Rate	Year	Rate
Australia	**2004**	**1,774**	**2004**	**12.7**	**2004**	**105.6**
Australia	***2003***	***1,754***	***2003***	***12.6***	***2002***	***105.1***
Canada	2002	1,520	2003	10.5	2000	105.6
Czech Republic	2003	1,180	2003	9.2	2002	105.9
Denmark	2003	1,760	2003	12.1	1999	104.8
Finland	2003	1,760	2003	10.9	2002	105.8
France	2003	1,890	2003	12.7	2000	105.3
Germany	2003	1,340	2002	8.7	2001	105.8
Greece	2003	1,270	2001	9.2	2001	107.0
Hungary	2003	1,300	2003	9.4	2002	105.5
Ireland	2003	1,980	2003	15.5	2001	105.9
Italy	2003	1,290	2002	9.4	2001	105.8
Japan	2003	1,380	2003	8.8	2002	105.7
Korea, Republic of	2002	1,170	2003	10.3	2002	110.0
Netherlands	2003	1,750	2003	12.4	2003	105.6
New Zealand	2002	1,900	2003	14.0	2000	106.0
Norway	2003	1,800	2003	12.3	2001	105.0
Poland	2003	1,240	2003	9.2	2002	106.1
Portugal	2003	1,440	2003	10.8	2002	107.7
Slovak Republic	2003	1,170	2003	9.7	2000	104.8
Spain	2003	1,290	2002	10.1	2001	105.7
Sweden	2003	1,710	2003	11.1	2001	106.3
Switzerland	2003	1,410	2003	9.8	2000	106.2
United Kingdom	2003	1,710	2002	11.3	2002	105.4
United States	2003	2,040	2003	13.9	2000	104.8

(a) Total fertility rate is obtained by summing the five-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.

(b) Live births per 1,000 mid-year population.

Sources: ABS cat. no. 3301.0; OECD 2005; WHO 2005.

Table S5: Birthweight distribution of live births, states and territories, 2003

Births/birthweight	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Births					**Number**				
Less than 2,500 g	5,013	4,046	3,230	1,568	1,149	419	311	350	16,086
All live births	85,891	63,018	50,059	24,497	17,710	5,482	4,821	3,621	255,099
Birthweight (g)					**Per cent**				
Less than 1,000	0.4	0.5	0.5	0.4	0.5	0.5	0.8	0.6	0.5
1,000–1,499	0.5	0.6	0.7	0.5	0.6	0.8	0.4	0.7	0.6
1,500–1,999	1.2	1.3	1.3	1.3	1.3	1.9	1.5	1.6	1.3
2,000–2,499	3.7	4.0	4.0	4.2	4.1	4.5	3.8	6.7	4.0
Less than 2,500	*5.8*	*6.4*	*6.5*	*6.4*	*6.5*	*7.6*	*6.5*	*9.7*	*6.3*
2,500–2,999	14.9	15.3	14.6	15.6	15.2	14.2	13.9	20.4	15.1
3,000–3,499	35.8	35.9	34.6	37.2	36.1	33.3	35.0	35.6	35.7
3,500–3,999	31.4	30.4	31.4	29.9	30.5	31.3	30.3	25.1	30.8
4,000–4,499	10.2	10.2	10.9	9.2	9.9	11.2	12.0	7.9	10.3
4,500 and over	1.8	1.8	2.0	1.7	1.9	2.2	2.3	1.4	1.8

Source: AIHW NPSU: Laws & Sullivan 2005.

Table S6: Infant mortality rates, states and territories, selected years 1901 to 2004 (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
2002	4.6	5.0	5.8	4.3	5.1	6.2	3.4	11.3	5.0
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

Source: ABS cat. no. 3302.0.

Table S7: Perinatal mortality rates[(a)], by age group of mother, 1991 and 2001 to 2004 (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
2002	12.4	9.0	7.3	6.5	7.9	12.7	8.0
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

(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: Perinatal mortality rates[(a)], states and territories, 1991 and 2001 to 2004 (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
2002	7.2	8.3	8.8	7.1	8.3	12.9	5.6	10.4	8.0
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

(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 S9: Neonatal, postneonatal and infant mortality rates[(a)], selected countries (latest available year) (per 1,000 live births)

	Males			Females		
Country/year	Neonatal	Post-neonatal	Infant	Neonatal	Post-neonatal	Infant
Australia (2004)	**3.6**	**1.6**	**5.2**	**2.8**	**1.3**	**4.1**
Australia (2002)	***3.6***	***1.8***	***5.4***	***3.2***	***1.4***	***4.6***
Canada (2000)	4.0	1.8	5.8	3.2	1.5	4.7
Czech Republic (2002)	2.9	1.7	4.6	2.5	1.2	3.7
Denmark (2002)	n.a.	n.a.	4.8	n.a.	n.a.	4.7
Finland (2002)	2.2	0.8	3.0	2.0	0.9	2.9
France (2000)	3.1	1.9	5.0	2.4	1.3	3.7
Germany (2001)	3.0	1.8	4.8	2.3	1.4	3.8
Greece (2001)	4.1	1.7	5.9	3.0	1.4	4.4
Hungary (2002)	5.4	1.9	7.3	5.1	2.0	7.0
Ireland (2001)	4.4	2.0	6.3	4.0	1.7	5.7
Italy (2001)	3.7	1.3	5.0	3.1	1.2	4.3
Japan (2002)	1.8	1.4	3.2	1.6	1.3	2.8
Korea, Republic of (2000)	n.a.	n.a.	4.5	n.a.	n.a.	4.4
Netherlands (2003)	4.1	1.4	5.5	3.1	1.0	4.1
New Zealand (2000)	4.2	3.0	7.2	3.7	2.2	5.9
Norway (2001)	3.3	1.2	4.4	2.6	1.0	3.7
Poland (2002)	5.8	2.4	8.2	4.9	2.0	6.8
Portugal (2002)	3.6	1.8	5.4	3.3	1.4	4.7
Slovak Republic (2000)	6.1	3.8	9.9	4.6	2.6	7.2
Spain (2001)	3.0	1.4	4.4	2.5	1.2	3.7
Sweden (2001)	2.8	1.2	4.0	2.2	1.1	3.3
Switzerland (2000)	3.9	1.4	5.3	3.3	1.2	4.4
United Kingdom (2002)	4.0	2.0	5.9	3.1	1.4	4.5
United States (2000)	5.1	2.5	7.6	4.2	2.0	6.2

(a) Neonatal: less than 28 days. Postneonatal: 28 to 364 days. Infant: Less than 1 year.

Sources: ABS cat. no. 3302.0; WHO 2005.

Mortality

Table S10: Life expectancy (years) at selected ages, 1901–1910 to 2002–2004

	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
2001–2003	77.8	82.8	53.8	58.5	17.6	21.0
2002–2004	78.1	83.0	54.1	58.7	17.8	21.1

Sources: ABS cat. no. 3302.0; AIHW National Population Database.

Table S11: Life expectancy (years) at selected ages, states and territories, 2002–2004

	At birth		At age 25		At age 65	
State/territory	Males	Females	Males	Females	Males	Females
New South Wales	78.0	83.3	54.0	59.0	17.7	21.2
Victoria	78.5	83.3	54.5	59.0	17.9	21.2
Queensland	77.8	82.9	54.0	58.7	17.8	21.1
Western Australia	78.6	83.3	54.6	59.0	18.1	21.5
South Australia	78.0	83.1	53.9	58.8	17.7	21.3
Tasmania	76.7	81.8	52.9	57.5	16.8	20.2
Australian Capital Territory	79.7	83.9	55.7	59.7	18.6	21.5
Northern Territory	72.3	78.0	49.4	54.4	16.4	19.0
Australia	**78.1**	**83.0**	**54.1**	**58.7**	**17.8**	**21.1**

Source: ABS cat. no. 3302.0.

Table S12: Life expectancy (years) at selected ages, selected countries, 2001

	At birth		At age 25–29		At age 65–69	
Country	**Males**	**Females**	**Males**	**Females**	**Males**	**Females**
Australia	77.4	82.6	53.5	58.4	17.3	20.8
Canada	76.6	81.9	52.6	57.6	16.5	20.4
Czech Republic	71.9	78.8	47.8	54.4	13.8	17.4
Denmark	74.8	79.5	50.7	55.1	15.3	18.5
Finland	74.5	81.2	50.4	56.8	15.6	19.5
France	75.6	82.9	51.6	58.6	16.8	21.3
Germany	75.1	81.1	51.0	56.7	15.7	19.4
Greece	75.5	80.8	51.7	56.5	16.3	18.7
Hungary	67.3	76.1	43.5	52.0	12.7	16.7
Ireland	73.8	79.2	49.9	55.0	14.2	17.8
Italy	76.2	82.2	52.2	57.8	16.2	20.1
Japan	77.9	84.7	53.6	60.3	17.6	22.5
Korea, Republic of	71.2	78.7	47.3	54.6	13.6	17.4
Netherlands	75.8	80.7	51.7	56.4	15.5	19.3
New Zealand	76.1	80.9	52.3	56.8	16.5	19.9
Norway	76.1	81.4	52.1	57.0	16.0	19.7
Poland	69.9	78.1	46.1	54.0	13.7	17.5
Portugal	72.7	80.1	49.0	56.0	14.9	18.8
Slovak Republic	69.3	77.4	45.6	53.3	13.0	16.6
Spain	75.3	82.6	51.2	58.2	16.1	20.5
Sweden	77.7	82.3	53.4	57.8	16.9	20.3
Switzerland	77.3	82.8	53.3	58.5	17.2	20.9
United Kingdom	75.1	79.9	51.1	55.6	15.4	18.6
United States	74.3	79.5	50.8	55.5	16.4	19.2

Source: WHO 2005.

Table S13: Age-specific, crude and age-standardised death rates, all causes by sex, selected years, 1921 to 2004 (per 100,000 population)

Sex/age group (years)	1921	1941	1961	1981	1991	2001	2004
Males							
0–4	2,213	1,289	564	281	191	137	127
5–9	200	139	49	34	20	14	13
10–14	172	108	52	29	22	16	15
15–19	219	159	123	124	88	66	50
20–24	321	205	161	153	128	101	83
25–29	373	199	146	133	127	108	94
30–34	442	232	169	123	133	121	116
35–39	584	339	229	165	161	137	117
40–44	730	461	380	261	198	172	167
45–49	994	737	588	455	313	251	240
50–54	1,299	1,161	992	790	517	361	361
55–59	1,895	1,775	1,614	1,294	885	631	542
60–64	2,878	2,774	2,619	1,983	1,543	1,034	927
65–69	4,199	4,251	4,117	3,231	2,489	1,712	1,516
70–74	6,199	6,479	6,252	5,195	3,927	2,907	2,666
75–79	10,076	10,054	9,312	8,018	6,547	4,875	4,484
80–84	15,368	15,264	14,084	12,112	10,548	8,041	7,643
85+	26,213	29,453	23,772	20,814	17,571	16,040	15,636
Crude rate	**1,106**	**1,099**	**946**	**815**	**744**	**694**	**685**
Age-standardised rate(a)	**1,987**	**1,853**	**1,600**	**1,318**	**1,056**	**824**	**770**
Females							
0–4	1,771	1,022	443	216	151	107	101
5–9	192	103	38	18	14	10	8
10–14	128	73	30	20	15	10	10
15–19	205	104	47	45	37	24	28
20–24	290	155	61	48	45	36	33
25–29	377	202	74	51	54	36	36
30–34	426	234	92	57	54	48	42
35–39	535	311	146	87	77	70	64
40–44	563	374	209	143	111	106	94
45–49	690	565	347	265	187	150	155
50–54	943	780	542	378	307	237	213
55–59	1,289	1,103	785	617	484	381	337
60–64	1,915	1,805	1,298	971	797	569	542
65–69	3,112	2,884	2,178	1,568	1,305	952	900
70–74	5,041	4,789	3,652	2,552	2,187	1,683	1,468
75–79	8,295	8,275	6,271	4,426	3,797	2,844	2,723
80–84	13,136	12,704	10,241	7,597	6,487	5,290	5,108
85+	22,345	25,457	20,670	16,035	14,351	13,045	12,893
Crude rate	**873**	**901**	**745**	**646**	**635**	**631**	**635**
Age-standardised rate(a)	**1,602**	**1,452**	**1,058**	**772**	**658**	**535**	**511**

(a) Age-standardised to the total Australian population as at 30 June 2001.

Source: AIHW Mortality Database.

Table S14: Age-specific, crude and age-standardised death rates, all causes by state and territory of usual residence, 2004 (per 100,000 population)

Sex/age group (years)	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Males									
0–4	124	115	152	129	90	84	155	279	127
5–9	11	10	13	25	12	24	9	12	13
10–14	13	11	17	22	12	17	9	59	15
15–19	40	44	56	74	44	80	17	144	50
20–24	65	81	95	92	86	123	83	243	83
25–29	83	79	107	105	118	113	62	299	94
30–34	103	106	129	106	131	186	94	375	116
35–39	105	100	126	143	119	115	42	526	117
40–44	162	150	187	149	179	193	165	393	167
45–49	226	212	279	243	275	214	166	516	240
50–54	375	327	384	301	410	383	280	578	361
55–59	555	513	548	484	578	640	452	966	542
60–64	959	842	980	917	901	1,057	699	1,212	927
65–69	1,561	1,417	1,602	1,297	1,632	1,602	1,313	2,189	1,516
70–74	2,813	2,521	2,600	2,580	2,472	3,273	2,658	4,146	2,666
75–79	4,475	4,473	4,511	4,085	4,599	5,457	4,359	4,697	4,484
80–84	7,737	7,443	7,877	7,516	7,301	8,647	6,940	7,859	7,643
85+	15,785	15,497	15,848	14,713	15,562	17,932	14,719	9,398	15,636
Crude rate	**712**	**671**	**671**	**590**	**781**	**848**	**461**	**533**	**685**
Age-standardised rate[(a)]	**776**	**740**	**792**	**731**	**771**	**889**	**698**	**947**	**770**
Females									
0–4	109	95	113	71	63	69	182	189	101
5–9	7	6	9	8	9	0	10	50	8
10–14	10	9	7	12	8	36	19	0	10
15–19	26	27	26	36	30	30	17	58	28
20–24	27	28	31	40	53	48	30	138	33
25–29	29	30	36	50	46	52	47	124	36
30–34	39	45	39	44	36	68	23	99	42
35–39	60	52	68	78	50	102	65	265	64
40–44	93	88	99	85	97	85	55	292	94
45–49	147	132	166	170	173	234	170	299	155
50–54	220	207	210	190	225	253	129	327	213
55–59	355	317	334	327	354	295	264	550	337
60–64	573	491	550	505	521	572	659	1,014	542
65–69	935	853	891	897	877	933	788	2,020	900
70–74	1,533	1,349	1,556	1,360	1,402	1,614	1,450	2,734	1,468
75–79	2,756	2,666	2,765	2,612	2,603	3,490	2,092	4,073	2,723
80–84	5,087	5,127	5,179	5,093	4,952	5,429	4,749	5,920	5,108
85+	12,996	12,875	13,360	11,903	12,528	14,080	11,395	8,451	12,893
Crude rate	**670**	**640**	**590**	**541**	**736**	**767**	**417**	**350**	**635**
Age-standardised rate[(a)]	**518**	**497**	**524**	**489**	**498**	**572**	**461**	**689**	**511**

(a) Age-standardised to the total Australian population as at 30 June 2001.

Source: AIHW Mortality Database.

Table S15: Age-specific, crude and age-standardised death rates, selected 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 (2004)	***519***	***28***	***14***	***66***	***106***	***143***
Australia (2001)	**595**	**27**	**15**	**84**	**112**	**153**
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
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, Republic of (2002)	547	46	23	56	98	251
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
United Kingdom (2002)	592	26	14	67	101	165
United States (2000)	757	36	21	115	139	255

(*continued*)

Table S15 (continued): Age-specific, crude and age-standardised death rates, selected 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 (2004)	***298***	***708***	***2,034***	***7,574***	***684***	***404***
Australia (2001)	**305**	**810**	**2,272**	**7,917**	**694**	**438**
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
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, Republic of (2002)	597	1,382	3,263	10,236	561	619
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
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 S15 (continued): Age-specific, crude and age-standardised death rates, selected 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 (2004)	***409***	***23***	***9***	***30***	***39***	***79***
Australia (2001)	**434**	**23**	**9**	**29**	**42**	**87**
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
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, Republic of (2002)	479	39	17	30	47	94
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
United Kingdom (2002)	450	21	11	27	45	97
United States (2000)	622	29	15	43	64	143

(*continued*)

Table S15 (continued): Age-specific, crude and age-standardised death rates, selected 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 (2004)	***183***	***425***	***1,163***	***6,268***	***635***	***271***
Australia (2001)	**192**	**466**	**1,307**	**6,366**	**632**	**287**
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
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, Republic of (2002)	200	516	1,574	7,815	463	340
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
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 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: AIHW National Mortality Database; WHO 2005.

Table S16: Age-standardised death rates[a], selected years, 1921 to 2004 (per 100,000 population)

	1921	1941	1961	1971	1981	1991	2001	2003	2004
Males									
Infectious and parasitic[b]	216	98	19	10	6	7	11	11	11
Neoplasms	178	206	227	256	282	277	250	240	237
Blood diseases	11	6	5	5	4	9	2	2	2
Endocrine, nutritional[c]	18	27	19	26	21	24	27	28	29
Mental disorders	8	4	5	10	11	16	14	16	15
Nervous system diseases	47	28	16	14	15	20	24	23	23
Circulatory diseases	452	764	914	924	689	469	304	282	267
Respiratory diseases	239	178	131	148	121	97	74	76	71
Digestive diseases	65	65	45	36	43	35	25	26	25
Skin diseases	6	3	2	1	1	1	1	1	2
Musculoskeletal diseases	8	5	4	5	4	4	4	4	4
Genitourinary diseases	148	167	54	29	20	18	17	17	16
Perinatal diseases	49	39	18	15	6	5	4	4	3
Congenital diseases	8	9	9	8	6	5	3	3	3
Ill-defined conditions	411	141	21	9	7	5	3	5	6
Injury and poisoning	123	112	109	110	84	67	59	56	55
All causes	**1,987**	**1,853**	**1,600**	**1,606**	**1,318**	**1,056**	**824**	**792**	**770**
Females									
Infectious and parasitic[b]	159	59	10	6	4	4	7	7	7
Neoplasms	180	188	161	160	157	167	152	149	146
Blood diseases	14	7	6	4	3	3	2	2	2
Endocrine, nutritional[c]	29	45	24	26	19	18	18	19	20
Mental disorders	4	3	3	7	7	12	13	15	16
Nervous system diseases	39	24	10	10	9	14	20	20	20
Circulatory diseases	404	640	640	635	440	317	213	197	186
Respiratory diseases	184	140	56	52	40	42	42	45	44
Digestive diseases	64	46	28	22	24	24	18	18	18
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	13	12
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	22	23
All causes	**1,602**	**1,452**	**1,058**	**1,026**	**772**	**658**	**535**	**523**	**511**

(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 National Mortality Database.

Table S17: Age-standardised death rates[(a)], by sex and ICD-10 chapter, states and territories, 2004 (per 100,000 population)

Sex/age group (years)	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Males									
Infectious and parasitic[(b)]	12	10	9	11	11	10	11	31	11
Neoplasms	235	234	241	229	237	280	226	195	237
Blood diseases	3	2	2	3	2	3	6	10	3
Endocrine, nutritional[(c)]	26	31	28	30	27	39	27	60	29
Mental disorders	16	15	15	12	12	19	8	47	15
Nervous system diseases	23	23	23	25	21	40	28	13	23
Circulatory diseases	278	248	282	244	265	284	240	271	267
Respiratory diseases	72	69	70	62	83	76	56	92	71
Digestive diseases	27	23	26	24	25	23	23	50	25
Skin diseases	2	1	1	1	1	1	3	0	2
Musculoskeletal diseases	4	4	4	3	4	5	5	4	4
Genitourinary diseases	16	17	14	14	20	19	16	30	16
Perinatal diseases	3	3	4	3	2	2	5	7	3
Congenital diseases	3	4	3	2	2	3	6	3	3
Ill-defined conditions	6	5	6	15	3	5	4	17	6
Injury and poisoning	50	53	63	54	57	79	38	116	55
All causes	**776**	**740**	**792**	**731**	**771**	**889**	**698**	**947**	**770**
Females									
Infectious and parasitic[(b)]	8	6	6	6	7	5	4	11	7
Neoplasms	148	146	145	145	144	172	117	138	146
Blood diseases	2	2	2	3	1	5	1	3	2
Endocrine, nutritional[(c)]	16	24	19	22	20	29	17	52	20
Mental disorders	15	18	15	13	16	16	23	29	16
Nervous system diseases	19	19	20	27	18	25	28	10	20
Circulatory diseases	195	173	201	164	178	191	156	249	186
Respiratory diseases	47	40	44	39	47	45	41	67	44
Digestive diseases	17	17	19	19	20	14	18	35	18
Skin diseases	2	1	1	2	2	1	3	6	2
Musculoskeletal diseases	6	6	6	5	4	9	7	6	6
Genitourinary diseases	12	12	13	12	12	14	14	23	12
Pregnancy	—	—	—	—	—	—	—	—	—
Perinatal diseases	3	3	3	2	2	2	4	5	3
Congenital diseases	3	3	3	2	2	4	4	2	3
Ill-defined conditions	3	3	3	8	2	5	4	8	4
Injury and poisoning	22	24	24	22	23	35	21	47	23
All causes	**518**	**497**	**524**	**489**	**498**	**572**	**461**	**689**	**511**

(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 National Mortality Database.

Table S18: Age-standardised death rates[(a)], selected countries, latest year (per 100,000 population)

	ICD-10 cause					
	Malignant neoplasms	Diabetes mellitus	Circulatory	Bronchitis, emphysema & asthma	Accidents & adverse events	All causes
Males						
Australia (2004)	***128***	***11***	***126***	***16***	***27***	***412***
Australia (2001)	**138**	**10**	**144**	**20**	**29**	**446**
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
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, Republic of (2002)	183	27	137	31	50	619
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
United Kingdom (2002)	148	6	188	24	18	521
United States (2000)	144	16	200	27	41	584

(*continued*)

Table S18 (continued): Age-standardised death rates[(a)], selected countries, latest year (per 100,000 population)

	ICD-10 cause					
	Malignant neoplasms	Diabetes mellitus	Circulatory	Bronchitis, emphysema & asthma	Accidents & adverse events	All causes
Females						
Australia (2004)	***85***	***7***	***79***	***10***	***12***	***262***
Australia (2001)	**90**	**6**	**96**	**12**	**11**	**287**
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
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, Republic of (2002)	74	19	94	13	19	340
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
United Kingdom (2002)	109	4	122	16	8	368
United States (2000)	104	13	136	19	18	399

(a) Reference population is the WHO 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: AIHW National Mortality Database; WHO 2005.

Infectious diseases

Table S19: Notifiable diseases, 2002 to 2005

	Notifications				Rate per 100,000 population			
Disease	**2002**	**2003**	**2004**	**2005**	**2002**	**2003**	**2004**	**2005**
Bloodborne diseases								
Hepatitis B (incident)	382	358	280	243	1.9	1.7	1.4	1.2
Hepatitis B (unspecified)[(a)]	6,394	5,827	5,814	7,178	32.9	29.6	29.2	35.3
Hepatitis C (incident)	297	335	303	345	2.2	2.4	2.2	2.1
Hepatitis C (unspecified)[(a)(b)]	14,588	13,750	12,885	14,557	74.3	69.2	64.1	71.6
Hepatitis D	20	27	28	30	0.1	0.1	0.1	0.1
Hepatitis (nec)	—	—	—	1	—	—	—	—
Gastrointestinal diseases								
Botulism	—	1	1	3	—	—	—	—
Campylobacteriosis[(c)]	14,740	15,369	15,625	16,464	113.3	116.5	116.8	121.5
Cryptosporidiosis	3,265	1,224	1,683	3,202	16.6	6.2	8.4	15.8
Haemolytic uraemic syndrome	12	15	16	19	0.1	0.1	0.1	0.1
Hepatitis A	388	434	319	321	2.0	2.2	1.6	1.6
Hepatitis E	12	14	28	31	0.1	0.1	0.1	0.2
Listeriosis	62	70	67	54	0.3	0.4	0.3	0.3
Salmonellosis (nec)	7,696	7,017	7,830	8,453	39.2	35.3	38.9	41.6
Shigellosis	504	443	522	732	2.6	2.2	2.6	3.6
SLTEC, VTEC[(d)]	58	51	48	87	0.3	0.3	0.2	0.4
Typhoid	68	51	76	53	0.3	0.3	0.4	0.3
Other bacterial infections								
Legionellosis	313	334	311	327	1.6	1.7	1.5	1.6
Leprosy	6	5	7	8	—	—	—	—
Meningococcal infection	681	566	406	398	3.5	2.8	2.0	2.0
Tuberculosis	1,040	955	1,065	829	5.3	4.8	5.3	4.1
Quarantinable diseases								
Cholera	5	1	5	3	—	—	—	—
Plague	—	—	—	—	—	—	—	—
Rabies	—	—	—	—	—	—	—	—
Viral haemorrhagic fever (nec)	—	—	—	—	—	—	—	—
Yellow fever	—	—	—	—	—	—	—	—
Sexually transmissible infections								
Chlamydial infection	24,046	30,446	36,214	41,152	122.4	153.2	180.1	202.5
Donovanosis	16	16	10	13	0.1	0.1	—	0.1
Gonococcal infection	6,279	6,794	7,194	7,970	32.0	34.2	35.8	39.2
Syphilis	1,960	2,017	2,334	2,159	10.0	10.1	11.6	10.6
Syphilis—congenital	18	14	13	15	0.1	0.1	0.1	0.1

(*continued*)

Table S19 (continued): Notifiable diseases, 2002 to 2005

	Notifications				Rate per 100,000 population			
Disease	**2002**	**2003**	**2004**	**2005**	**2002**	**2003**	**2004**	**2005**
Vaccine-preventable diseases								
Diphtheria	—	—	—	—	—	—	—	—
Haemophilus influenzae type b	30	21	15	18	0.2	0.1	0.1	0.1
Influenza (laboratory confirmed)	3,654	3,487	2,133	4,628	18.6	17.5	10.6	22.8
Measles	32	93	45	10	0.2	0.5	0.2	—
Mumps	67	78	102	239	0.3	0.4	0.5	1.2
Pertussis	5,405	5,101	8,731	11,195	27.5	25.7	43.4	55.1
Pneumococcal disease (invasive)	2,413	2,236	2,369	1,685	12.3	11.2	11.8	8.3
Poliomyelitis	—	—	—	—	—	—	—	—
Rubella	254	55	32	31	1.3	0.3	0.2	0.2
Rubella—congenital	1	3	1	1	—	—	—	—
Tetanus	4	4	5	2	—	—	—	—
Vectorborne diseases								
Barmah Forest virus infection	869	1,369	1,105	1,320	4.4	6.9	5.5	6.5
Dengue	165	861	351	217	0.8	4.3	1.7	1.1
Flavivirus infection (nec)	72	60	61	29	0.4	0.3	0.3	0.1
Japanese encephalitis virus	—	1	1	—	—	—	—	—
Kunjin virus[(e)]	—	19	12	3	—	0.1	0.1	—
Malaria	462	595	558	817	2.4	3.0	2.8	4.0
Murray Valley encephalitis virus	2	—	1	2	—	—	—	—
Ross River virus infection	1,453	3,849	4,210	2,497	7.4	19.4	20.9	12.3
Zoonoses								
Anthrax	—	—	—	—	—	—	—	—
Australian bat lyssavirus	—	—	—	—	—	—	—	—
Brucellosis	39	20	39	41	0.2	0.1	0.2	0.2
Leptospirosis	159	131	177	129	0.8	0.7	0.9	0.6
Lyssavirus (nec)	—	—	—	—	—	—	—	—
Ornithosis	199	199	236	159	1.0	1.0	1.2	0.8
Q fever	757	561	463	350	3.9	2.8	2.3	1.7

(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* (SLTEC/VTEC).

(e) Reported as Murray Valley encephalitis in the Australian Capital Territory.

Source: NNDSS 2006.

Table S20: Characteristics of AIDS cases, by year of diagnosis[(a)]

Characteristic	≤1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Total cases	**6,832**	**670**	**391**	**325**	**206**	**261**	**208**	**225**	**222**	**160**
Per cent males	95.8	95.1	91.6	92.6	88.8	90.8	88.5	92.0	94.1	88.8
Median age (years)										
Males	37	37	37	39	39	39	40	40	41	42
Females	33	35	34	32	36	34	33	37	35	38
State/territory (per cent)										
NSW	58.9	54.9	52.2	53.2	57.3	49.0	45.2	43.1	57.7	47.5
Vic	20.6	20.7	21.0	20.9	18.4	24.1	25.5	20.4	20.7	23.1
Qld	9.7	11.5	15.6	11.7	16.0	16.1	13.9	21.8	10.4	17.5
WA	4.5	5.7	3.8	4.9	2.4	5.7	9.6	5.8	5.8	4.4
SA	4.2	4.8	6.1	5.9	4.9	3.1	4.8	6.7	1.8	5.6
Tas	0.5	1.0	0.5	0.9	0.0	0.4	0.5	0.9	0.0	0.6
ACT	1.2	1.1	0.0	1.5	0.0	1.1	0.0	0.9	1.8	0.0
NT	0.4	0.1	0.8	0.9	1.0	0.4	0.5	0.4	1.8	1.2
HIV exposure category (per cent)[(b)]										
Male homosexual contact	84.5	80.4	75.9	68.1	64.7	69.4	68.4	70.7	67.5	64.4
Male homosexual contact and injecting drug use	4.5	6.0	3.5	3.3	6.4	5.3	4.1	6.5	7.6	8.7
Injecting drug use[(c)]	2.6	3.4	4.9	7.9	5.9	6.1	4.1	3.7	6.2	6.0
Heterosexual contact	4.3	8.2	13.8	18.4	21.9	17.1	20.4	17.7	18.2	20.1
Haemophilia/coagulation disorder	1.6	1.1	1.1	0.3	0.5	1.2	1.0	0.9	0.5	0.0
Receipt of blood/tissue	2.1	0.9	0.3	1.3	0.5	0.4	0.5	0.5	0.0	0.7
Mother with/at risk for HIV infection	0.3	0.0	0.5	0.6	0.0	0.4	1.5	0.0	0.0	0.0
Other/undetermined	2.9	4.8	5.4	6.5	8.7	6.1	5.3	4.4	5.9	6.9
AIDS defining condition (per cent)										
Pneumocystis carinii pneumonia (PCP)	28.6	22.7	25.1	22.2	19.4	27.6	27.9	30.2	24.3	28.7
Kaposi's sarcoma (KS)	12.3	11.6	8.9	9.5	8.3	8.4	10.1	5.3	9.0	5.6
PCP and other (not KS)	5.5	4.3	6.9	6.8	8.3	6.9	8.2	8.0	7.6	6.3
Oesophageal candidiasis	9.5	14.6	10.2	10.5	12.6	11.5	6.7	12.0	8.6	7.5
Mycobacterium avium	4.8	6.6	3.8	4.3	2.9	5.0	3.8	1.8	2.7	1.9
HIV wasting disease	4.8	5.1	6.9	10.2	13.1	6.1	3.8	4.9	7.7	3.1
Other conditions	34.4	35.1	38.1	36.6	35.4	34.5	39.4	37.8	40.1	46.9

(a) Not adjusted for reporting delay.

(b) The 'Other/undetermined' category was excluded from the percentage of cases attributed to each HIV exposure category.

(c) Excludes males who also reported a history of homosexual contact.

Source: NCHECR 2005.

Cancer

Table S21: Most frequently occurring cancers[a], 2001

Cancer	New cases: Number	New cases: Per cent	New cases: ASR[b]	New cases: Lifetime risk[c]	Deaths: Number	Deaths: Per cent	Deaths: ASR[b]	Deaths: PYLL[d]
Males								
Prostate	11,191	23.4	128.5	1 in 11	2,718	13.3	35.2	5,665
Colorectal	6,961	14.6	79.0	1 in 17	2,601	12.7	30.5	17,183
Lung	5,384	11.3	61.4	1 in 22	4,657	22.8	53.7	28,948
Melanoma	5,024	10.5	55.2	1 in 25	684	3.4	7.8	7,568
Bladder	2,258	4.7	26.6	1 in 60	633	3.1	8.0	2,155
NHL[e]	1,923	4.0	21.4	1 in 64	787	3.9	9.2	6,628
Unknown site	1,736	3.6	20.5	1 in 80	1,213	5.9	14.7	7,173
Kidney	1,514	3.2	16.9	1 in 78	540	2.6	6.3	4,425
Stomach	1,202	2.5	13.8	1 in 104	753	3.7	8.9	5,140
Pancreas	958	2.0	11.0	1 in 133	946	4.6	11.0	6,465
All cancers	**47,820**	**100.0**	**541.4**	**1 in 3**	**20,417**	**100.0**	**241.2**	**139,913**
Females								
Breast	11,791	29.1	117.2	1 in 11	2,594	16.3	24.8	28,540
Colorectal	5,883	14.5	55.4	1 in 26	2,153	13.5	19.7	12,585
Melanoma	3,861	9.5	38.3	1 in 34	390	2.5	3.7	4,300
Lung	2,891	7.1	27.7	1 in 46	2,382	15.0	22.6	16,030
NHL[e]	1,576	3.9	15.1	1 in 88	715	4.5	6.5	3,935
Unknown site	1,568	3.9	14.3	1 in 117	1,217	7.7	10.9	5,640
Uterus	1,537	3.8	15.1	1 in 77	299	1.9	2.8	2,225
Ovary	1,295	3.2	12.6	1 in 104	857	5.4	8.1	6,598
Kidney	944	2.3	9.1	1 in 142	386	2.4	3.6	1,923
Pancreas	900	2.2	8.2	1 in 207	865	5.4	7.8	3,908
All cancers	**40,578**	**100.0**	**393.3**	**1 in 4**	**15,902**	**100.0**	**147.8**	**117,545**

(a) Non-melanocytic skin cancers, known to be the most common cancer type, are excluded from this list as basal cell carcinoma and squamous cell carcinoma, the two most common types of non-melanocytic skin cancer, are not notifiable cancers.

(b) Age-standardised rate per 100,000 population. Age-standardised to the Australian population as at 30 June 2001.

(c) Lifetime risk—a measure which approximates the risk of contracting a particular cancer in a lifetime if the risks at the year of estimation remained throughout a person's life. For the purposes of this table, 'lifetime' is defined as ages 0–74 years.

(d) Potential years of life lost between the ages of 0 and 74 years.

(e) Non-Hodgkin's lymphoma.

Sources: AIHW & AACR 2004; AIHW National Mortality Database.

Table S22: Major cancers, age-standardised incidence rates[a], 1993 to 2001 (per 100,000 population)

Cancer	1993	1994	1995	1996	1997	1998	1999	2000	2001
Males									
Prostate	164.4	183.7	167.8	136.4	128.5	126.5	126.7	124.9	128.5
Colorectal	75.7	77.0	78.2	79.5	78.2	76.0	76.2	80.2	79.0
Lung	71.3	74.1	69.8	69.6	69.0	67.1	65.0	62.1	61.4
Melanoma	48.2	48.4	51.2	53.2	55.3	51.6	53.4	53.7	55.2
Bladder	26.0	28.2	27.8	25.8	26.1	26.5	25.8	26.1	26.6
NHL[b]	20.8	19.6	19.4	21.5	21.2	20.7	21.2	21.5	21.4
Kidney[c]	14.7	14.9	15.8	15.6	15.3	16.3	17.3	16.8	16.9
Stomach	17.9	17.3	17.7	15.7	15.6	15.6	16.0	15.1	13.8
Pancreas	11.1	11.9	11.0	11.1	10.9	11.2	11.4	10.9	11.0
Brain & CNS[d]	7.5	8.1	8.4	8.3	8.1	7.7	8.1	8.6	8.9
All cancers	**580.3**	**608.3**	**587.3**	**561.2**	**551.0**	**541.9**	**539.7**	**535.7**	**541.4**
Females									
Breast	105.3	113.9	115.7	109.2	111.2	114.8	110.7	115.3	117.2
Colorectal	53.1	54.6	53.6	53.3	53.6	53.1	55.1	53.8	55.4
Melanoma	35.0	35.3	36.7	37.8	39.9	36.7	37.4	38.0	38.3
Lung	25.5	25.6	25.9	26.3	26.7	26.1	26.0	27.4	27.7
NHL[b]	13.7	14.4	15.1	15.1	15.5	15.1	15.1	15.6	15.1
Uterus[e]	14.7	15.6	15.4	14.6	14.9	14.8	14.7	15.8	15.1
Ovary[f]	11.2	10.8	11.6	11.4	11.0	11.5	11.2	12.6	12.6
Kidney[c]	8.3	8.2	8.4	8.7	8.8	8.9	9.3	9.2	9.1
Thyroid	5.5	5.5	6.5	6.9	6.4	7.3	7.4	8.0	8.9
Pancreas	8.6	8.2	8.6	8.6	8.8	9.1	8.6	8.4	8.2
All cancers	**374.9**	**387.2**	**393.3**	**385.0**	**388.8**	**390.5**	**385.8**	**390.4**	**393.3**

(a) Age-standardised to the Australian population at 30 June 2001.

(b) Non-Hodgkin's lymphoma.

(c) Includes ICD-10 codes C64–C66, C68.

(d) Brain and central nervous system includes ICD-10 codes C70–C72.

(e) Includes ICD-10 codes C54–C55.

(f) Includes ICD-10 codes C56–C57.

Source: AIHW & AACR 2004.

Oral health

Table S23: Primary teeth with caries experience[(a)], children aged 5–10 years, 1991 to 2001 (mean number of teeth)

	Age (years)					
	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

(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 S24: Permanent teeth with caries experience[(a)], children aged 7–14 years, 1991 to 2001 (mean number of teeth)

	Age (years)							
	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

(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 S25: Dental caries experience[a] of 6 year old and 12 year old children, states and territories, 1991 to 2001 (mean number of teeth)

	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
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

(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.

Source: AIHW Dental Statistics and Research Unit.

Use of hospitals

Table S26: Separations from public hospitals, by age group and sex, states and territories, 2003–04

Age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Males									
Under 1	24,218	18,891	11,227	4,800	5,683	877	1,012	1,473	68,181
1–4	29,139	18,909	16,502	7,526	7,529	1,126	1,171	1,611	83,513
5–14	36,685	23,360	20,921	9,934	8,155	1,554	1,309	1,447	103,365
15–24	39,328	30,822	24,960	11,390	10,970	2,400	2,081	1,932	123,883
25–34	48,743	43,021	29,503	15,326	14,292	3,509	2,828	3,348	160,570
35–44	58,321	53,879	36,215	19,215	18,237	3,271	3,958	4,702	197,798
45–54	68,824	68,948	44,487	22,246	22,923	4,857	4,418	6,814	243,517
55–64	86,171	88,429	54,012	26,002	26,779	6,318	6,804	5,566	300,081
65–74	109,856	114,450	57,542	28,872	30,913	7,703	6,182	2,723	358,241
75 and over	128,022	111,094	51,976	31,506	36,856	7,449	5,295	1,125	373,323
Total	*629,307*	*571,803*	*347,345*	*176,817*	*182,338*	*39,064*	*35,058*	*30,741*	*2,012,473*
Females									
Under 1	17,950	14,462	8,572	3,343	4,056	645	735	1,152	50,915
1–4	21,050	13,525	11,688	5,365	5,351	815	749	1,190	59,733
5–14	24,789	17,472	14,436	6,990	6,569	1,192	919	1,041	73,408
15–24	63,542	51,559	43,957	18,182	20,114	3,976	3,023	4,504	208,857
25–34	109,485	97,419	60,874	28,298	30,375	5,982	4,833	5,730	342,996
35–44	74,385	71,808	42,454	22,597	23,354	4,733	3,594	6,008	248,933
45–54	62,511	68,657	40,769	24,111	20,382	5,121	4,255	9,333	235,139
55–64	74,098	74,117	45,637	21,534	21,047	6,120	4,640	5,357	252,550
65–74	95,419	86,116	46,693	24,858	26,264	5,673	6,175	3,670	294,868
75 and over	152,965	120,588	58,588	35,151	39,270	7,600	5,048	1,398	420,608
Total	*696,194*	*615,723*	*373,668*	*190,429*	*196,782*	*41,857*	*33,971*	*39,383*	*2,188,007*
Total separations	**1,325,535**	**1,187,529**	**721,013**	**367,246**	**379,120**	**80,921**	**69,029**	**70,124**	**4,200,517**

Note: Totals include separations for which age and/or sex was not reported.

Source: AIHW National Hospital Morbidity Database.

Table S27: Separations from private hospitals, by age group and sex, states and territories, 2003–04

Age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Males									
Under 1	3,326	4,027	2,769	3,053	842	n.p.	n.p.	n.p.	14,546
1–4	5,371	3,186	4,582	3,007	1,539	n.p.	n.p.	n.p.	18,469
5–14	8,263	5,625	6,349	3,912	1,957	n.p.	n.p.	n.p.	27,490
15–24	16,828	15,435	12,574	8,192	5,427	n.p.	n.p.	n.p.	61,253
25–34	19,809	18,733	13,993	8,933	5,311	n.p.	n.p.	n.p.	70,142
35–44	31,600	30,067	24,846	13,793	8,730	n.p.	n.p.	n.p.	114,299
45–54	47,310	42,952	40,585	19,213	15,073	n.p.	n.p.	n.p.	172,517
55–64	64,618	53,620	61,317	24,893	17,383	n.p.	n.p.	n.p.	231,790
65–74	58,782	52,336	53,600	22,345	16,895	n.p.	n.p.	n.p.	212,264
75 and over	67,945	67,564	71,295	23,866	19,407	n.p.	n.p.	n.p.	259,449
Total	*323,852*	*293,545*	*291,910*	*131,207*	*92,564*	*n.p.*	*n.p.*	*n.p.*	*1,182,219*
Females									
Under 1	1,906	2,783	1,886	2,080	271	n.p.	n.p.	n.p.	9,258
1–4	3,388	2,036	3,163	1,982	1,055	n.p.	n.p.	n.p.	12,058
5–14	6,914	5,083	5,342	3,184	1,724	n.p.	n.p.	n.p.	23,379
15–24	24,694	26,851	22,316	12,644	6,050	n.p.	n.p.	n.p.	97,019
25–34	52,870	53,729	45,193	22,417	11,529	n.p.	n.p.	n.p.	194,978
35–44	55,094	58,827	46,520	23,347	13,643	n.p.	n.p.	n.p.	207,170
45–54	56,897	60,251	53,707	26,128	18,206	n.p.	n.p.	n.p.	225,615
55–64	60,826	58,054	54,961	24,661	20,103	n.p.	n.p.	n.p.	228,225
65–74	53,916	50,397	48,904	20,417	16,733	n.p.	n.p.	n.p.	197,423
75 and over	71,787	69,224	66,145	22,126	24,342	n.p.	n.p.	n.p.	263,323
Total	*388,293*	*387,235*	*348,137*	*158,986*	*113,656*	*n.p.*	*n.p.*	*n.p.*	*1,458,449*
Total separations	**712,145**	**680,806**	**640,047**	**290,193**	**206,221**	**n.p.**	**n.p.**	**n.p.**	**2,640,708**

Note: Totals include separations for which age and/or sex was not reported.

Source: AIHW National Hospital Morbidity Database.

Table S28: Separation statistics[(a)], by principal diagnosis, grouped into ICD-10-AM chapters, public hospitals, 2003–04

Principal diagnosis		Separations	Per cent same-day separations	Patient days	ALOS (days)	ALOS (days) excluding same-day
A00–B99	Infectious and parasitic diseases	79,004	24.4	307,150	3.9	4.8
C00–D48	Neoplasms	250,282	48.4	1,211,259	4.8	8.4
D50–D89	Blood, blood-forming diseases	57,038	64.8	141,760	2.5	5.2
E00–E90	Endocrine, nutritional, metabolic	76,504	38.6	387,632	5.1	7.6
F00–F99	Mental and behavious disorders	167,900	25.0	1,883,549	11.2	14.6
G00–G99	Nervous system diseases	90,651	40.3	409,230	4.5	6.9
H00–H59	Eye and adnexa diseases	60,676	82.4	79,682	1.3	2.8
H60–H95	Ear and mastoid process diseases	29,287	60.2	45,794	1.6	2.4
I00–I99	Circulatory diseases	296,013	21.0	1,592,527	5.4	6.5
J00–J99	Respiratory diseases	252,324	15.3	1,110,028	4.4	5.0
K00–K93	Digestive diseases	359,507	46.0	1,047,077	2.9	4.5
L00–L99	Skin and subcutaneous tissue diseases	78,101	38.4	333,065	4.3	6.3
M00–M99	Musculoskeletal diseases	146,503	42.7	586,317	4.0	6.2
N00–N99	Genitourinary diseases	197,507	48.2	534,005	2.7	4.3
O00–O99	Pregnancy, childbirth and the puerperium	309,123	25.1	859,380	2.8	3.4
P00–P96	Conditions originating in the perinatal period	41,221	13.1	379,341	9.2	10.4
Q00–Q99	Congenital malformations	22,987	48.8	85,953	3.7	6.4
R00–R99	Symptoms, signs	280,458	43.8	657,474	2.3	3.4
S00–T98	Injuries and poisoning	366,080	33.3	1,436,247	3.9	5.4
Z00–Z99	Factors influencing health status and contact with health services	1,037,328	87.8	3,282,658	3.2	18.8
	Not reported	2,023	33.0	48,413	23.9	35.2
Total		**4,200,517**	**49.0**	**16,418,541**	**3.9**	**6.7**

(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 S29: Separation statistics[(a)], by principal diagnosis, grouped into ICD-10-AM chapters, private hospitals, 2003–04

Principal diagnosis		Separations	Per cent same-day separations	Patient days	ALOS (days)	ALOS (days) excluding same-day
A00–B99	Infectious and parasitic diseases	13,888	30.0	63,487	4.6	6.1
C00–D48	Neoplasms	246,835	60.9	765,643	3.1	6.4
D50–D89	Blood, blood-forming diseases	23,133	68.7	50,068	2.2	4.7
E00–E90	Endocrine, nutritional, metabolic	34,647	45.2	125,939	3.6	5.8
F00–F99	Mental and behavious disorders	119,159	74.2	606,976	5.1	16.9
G00–G99	Nervous system diseases	64,905	33.9	146,079	2.3	2.9
H00–H59	Eye and adnexa diseases	128,268	89.1	132,735	1.0	1.3
H60–H95	Ear and mastoid process diseases	24,244	73.7	30,471	1.3	2.0
I00–I99	Circulatory diseases	152,846	31.1	649,261	4.2	5.7
J00–J99	Respiratory diseases	79,632	15.6	336,557	4.2	4.8
K00–K93	Digestive diseases	424,334	75.2	692,327	1.6	3.6
L00–L99	Skin and subcutaneous tissue diseases	41,607	66.2	125,012	3.0	6.9
M00–M99	Musculoskeletal diseases	220,423	41.8	723,966	3.3	4.9
N00–N99	Genitourinary diseases	154,159	55.4	333,779	2.2	3.6
O00–O99	Pregnancy, childbirth and the puerperium	140,614	37.5	465,936	3.3	4.7
P00–P96	Conditions originating in the perinatal period	10,425	4.4	77,448	7.4	7.7
Q00–Q99	Congenital malformations	10,095	56.1	20,446	2.0	3.3
R00–R99	Symptoms, signs	128,490	62.7	264,318	2.1	3.8
S00–T98	Injuries and poisoning	83,525	27.0	409,203	4.9	6.3
Z00–Z99	Factors influencing health status and contact with health services	537,799	89.0	1,136,506	2.1	11.1
	Not reported	2,074	60.6	8,999	4.3	9.5
Total		**2,641,102**	**62.6**	**7,165,156**	**2.7**	**5.6**

(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 S30: Separation statistics, by procedure in ICD-10-AM groupings, public hospitals, 2003–04

Procedure block		Separations	Per cent same-day separations	Patient days	ALOS (days)	ALOS (days) excluding same-day
1–86	Procedures on nervous system	66,114	40.8	438,749	6.6	10.5
110–129	Procedures on thyroid and parathyroid glands	5,657	3.5	26,457	4.7	4.8
160–256	Procedures on eye and adnexa	67,996	82.9	110,205	1.6	4.6
300–333	Procedures on ear and mastoid process	25,585	66.2	56,283	2.2	4.6
370–422	Procedures on nose, mouth and pharynx	47,210	30.3	102,500	2.2	2.7
450–490	Dental services	29,375	84.2	92,600	3.2	14.6
520–569	Procedures on respiratory system	76,392	21.8	996,192	13.0	16.4
600–767	Procedures on cardiovascular system	160,547	23.0	1,543,647	9.6	12.2
800–817	Procedures on blood and blood-forming organs	27,912	36.0	212,628	7.6	11.3
850–1011	Procedures on digestive system	377,722	52.8	1,566,448	4.1	7.7
1040–1129	Procedures on urinary system	737,511	91.6	1,257,825	1.7	9.4
1160–1203	Procedures on male genital organs	35,868	53.8	92,480	2.6	4.4
1240–1299	Gynaecological procedures	144,518	65.8	288,571	2.0	3.9
1330–1347	Obstetric procedures	162,194	5.1	605,692	3.7	3.9
1360–1579	Procedures on musculoskeletal system	209,042	29.6	1,155,614	5.5	7.4
1600–1718	Dermatological and plastic procedures	167,692	50.5	910,060	5.4	10.0
1740–1759	Procedures on breast	18,143	45.8	48,463	2.7	4.1
1780–1799	Chemotherapeutic & radiation oncology procs	150,810	82.7	388,542	2.6	10.1
1820–1916	Non-invasive, cognitive & other interventions (nec)	1,930,987	38.5	11,091,491	5.7	8.7
1940–2016	Imaging services	350,013	15.4	3,427,637	9.8	11.4
	No procedure or not reported	1,110,196	34.7	3,538,625	3.2	4.3
Total[(a)]		**4,200,517**	**49.0**	**16,418,541**	**3.9**	**6.7**

(a) 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; procs = procedures.

Source: AIHW National Hospital Morbidity Database.

Table S31: Separation statistics, by procedure in ICD-10-AM groupings, private hospitals, 2003–04

Procedure block		Separations	Per cent same-day separations	Patient days	ALOS (days)	ALOS (days) excluding same-day
1–86	Procedures on nervous system	72,546	52.9	257,327	3.5	6.4
110–129	Procedures on thyroid and parathyroid glands	5,607	1.5	18,179	3.2	3.3
160–256	Procedures on eye and adnexa	136,396	88.7	142,985	1.0	1.4
300–333	Procedures on ear and mastoid process	26,266	71.9	31,556	1.2	1.7
370–422	Procedures on nose, mouth and pharynx	58,837	34.5	75,604	1.3	1.4
450–490	Dental services	85,885	94.3	89,917	1.0	1.8
520–569	Procedures on respiratory system	25,721	26.6	202,746	7.9	10.4
600–767	Procedures on cardiovascular system	115,815	27.0	598,083	5.2	6.7
800–817	Procedures on blood and blood-forming organs	18,249	29.8	93,000	5.1	6.8
850–1011	Procedures on digestive system	565,810	77.1	1,080,489	1.9	5.0
1040–1129	Procedures on urinary system	234,529	80.9	441,648	1.9	5.6
1160–1203	Procedures on male genital organs	50,164	55.0	126,451	2.5	4.4
1240–1299	Gynaecological procedures	177,541	76.1	299,521	1.7	3.9
1330–1347	Obstetric procedures	74,200	2.2	372,297	5.0	5.1
1360–1579	Procedures on musculoskeletal system	242,297	41.4	834,152	3.4	5.2
1600–1718	Dermatological and plastic procedures	158,628	71.0	339,474	2.1	4.9
1740–1759	Procedures on breast	29,371	40.7	63,835	2.2	3.0
1780–1799	Chemotherapeutic & radiation oncology procedures	160,297	90.2	251,698	1.6	6.8
1820–1916	Non-invasive, cognitive & other interventions (nec)	1,898,145	61.0	5,552,777	2.9	5.9
1940–2016	Imaging services	108,484	21.1	906,542	8.4	10.3
	No procedure or not reported	219,432	32.5	792,535	3.6	4.9
Total[(a)]		**2,640,708**	**62.6**	**7,164,762**	**2.7**	**5.6**

(a) 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; procs = procedures.

Source: AIHW National Hospital Morbidity Database.

Table S32: Separations[(a)], same-day separations, patient-days, average length of stay and cost, by Major Diagnostic Category (based on AR-DRGs version 5.0), public hospitals, 2003–04

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	195,180	35.5	1,052,596	5.4	7.8	864,068
02	Eye diseases and disorders	78,259	80.4	106,668	1.4	2.9	174,243
03	Ear, nose, mouth and throat	163,367	48.6	266,809	1.6	2.2	339,421
04	Respiratory system	238,767	15.5	1,168,094	4.9	5.6	961,044
05	Circulatory system	346,326	25.6	1,345,276	3.9	4.9	1,498,331
06	Digestive system	421,909	47.3	1,129,452	2.7	4.2	1,136,187
07	Hepatobiliary system and pancreas	75,640	20.2	319,701	4.2	5.0	353,412
08	Musculoskeletal system and connective tissue	312,668	37.4	1,290,064	4.1	6.0	1,482,941
09	Skin, subcutaneous tissue and breast	158,976	52.8	463,790	2.9	5.1	418,719
10	Endocrine, nutritional and metabolic	58,378	28.3	287,491	4.9	6.5	258,628
11	Kidney and urinary tract	755,917	89.9	1,061,067	1.4	5.0	702,961
12	Male reproductive system	42,530	54.8	98,784	2.3	3.9	117,787
13	Female reproductive system	119,306	63.0	227,855	1.9	3.5	325,527
14	Pregnancy, childbirth and puerperium	322,467	26.0	887,674	2.8	3.4	986,575
15	Newborns and other neonates	56,685	12.1	444,136	7.8	8.8	397,565
16	Blood-forming organs, immunological disorders	65,508	66.7	152,499	2.3	5.0	134,423
17	Neoplastic disorders	178,378	89.2	312,607	1.8	8.0	300,769
18	Infectious and parasitic diseases	53,192	19.7	265,970	12.2	6.0	242,330
19	Mental diseases and disorders	128,234	28.2	1,256,686	9.8	13.3	646,570
20	Alcohol/drug use and disorders	29,226	23.3	119,763	4.1	5.0	65,903
21	Injuries, poisoning and toxic effects of drugs	120,913	39.4	334,025	19.8	3.9	363,445
22	Burns	6,328	32.4	34,207	5.4	7.5	49,501
23	Factors influencing health status, other contacts	116,230	72.0	296,889	2.6	6.6	183,140
ED	Error DRG[(d)]	7,032	25.9	77,925	11.1	14.6	66,560
PR	Pre-MDC[(d)]	11,204	3.1	316,366	28.2	29.1	681,515
Total		**4,062,620**	**50.0**	**13,316,394**	**3.3**	**5.6**	**12,751,563**

(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) 'Pre-MDC' is a group of particularly resource-intensive AR-DRGs such as transplants. Separations in the 'Error DRG' grouping did not have a valid AR-DRG.
Note: Abbreviations: ALOS = average length of stay; MDC = Major Diagnostic Category; AR-DRG = Australian Refined Diagnosis Related Group.
Source: AIHW National Hospital Morbidity Database.

Table S33: Separations[a], same-day separations, patient days, average length of stay and cost, by Major Diagnostic Category (based on AR-DRGs version 5.0), private hospitals, 2003–04

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	60,243	43.8	296,736	4.9	8.0	193,936
02	Eye diseases and disorders	144,985	88.7	151,909	1.0	1.4	178,816
03	Ear, nose, mouth and throat	176,538	68.6	213,542	1.2	1.7	219,115
04	Respiratory system	76,881	8.1	378,949	4.9	5.3	205,419
05	Circulatory system	146,839	24.0	585,373	4.0	4.9	890,192
06	Digestive system	448,458	76.0	809,877	1.8	4.4	544,080
07	Hepatobiliary system and pancreas	32,634	10.1	117,190	3.6	3.9	111,010
08	Musculoskeletal system and connective tissue	277,761	40.0	1,001,826	3.6	5.3	1,156,152
09	Skin, subcutaneous tissue and breast	155,223	69.0	314,390	2.0	4.3	268,655
10	Endocrine, nutritional and metabolic	24,706	26.7	106,474	4.3	5.5	89,722
11	Kidney and urinary tract	206,881	83.5	319,262	1.5	4.3	174,278
12	Male reproductive system	50,133	58.0	117,705	2.3	4.2	90,979
13	Female reproductive system	131,601	68.5	242,708	1.8	3.7	212,142
14	Pregnancy, childbirth and puerperium	143,543	37.3	476,823	3.3	4.7	342,061
15	Newborns and other neonates	14,433	13.5	89,064	6.2	7.0	43,101
16	Blood-forming organs, immunological disorders	25,744	70.3	53,963	2.1	4.7	31,372
17	Neoplastic disorders	172,338	93.3	232,596	1.3	6.2	120,203
18	Infectious and parasitic diseases	11,809	13.9	76,368	6.5	7.3	43,316
19	Mental diseases and disorders	90,627	75.2	425,759	4.7	15.9	131,782
20	Alcohol/drug use and disorders	14,062	71.2	64,451	4.6	13.4	18,146
21	Injuries, poisoning and toxic effects of drugs	18,494	32.3	67,453	3.6	4.9	51,050
22	Burns	328	22.3	1,468	4.5	5.5	892
23	Factors influencing health status, other contacts	119,751	88.1	199,104	1.7	6.6	103,451
ED	Error DRG[d]	6,806	51.5	38,171	5.6	10.5	12
PR	Pre-MDC[d]	1,496	1.9	44,986	30.1	30.6	3,907
Total		**2,552,314**	**63.0**	**6,426,147**	**2.5**	**5.1**	**5,223,788**

(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 4.2) in private hospitals in 2002–03.
(d) 'Pre-MDC' is a group of particularly resource-intensive AR-DRGs such as transplants. Separations in the 'Error DRG' grouping did not have a valid AR-DRG.

Note: ALOS = average length of stay; MDC = Major Diagnostic Category; AR-DRG = Australian Refined Diagnosis Related Group.

Source: AIHW National Hospital Morbidity Database.

Table S34: Top 15 generic medications used in the community[(a)], by defined daily dose and volume, 2000–01 and 2004–05

	2000–01				2004–05				% difference 2000–01 to 2004–05			
	DDD		Volume ('000)		DDD		Volume ('000)		DDD		Volume	
Generic name	PBS/ RPBS	Total	PBS/ RPBS	Total	PBS/ RPBS	Total	PBS/ RPBS	Total	PBS/ RPBS	Total	PBS/ RPBS	Total
Atorvastatin	44.4	44.4	4,747	4,752	98.2	98.4	8,075	8,095	121.2	121.6	70.1	70.3
Simvastatin	32.4	32.5	4,787	4,792	56.0	56.1	6,276	6,287	72.8	72.5	31.1	31.2
Ramipril	12.8	12.9	1,561	1,593	33.7	36.8	2,904	3,320	163.6	185.2	86.0	108.4
Diltiazem hydrochloride	57.8	57.9	1,487	1,488	30.1	32.8	1,376	1,493	–47.9	–43.4	–7.4	0.3
Omeprazole	15.3	15.4	2,762	2,782	20.6	20.7	4,413	4,425	34.9	34.3	59.8	59.1
Irbesartan	14.6	14.6	2,458	2,460	20.2	21.5	3,371	3,717	38.2	47.1	37.1	51.1
Salbutamol	22.2	30.2	3,589	4,736	18.8	26.7	3,063	4,241	–15.1	–11.5	–14.7	–10.5
Frusemide	20.0	21.6	1,367	1,482	18.8	20.0	1,397	1,488	–6.1	–7.6	2.2	0.4
Aspirin	12.9	14.0	1,257	1,378	18.2	19.4	1,499	1,625	40.8	38.4	19.3	17.9
Sertraline	14.3	14.4	2,257	2,267	17.6	17.7	2,585	2,596	23.1	22.9	14.5	14.5
Amlodipine besylate	15.1	15.9	2,337	2,504	15.5	16.6	2,396	2,649	2.4	4.2	2.5	5.8
Pravastatin[(b)]	8.8	8.8	1,504	1,504	14.0	14.0	2,102	2,106	59.6	59.7	39.8	40.0
Celecoxib	29.0	29.4	3,852	3,966	12.4	12.5	2,864	2,889	–57.2	–57.5	–25.7	–27.1
Perindopril[(b)]	9.0	9.2	2,358	2,358	12.3	13.8	2,837	3,298	37.0	50.2	20.3	39.8
Esomeprazole[(b)]	0.0	0.0	0.4	0.4	11.5	11.5	2,984	2,992	. .	. .	. .	. .

(a) Medications included here are those for which a prescription is written and supplied in community pharmacies. Hospital pharmaceuticals and over-the-counter medications, such as aspirin, supplied without prescription are not included.

(b) 2000–01 data derived from the average of the calendar years 2000 and 2001.

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 (DoHA 2003).

Sources: DoHA Drug Utilisation Sub-Committee (DUSC) database; DoHA 2003, 2004.

Health expenditure

Table S35: Australian government receipts from the Medicare levy and total taxation revenue, current prices, 1984–85 to 2003–04 ($ million)

Revenue type	1984–85	1990–91	1992–93	1994–95	1996–97	1998–99	2000–01	2002–03	2003–04
Medicare levy	1,223	2,480	2,415	3,030	3,664	4,100	4,605	5,000	5,560
Total taxation revenue	52,970	92,739	88,760	104,921	124,559	141,105	146,056	160,661	172,243
Medicare levy as a proportion of total taxation revenue	2.3%	2.7%	2.7%	2.9%	2.9%	2.9%	3.2%	3.1%	3.2%

Source: Commonwealth of Australia Budget Papers, various years.

Table S36: Health-related taxation expenditures, current and constant[(a)] prices, 1993–94 to 2003–04 ($ million)

Year	Current prices	Constant prices
1993–94	95	120
1994–95	91	114
1995–96	113	136
1996–97	128	153
1997–98	145	170
1998–99	162	184
1999–00	173	192
2000–01	203	217
2001–02	225	233
2002–03	256	256
2003–04	291	280

(a) See Box 6.2 for explanation of constant price estimating method.

Source: AIHW Health Expenditure Database.

Table S37: Total health expenditure (current prices), by source of funds[(a)], 2002–03 ($ million)

	Government sector			Non-government sector				
Health service type	Australian Government	State and local	Total	Health insurance funds	Individuals	Other[(b)]	Total	Total all sectors
Total hospitals	10,637	9,144	19,781	2,820	598	1,314	4,732	24,513
Public (non-psychiatric) hospitals	8,696	8,388	17,084	285	316	750	1,351	18,435
Public psychiatric hospitals	—	466	466	—	15	4	20	485
Private hospitals	1,941	290	2,231	2,535	266	560	3,362	5,593
High-level residential care	3,435	207	3,642	—	903	—	903	4,545
Ambulance and other (nec)	128	405	533	92	393	82	568	1,101
Total institutional	*14,201*	*9,756*	*23,957*	*2,913*	*1,893*	*1,397*	*6,203*	*30,159*
Medical services	9,395	—	9,395	486	1,423	675	2,585	11,980
Other professional services	621	—	621	327	1,576	294	2,197	2,818
Pharmaceuticals	5,226	—	5,226	52	4,638	96	4,786	10,011
Benefit-paid pharmaceuticals	5,166	—	5,166	—	951	—	951	6,116
All other items	60	—	60	52	3,687	96	3,835	3,895
Aids and appliances	225	—	225	237	1,987	51	2,276	2,501
Other non-institutional services	2,453	4,283	6,736	1,253	2,969	27	4,249	10,985
Community health and other[(c)]	253	3,082	3,335	—	—	15	16	3,351
Public health	715	486	1,200	—	—	—	—	1,200
Dental services	375	327	702	679	2,969	11	3,660	4,362
Health administration	1,110	389	1,499	573	—	—	573	2,073
Research	923	151	1,073	—	—	302	302	1,375
Total non-institutional	*18,843*	*4,434*	*23,277*	*2,355*	*12,593*	*1,446*	*16,394*	*39,671*
Total recurrent expenditure	**33,043**	**14,190**	**47,233**	**5,268**	**14,486**	**2,843**	**22,597**	**69,830**
Capital outlays	139	1,135	1,274	n.a.	n.a.	n.a.	[(d)]292	1,566
Capital consumption	29	1,027	1,056	. .	. .	. .	[(e)]. .	1,056
Total health expenditure[(f)]	**33,211**	**16,352**	**49,563**	**n.a.**	**n.a.**	**n.a.**	**22,889**	**72,452**

(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 services. It does not show gross outlays on health services by the different service provider sectors.
(b) 'Other' includes expenditure on health 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) Includes expenditure that was previously classified as 'other non-institutional (nec)' as well as expenditure on community health services.
(d) Capital outlays for the non-government sector cannot be allocated according to source of funds.
(e) Non-government capital consumption (depreciation) is included as part of recurrent expenditure.
(f) Not adjusted for tax expenditure.

Note: Some components may not add to totals due to rounding.

Source: AIHW Health Expenditure Database.

Table S38: Preliminary estimate of total health expenditure (current prices), by source of funds[(a)], 2003–04 ($ million)

	Government sector			Non-government sector				
Health service type	**Australian Government**	**State and local**	**Total**	**Health insurance funds**	**Individuals**	**Other[(b)]**	**Total**	**Total all sectors**
Total hospitals	11,302	9,986	21,288	3,036	649	1,440	5,126	26,413
Public (non-psychiatric) hospitals	9,191	9,152	18,343	316	341	821	1,477	19,820
Public psychiatric hospitals	—	512	513	—	17	5	21	534
Private hospitals	2,111	321	2,432	2,721	292	615	3,627	6,059
High-level residential care	3,729	225	3,955	—	1,030	—	1,030	4,985
Ambulance and other (nec)	146	423	569	89	417	88	594	1,163
Total institutional	*15,178*	*10,634*	*25,811*	*3,126*	*2,096*	*1,528*	*6,750*	*32,561*
Medical services	9,950	—	9,950	543	1,598	869	3,010	12,961
Other professional services	669	—	669	343	1,989	376	2,709	3,378
Pharmaceuticals	5,690	—	5,690	49	5,091	104	5,244	10,935
Benefit-paid pharmaceuticals	5,628	—	5,628	—	1,037	—	1,037	6,665
All other items	62	—	62	49	4,055	104	4,208	4,270
Aids and appliances	246	—	246	253	2,187	56	2,496	2,742
Other non-institutional services	2,522	4,633	7,155	1,289	3,251	29	4,569	11,724
Community health and other[(c)]	274	3,301	3,575	1	—	17	17	3,593
Public health	664	599	1,263	—	—	—	—	1,263
Dental services	397	326	723	708	3,251	12	3,971	4,694
Health administration	1,187	407	1,594	581	—	—	581	2,174
Research	1,001	159	1,160	—	—	344	344	1,504
Total non-institutional	*20,078*	*4,792*	*24,870*	*2,477*	*14,117*	*1,778*	*18,373*	*43,243*
Total recurrent expenditure	**35,256**	**15,426**	**50,682**	**5,603**	**16,213**	**3,306**	**25,123**	**75,804**
Capital outlays	151	1,215	1,366	n.a.	n.a.	n.a.	[(d)]307	1,673
Capital consumption	31	1,090	1,121	. .	. .	. .	[(e)]. .	1,121
Total health expenditure[(f)]	**35,437**	**17,731**	**53,168**	**n.a.**	**n.a.**	**n.a.**	**25,430**	**78,598**

(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 services. It does not show gross outlays on health services by the different service provider sectors.
(b) 'Other' includes expenditure on health 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) Includes expenditure that was previously classified as 'other non-institutional (nec)' as well as expenditure on community health services.
(d) Capital outlays for the non-government sector cannot be allocated according to source of funds.
(e) Non-government capital consumption (depreciation) is included as part of recurrent expenditure.
(f) Not adjusted for tax expenditure.
Note: Some components may not add to totals due to rounding.
Source: AIHW Health Expenditure Database.

Table S39: Annual growth in recurrent health expenditure (constant prices)[a], 1993–94 to 2003–04 (per cent)

Health service type	1993–94 to 1994–95	1994–95 to 1995–96	1995–96 to 1996–97	1996–97 to 1997–98	1997–98 to 1998–99	1998–99 to 1999–00	1999–00 to 2000–01	2000–01 to 2001–02	2001–02 to 2002–03	2002–03 to 2003–04	1993–94 to 2003–04	1993–94 to 1997–98	1997–98 to 2002–03
Hospitals	4.7	3.9	4.2	3.2	4.2	1.6	2.6	4.3	5.2	3.1	3.7	4.0	3.6
Public (non-psychiatric) hospitals	3.3	4.9	6.5	6.1	3.8	1.7	3.2	4.6	6.8	3.7	4.5	5.2	4.0
Public psychiatric hospitals	–4.2	–7.3	–11.1	–9.2	2.0	3.8	–10.4	17.3	–0.5	6.1	–1.7	–8.0	2.0
Private hospitals	9.6	2.6	–0.2	–3.8	5.8	1.2	1.9	2.4	1.0	0.8	2.1	1.9	2.4
High-level residential care	1.1	5.6	6.0	7.7	3.1	–1.5	0.9	3.0	6.2	5.8	3.8	5.1	2.3
Ambulance and other (nec)	–5.0	10.8	–23.5	24.1	15.7	–5.1	11.2	14.6	5.7	2.0	4.2	0.0	8.1
Total institutional	*3.8*	*4.4*	*3.6*	*4.4*	*4.4*	*0.9*	*2.6*	*4.5*	*5.4*	*3.5*	*3.7*	*4.0*	*3.5*
Medical services	5.4	4.7	2.4	0.9	3.3	5.9	0.7	3.9	1.6	5.1	3.4	3.3	3.1
Other professional services	–3.9	–3.9	12.3	–11.6	–2.8	–2.4	31.9	5.3	3.0	7.8	3.0	–2.1	6.3
Pharmaceuticals	9.8	7.9	9.2	8.0	8.9	11.8	16.9	12.0	8.8	7.8	10.1	8.7	11.7
Benefit-paid items	11.2	17.2	8.8	3.0	9.4	13.0	20.9	8.3	10.8	8.9	11.0	9.9	12.4
All other items	8.0	–4.5	9.9	16.1	8.3	10.0	11.0	18.0	5.8	6.1	8.7	7.1	10.6
Aids and appliances	1.7	3.7	4.0	3.4	25.6	10.4	30.3	–0.9	7.1	6.1	8.7	3.2	13.9
Other non-institutional services	n.a.	4.7	6.0	2.2	–0.7	9.6	14.6	6.0	5.6	2.0	5.2	3.9	6.9
Community health and other[b]	n.a.	17.9	26.7	0.8	11.6	–3.1	27.7	5.7	10.8	3.2	5.2	–0.1	10.1
Public health	n.a.	4.7	–5.4	7.3	8.6	15.1	7.0	3.9	7.0	1.5	20.3	43.3	8.3
Dental services	1.6	4.1	3.2	–2.2	–1.9	4.4	13.4	14.4	–0.4	1.6	3.7	1.7	5.7
Health administration	18.5	–5.0	–4.0	11.5	–17.8	39.6	5.5	–8.1	10.4	0.9	4.1	4.8	4.2
Research	8.8	3.8	6.2	–6.2	7.8	18.0	23.4	6.4	7.7	5.2	7.9	3.0	12.5
Total non-institutional	*4.4*	*4.5*	*5.7*	*1.5*	*4.0*	*8.2*	*12.4*	*6.2*	*5.1*	*5.2*	*5.7*	*4.0*	*7.2*
Total recurrent expenditure	**4.1**	**4.4**	**4.7**	**2.9**	**4.2**	**4.7**	**7.9**	**5.5**	**5.2**	**4.4**	**4.8**	**4.0**	**5.5**

(a) See Box 6.2 for explanation of constant price estimating method.

(b) Includes expenditure that was previously classified as 'other non-institutional (nec)' as well as expenditure on community health services.

Note: Some components may not add to totals due to rounding.

Source: AIHW Health Expenditure Database.

Table S40: Total health expenditure, current and constant prices[(a)], and annual growth rates, 1993–94 to 2003–04

	Amount ($ million)		Growth rate (%)	
Year	Current	Constant	Current	Constant
1993–94	36,990	48,112	. .	. .
1994–95	39,216	49,973	6.0	3.9
1995–96	42,082	52,089	7.3	4.2
1996–97	45,296	54,752	7.6	5.1
1997–98	48,288	56,615	6.6	3.4
1998–99	51,440	58,918	6.5	4.1
1999–00	55,255	61,857	7.4	5.0
2000–01	61,635	66,542	11.5	7.6
2001–02	66,769	69,507	8.3	4.5
2002–03	72,452	72,452	8.5	4.2
2003–04[(b)]	78,598	75,695	8.5	4.5
Average annual growth rates				
1993–94 to 1997–98			6.9	4.2
1997–98 to 2002–03			8.5	5.1
1993–94 to 2003–04			7.8	4.6

(a) See Box 6.2 for explanation of constant price estimating method.

(b) Based on preliminary AIHW and ABS estimates.

Source: AIHW Health Expenditure Database.

Table S41: Expenditure on health for Aboriginal and Torres Strait Islander peoples, by program, 2001–02

Program responsibility	Total expenditure ($m)	Per person expenditure ($)	Per cent of total
Through state and local government programs	1,260.5	2,749	70.5
Through Australian government programs	418.1	912	23.4
Australian Government Health and Ageing portfolio programs	408.8	892	22.9
Medicare and PBS	118.4	258	6.6
Indigenous-specific programs	218.3	476	12.2
Other Health and Ageing portfolio programs	72.1	157	4.0
Department of Veterans' Affairs programs	9.3	20	0.5
RPBS	1.3	3	0.1
Other DVA programs	8.1	18	0.5
Through non-government programs	110.0	240	6.2
Total	**1,788.6**	**3,901**	**100.0**

Source: AIHW 2005.

Table S42: Recurrent expenditure on health (current prices), 1993–94 to 2003–04 (per cent)

Area of expenditure	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04
Hospitals	37.5	37.3	37.2	37.5	37.8	37.9	36.9	35.1	34.9	35.1	34.8
Public (non-psychiatric) hospitals	28.7	28.3	28.1	28.3	28.9	28.9	28.0	26.6	26.2	26.4	26.1
Public psychiatric hospitals	1.4	1.3	1.1	1.0	0.8	0.8	0.8	0.7	0.7	0.7	0.7
Private hospitals	7.4	7.8	8.0	8.2	8.1	8.2	8.1	7.8	8.0	8.0	8.0
High-level residential care	7.7	7.4	7.4	7.5	7.7	7.7	7.2	6.7	6.5	6.5	6.6
Ambulance and other (nec)	1.7	1.6	1.6	1.2	1.4	1.6	1.4	1.5	1.6	1.6	1.5
Total institutional	*46.9*	*46.3*	*46.3*	*46.1*	*47.0*	*47.1*	*45.5*	*43.3*	*43.0*	*43.2*	*43.0*
Medical services	19.9	20.0	19.8	19.2	18.9	18.7	18.7	17.6	17.6	17.2	17.1
Other professional services	3.6	3.6	3.4	3.7	3.3	3.1	2.9	3.7	3.8	4.0	4.5
Pharmaceuticals	11.0	11.5	11.7	12.0	12.3	12.6	13.2	14.0	14.4	14.3	14.4
Benefit-paid items	6.6	6.9	7.6	7.7	7.5	7.7	8.1	8.8	8.7	8.8	8.8
All other items	4.4	4.6	4.2	4.4	4.9	4.9	5.1	5.2	5.7	5.6	5.6
Aids and appliances	2.8	2.8	2.7	2.7	2.7	3.2	3.3	4.0	3.6	3.6	3.6
Other non-institutional services[(a)]	14.3	14.2	14.3	14.5	14.4	13.8	14.6	15.6	15.7	15.7	15.5
Community health and other[(b)]	4.7	3.0	3.4	4.1	3.9	4.2	3.9	4.6	4.6	4.8	4.7
Public health	0.4	1.7	1.7	1.5	1.5	1.6	1.8	1.7	1.7	1.7	1.7
Dental services	5.9	5.9	6.0	6.0	5.7	5.4	5.6	5.9	6.5	6.2	6.2
Health administration	3.2	3.6	3.3	3.0	3.2	2.5	3.4	3.3	2.9	3.0	2.9
Research[(c)]	1.5	1.6	1.6	1.6	1.4	1.5	1.7	1.9	1.9	2.0	2.0
Total non-institutional	*53.1*	*53.7*	*53.7*	*53.9*	*53.0*	*52.9*	*54.5*	*56.7*	*57.0*	*56.8*	*57.0*
Total recurrent expenditure	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

(a) 'Other non-institutional services' is a summary of community and public health, dental services and administration.

(b) Includes expenditure that was previously classified as 'other non-institutional (nec)' as well as expenditure on community health services.

(c) Health services research expenditure has been allocated according to the level of government or the private sector organisation that actually undertakes the research activity, not according to source of funds.

Source: AIHW Health Expenditure Database.

Table S43: Total recurrent expenditure on health, constant prices[a], 1993–94 to 2003–04 ($ million)

Area of expenditure	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04[b]
Hospitals	17,573	18,394	19,109	19,913	20,548	21,417	21,763	22,328	23,296	24,513	25,270
Public (non-psychiatric) hospitals	12,367	12,773	13,398	14,274	15,149	15,723	15,990	16,502	17,268	18,435	19,118
Public psychiatric hospitals	612	586	544	483	439	447	464	416	488	485	515
Private hospitals	4,594	5,035	5,167	5,156	4,961	5,247	5,308	5,410	5,540	5,593	5,636
High-level residential care	3,326	3,361	3,550	3,764	4,054	4,179	4,118	4,153	4,280	4,545	4,809
Ambulance and other (nec)	746	709	785	600	745	862	818	909	1,042	1,101	1,123
Total institutional	*21,645*	*22,463*	*23,444*	*24,277*	*25,348*	*26,459*	*26,699*	*27,390*	*28,618*	*30,159*	*31,201*
Medical services	9,025	9,512	9,956	10,198	10,294	10,635	11,264	11,347	11,788	11,980	12,591
Other professional services	2,266	2,178	2,093	2,351	2,079	2,019	1,971	2,600	2,737	2,818	3,038
Pharmaceuticals	4,128	4,532	4,891	5,342	5,769	6,284	7,024	8,214	9,200	10,011	10,792
Benefit-paid items	2,335	2,596	3,043	3,311	3,411	3,731	4,216	5,096	5,520	6,116	6,660
All other items	1,793	1,935	1,848	2,031	2,358	2,553	2,808	3,118	3,680	3,895	4,132
Aids and appliances	1,150	1,169	1,212	1,261	1,304	1,638	1,808	2,356	2,336	2,501	2,654
Other non-institutional services[c]	6,757	6,932	7,261	7,695	7,865	7,811	8,561	9,812	10,403	10,985	11,200
Community health and other[d]	2,076	1,374	1,621	2,054	2,071	2,312	2,239	2,860	3,023	3,351	3,456
Public health	191	759	795	752	807	877	1,009	1,080	1,122	1,200	1,218
Dental services	3,090	3,139	3,269	3,375	3,299	3,236	3,378	3,830	4,381	4,362	4,434
Health administration	1,400	1,659	1,576	1,513	1,687	1,386	1,935	2,042	1,878	2,073	2,092
Research[e]	679	739	767	815	764	824	972	1,200	1,277	1,375	1,446
Total non-institutional	*24,004*	*25,062*	*26,181*	*27,662*	*28,074*	*29,211*	*31,600*	*35,528*	*37,740*	*39,671*	*41,722*
Total recurrent expenditure	**45,649**	**47,525**	**49,625**	**51,938**	**53,422**	**55,670**	**58,299**	**62,919**	**66,358**	**69,830**	**72,922**

(a) See Box 6.2 for explanation of constant price estimating method.

(b) Based on preliminary AIHW and ABS estimates.

(c) 'Other non-institutional services' is a summary of community and public health, dental services and administration.

(d) Includes expenditure that was previously classified as 'other non-institutional (nec)' as well as expenditure on community health services.

(e) Health services research expenditure has been allocated according to the level of government or the private sector organisation that actually undertakes the research activity, not according to source of funds.

Note: Some components may not add to totals due to rounding.

Source: AIHW Health Expenditure Database.

Table S44: Total public health expenditure by the Australian Government[(a)] and states and territories[(b)], by activity, 2001–02 to 2003–04 ($ million)

	2001–02			2002–03			2003–04		
Activity	**Australian Government**	**States and territories**	**Total**	**Australian Government**	**States and territories**	**Total**	**Australian Government**	**States and territories**	**Total**
Communicable disease control	24.9	161.8	186.7	25.1	175.4	200.5	30.4	173.5	203.9
Selected health promotion	46.2	172.8	219.0	45.2	167.8	213.0	44.3	170.3	214.6
Organised immunisation	52.5	124.7	177.2	53.1	202.3	255.4	49.5	218.5	268.0
Environmental health	15.1	57.3	72.4	13.3	60.9	74.2	19.2	61.9	81.1
Food standards and hygiene	15.1	17.7	32.8	13.3	20.5	33.8	14.6	21.0	35.6
Breast cancer screening	1.6	95.6	97.2	1.6	95.9	97.5	1.7	106.7	108.4
Cervical screening	66.9	23.7	90.6	62.8	22.3	85.1	65.6	23.5	89.1
Prevention of hazardous and harmful drug use	32.6	105.6	138.2	40.6	111.9	152.5	52.0	119.6	171.6
Public health research	57.7	18.9	76.6	65.0	22.7	87.7	68.6	24.8	93.4
PHOFA administration[(c)]	0.3	0.0	0.3	0.3	0.0	0.3	0.3	0.0	0.3
Total expenditure	**312.9**	**778.0**	**1,090.9**	**320.3**	**879.5**	**1,199.8**	**346.2**	**919.8**	**1,266.0**
Proportion of total public health expenditure (%)	28.7	71.3	100.0	26.7	73.3	100.0	27.3	72.7	100.0

(a) Australian government expenditure does not include its funding of state/territory expenditures 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 expenditures that are 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.

Note: Components may not add to totals, due to rounding.

Source: AIHW Health Expenditure Database.

Table S45: International comparison of health expenditure[a] as a proportion of GDP and per person, OECD countries, 1993, 1998 and 2003

	1993		1998		2003	
Country	Health to GDP (%)	Per person (A$)	Health to GDP (%)	Per person (A$)	Health to GDP (%)	Per person (A$)
Australia	**8.2**	**2,052**	**8.6**	**2,695**	**9.5**	**3,855**
Austria	7.8	2,236	7.6	2,558	7.5	3,108
Belgium	8.1	2,145	8.5	2,627	9.6	3,816
Canada	9.9	2,699	9.2	3,009	9.9	4,054
Czech Republic	6.7	1,018	6.6	1,187	7.5	1,752
Denmark	8.8	2,362	8.4	2,801	9.0	3,730
Finland	8.3	1,916	6.9	2,101	7.4	2,859
France	9.4	2,517	9.3	2,928	10.1	3,919
Germany	9.9	2,664	10.6	3,253	11.1	4,045
Greece	8.8	1,443	9.4	1,801	9.9	2,715
Hungary	7.7	855	7.3	1,014	8.4	1,713
Iceland	8.4	2,338	8.7	2,987	10.5	4,205
Ireland	7.0	1,392	6.2	1,941	7.4	3,309
Italy	8.0	2,049	7.7	2,363	8.4	3,048
Japan	6.5	1,829	7.2	2,283	n.a.	n.a.
Korea	4.3	607	4.5	807	5.6	1,450
Luxembourg	6.2	2,534	5.8	3,010	6.9	5,002
Mexico	5.8	532	5.4	559	6.2	787
Netherlands	8.6	2,279	8.2	2,678	9.8	4,018
New Zealand	7.2	1,494	7.8	1,898	8.1	2,546
Norway	8.0	2,271	8.5	3,030	10.3	5,139
Poland	5.9	507	6.0	727	6.5	1,004
Portugal	7.3	1,181	8.4	1,699	9.6	2,426
Slovak Republic	n.a.	n.a.	5.7	732	5.9	1,049
Spain	7.5	1,459	7.5	1,776	7.7	2,477
Sweden	8.6	2,203	8.3	2,568	9.4	3,649
Switzerland	9.4	3,217	10.3	3,904	11.5	5,104
Turkey	3.7	268	4.8	409	7.4	693
United Kingdom	6.9	1,651	6.9	2,066	n.a.	n.a.
United States	13.2	4,498	13.0	5,368	15.0	7,607
Average (unweighted) (27 countries)[b]	**7.9**	**1,879**	**7.9**	**2,285**	**8.9**	**3,260**
Average (weighted) (27 countries)[b][c]	**10.3**	**2,409**	**10.3**	**2,886**	**11.6**	**4,035**

(a) Estimated health expenditure according to the International Classification of Health Accounts excludes expenditure on health research.

(b) Excludes the Slovak Republic, Japan and the United Kingdom.

(c) Averages weighted by GDP or population.

Note: Expenditures converted to Australian dollar values using GDP purchasing power parities.

Sources: AIHW Health Expenditure Database; OECD 2005.

Table S46: Funding of health expenditure[(a)], by broad source of funds, OECD countries, 2003 (per cent)

Country	Government	Non-government	Total
Australia	**67.8**	**32.2**	**100.0**
Austria	67.6	32.4	100.0
Belgium[(b)]	74.5	25.5	100.0
Canada	69.9	30.1	100.0
Czech Republic	90.1	9.9	100.0
Denmark	83.0	17.0	100.0
Finland	76.5	23.5	100.0
France	76.3	23.7	100.0
Germany	78.2	21.8	100.0
Greece	51.3	48.7	100.0
Hungary	72.4	27.6	100.0
Iceland	83.5	16.5	100.0
Ireland	78.0	22.0	100.0
Italy	75.1	24.9	100.0
Japan	n.a.	n.a.	100.0
Korea	49.4	50.6	100.0
Luxembourg	89.9	10.1	100.0
Mexico	46.4	53.6	100.0
Netherlands	62.4	37.6	100.0
New Zealand	78.7	21.3	100.0
Norway	83.7	16.3	100.0
Poland	69.9	30.1	100.0
Portugal	69.7	30.3	100.0
Slovak Republic	88.3	11.7	100.0
Spain	71.2	28.8	100.0
Sweden	85.2	14.8	100.0
Switzerland	58.5	41.5	100.0
Turkey	70.9	29.1	100.0
United Kingdom	n.a.	n.a.	100.0
United States	44.4	55.6	100.0
Average (unweighted) (27 countries)[(c)]	**71.8**	**28.2**	**100.0**
Average (weighted) (27 countries)[(c)(d)]	**55.8**	**44.2**	**100.0**

(a) Estimated health expenditure according to the International Classification of Health Accounts excludes expenditure on health research.

(b) Data for Belgium are for recurrent expenditure on health, rather than total expenditure on health.

(c) Excludes Belgium, Japan and the United Kingdom.

(d) Weighted by total health expenditure.

Sources: AIHW Health Expenditure Database; OECD 2005.

Table S47: Out-of-pocket health expenditure per person[(a)], and as shares of total health expenditure, non-government health expenditure and household final consumption expenditure, OECD countries, 1993 and 2003

	1993				2003			
Country	Per person out-of-pocket expenditure (A$)	Share of total (%)	Share of non-govt (%)	Share of HFCE (%)	Per person out-of-pocket expenditure (A$)	Share of total (%)	Share of non-govt (%)	Share of HFCE (%)
Australia	**353**	**17.0**	**50.4**	**2.4**	**796**	**20.3**	**63.3**	**3.3**
Austria	n.a.	n.a.	n.a.	n.a.	595	19.2	59.2	2.7
Belgium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Canada	402	14.9	54.6	2.6	605	14.9	49.6	2.7
Czech Republic	52	5.2	100.0	0.7	146	8.4	84.6	1.3
Denmark	385	16.3	94.0	2.9	589	15.8	92.5	3.1
Finland	385	20.1	83.9	3.2	544	19.0	81.2	2.9
France	285	11.3	48.2	1.9	393	10.0	42.2	1.8
Germany	269	10.1	51.2	1.8	421	10.4	47.9	2.0
Greece	n.a.	n.a.	n.a.	n.a.	1,262	46.5	95.4	6.9
Hungary	107	12.6	100.0	1.7	421	24.6	88.9	3.9
Iceland	390	16.7	100.0	2.5	693	16.5	100.0	3.3
Ireland	210	15.1	56.5	1.9	441	13.4	60.7	2.3
Italy	406	19.8	83.7	2.7	632	20.7	83.3	2.9
Japan	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Korea	342	56.2	87.2	4.8	608	41.9	82.8	4.4
Luxembourg	141	5.6	78.5	0.7	351	7.0	70.3	1.2
Mexico	292	55.0	96.9	4.5	397	50.5	94.2	4.5
Netherlands	n.a.	n.a.	n.a.	n.a.	315	7.8	20.8	1.6
New Zealand	268	17.9	76.6	2.3	400	15.7	73.5	2.2
Norway	338	14.8	96.3	2.5	798	15.5	95.4	3.6
Poland	133	26.2	100.0	2.5	266	26.4	87.8	2.6
Portugal	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Slovak Republic	n.a.	n.a.	n.a.	n.a.	123	11.7	100.0	1.2
Spain	283	19.4	82.7	2.4	586	23.7	82.0	3.2
Sweden	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Switzerland	1,067	33.2	72.6	5.4	1,609	31.5	76.0	6.2
Turkey	84	31.5	93.7	1.7	142	20.4	69.9	2.3
United Kingdom	177	10.7	72.0	1.2	n.a.	n.a.	n.a.	n.a.
United States	757	16.8	29.6	3.3	1,071	14.1	25.3	3.0
Average (unweighted) (21 countries)[(b)]	**339**	**21.3**	**81.4**	**2.6**	**676**	**24.1**	**87.0**	**3.6**
Average (weighted) (21 countries)[(b)(c)]	**431**	**17.6**	**39.8**	**2.9**	**655**	**16.0**	**35.8**	**2.9**

(a) Estimated health expenditure according to the International Classification of Health Accounts excludes expenditure on health research.

(b) Excludes Austria, Belgium, Greece, Japan, Netherlands, Portugal, Slovak Republic, Sweden and the United Kingdom.

(c) Averages weighted by population, health expenditure or household final consumption expenditure.

Note: Expenditures converted to Australian dollar values using GDP purchasing power parities.

Sources: AIHW Health Expenditure Database; OECD 2005.

Table S48: Contributions income and direct health expenditure by private health insurance funds, constant prices[(a)], 1984–85 to 2003–04 ($ million)

Year	Contributions income ($ million)	Annual growth rate (%)	Benefits ($ million)	Annual growth rate (%)
1984–85	2,744	. .	2,268	. .
1985–86	2,976	8.5	2,643	16.6
1986–87	3,413	14.7	3,069	16.1
1987–88	3,726	9.2	3,331	8.5
1988–89	3,749	0.6	3,388	1.7
1989–90	3,865	3.1	3,566	5.2
1990–91	4,227	9.4	3,925	10.1
1991–92	4,753	12.4	4,169	6.2
1992–93	4,960	4.4	4,223	1.3
1993–94	5,011	1.0	4,334	2.6
1994–95	4,937	–1.5	4,423	2.0
1995–96	4,932	–0.1	4,577	3.5
1996–97	5,062	2.7	4,793	4.7
1997–98	5,343	5.5	4,694	–2.1
1998–99	5,579	4.4	4,812	2.5
1999–00	6,069	8.8	4,964	3.2
2000–01	7,547	24.3	5,620	13.2
2001–02	7,483	–0.9	6,469	15.1
2002–03	7,885	5.4	6,755	4.4
2003–04	8,377	6.2	7,071	4.7
Average annual growth rates				
1984–85 to 2003–04		1.6		2.0
1993–94 to 1997–98		8.1		7.6
1997–98 to 2002–03		5.3		5.0
1993–94 to 2003–04		6.0		6.2

(a) See Box 6.2 for explanation of constant price estimating method.

Sources: PHIAC annual reports.

Table S49: Net assets of registered health benefit funds, current prices, 1993–94 to 2004–05 ($ million)

Year	Net assets
1993–94	1,350.1
1994–95	1,409.0
1995–96	1,295.3
1996–97	1,173.5
1997–98	1,173.1
1998–99	1,304.4
1999–00	1,661.8
2000–01	2,387.0
2001–02	2,213.4
2002–03	2,325.1
2003–04	2,689.2
2004–05	3,331.4

Sources: PHIAC annual reports.

Table S50: Expenditure on health goods and services funded through health insurance funds, current prices, 2001–02 to 2003–04 ($ million)

	2001–02			2002–03			2003–04		
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	3,783	1,124	2,659	4,058	1,238	2,820	4,407	1,371	3,036
Public (non-psychiatric)	375	112	264	411	125	285	458	142	316
Private	3,407	1,013	2,395	3,648	1,113	2,535	3,949	1,228	2,721
Ambulance	127	38	89	133	40	92	130	40	89
Medical services	598	178	415	700	213	486	789	245	543
Other health professionals	420	125	295	470	143	327	499	155	343
Pharmaceuticals	64	19	45	75	23	52	71	22	49
Aids and appliances	330	98	232	341	104	237	367	114	253
Community and public health	1	—	—	1	—	—	1	—	1
Dental services	960	285	674	977	298	679	1,027	319	708
Total health benefits and levies	**6,281**	**1,866**	**4,410**	**6,755**	**2,061**	**4,694**	**7,290**	**2,268**	**5,023**
Health administration	804	239	565	825	252	573	843	262	581
Direct expenditure on health goods and services	**7,085**	**2,105**	**4,975**	**7,580**	**2,312**	**5,268**	**8,133**	**2,530**	**5,603**
Items not included in estimates on health goods and services									
Non-health ancillaries	72	21	50	73	22	51	46	14	31
Outstanding claims adjustment	42	12	30	–1	—	–1	91	28	63

(a) Premium rebate is pro-rated across all categories (including change in provisions for outstanding claims).

Note: Components may not add due to rounding.

Sources: PHIAC A quarterly reports; Department of the Treasury, Tax Expenditures Statement, various years.

Table S51: Health insurance funds reported expenses and revenues, current prices, 2001–02 to 2003–04 ($ million)

Operating expenses and revenue of funds	2001–02	2002–03	2003–04
Expenses			
Total cost of benefits[(a)]	6,459	6,953	7,525
State levies (ambulance)	99	102	105
Management expenses	804	826	852
Total expenses (not including provision adjustments)	7,362	7,881	8,482
Revenue			
Contributions income	7,266	7,885	8,637
Other revenue	66	194	296
Total revenue	**7,331**	**8,079**	**8,932**
Operating profit (loss) before abnormals and extraordinary items	(32)	196	447

(a) Includes adjustment to provisions for outstanding claims.

Note: Components may not add to totals due to rounding.

Sources: PHIAC annual reports.

Health labour force

Table S52: Employment in the health industry[(a)], August 1986 to August 2005

Year	Employed in health industry ('000)	All employed persons ('000)	Proportion of all employed persons (%)	Civilian labour force[(b)] ('000)	Proportion of civilian labour force[(b)] (%)
1986	483.9	6,918.5	7.0	7,516.3	6.4
1991	569.1	7,629.2	7.5	8,428.0	6.8
1995	582.1	8,218.7	7.1	8,938.6	6.5
1996	579.1	8,310.3	7.0	9,077.2	6.4
1997	601.6	8,306.4	7.2	9,066.5	6.6
1998	590.5	8,555.6	6.9	9,256.4	6.4
1999	592.0	8,692.1	6.8	9,315.7	6.4
2000	645.2	8,990.3	7.2	9,556.3	6.8
2001	658.4	9,061.8	7.3	9,707.7	6.8
2002	692.6	9,244.3	7.5	9,842.2	7.0
2003	680.4	9,396.4	7.2	9,965.6	6.8
2004	717.6	9,578.0	7.5	10,128.2	7.1
2005	755.2	9,976.7	7.6	10,478.1	7.2
1995 to 2005 increase (%)	**29.7**	**21.4**		**17.2**	

(a) Excludes persons employed in 'Veterinary services'.

(b) Includes unemployed persons looking for work.

Source: ABS cat. no. 6291.0.55.001 LM1 and E06.

Use of professional services

Table S53: Medical and optometrical services, fees and benefits under Medicare, 2000–01 to 2004–05

Year	Number of services (million)	Fees charged ($ million)	Schedule fees ($ million)	Benefits paid ($million)
GP attendances[(a)]				
2000–01	100.6	2,811.0	3,014.2	2,561.1
2001–02	99.9	3,037.0	3,226.4	2,742.2
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
Specialist attendances				
2000–01	19.3	1,303.8	1,197.5	1,005.3
2001–02	19.8	1,381.5	1,238.1	1,038.4
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
Obstetrics				
2000–01	1.5	120.1	78.5	62.5
2001–02	1.5	145.5	88.8	70.5
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
Anaesthetics				
2000–01	2.1	294.7	206.6	156.4
2001–02	2.0	369.7	248.0	187.4
2002–03	1.9	430.5	273.0	206.2
2003–04	2.0	460.4	276.6	209.1
2004–05	2.0	497.2	290.3	219.9
Pathology				
2000–01	62.1	1,246.7	1,375.6	1,156.8
2001–02	68.0	1,354.8	1,492.4	1,254.1
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

(*continued*)

Table S53 (continued): Medical and optometrical services, fees and benefits under Medicare, 2000–01 to 2004–05

Year	Number of services (million)	Fees charged ($ million)	Schedule fees ($ million)	Benefits paid ($million)
Diagnostic imaging				
2000–01	12.3	1,346.8	1,361.2	1,159.5
2001–02	12.8	1,432.0	1,429.6	1,216.9
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
Operations				
2000–01	5.8	1,074.5	875.7	688.7
2001–02	6.1	1,214.2	951.8	746.5
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
Optometry				
2000–01	4.2	164.6	191.5	162.9
2001–02	4.4	173.6	202.2	171.9
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
All other services[(b)]				
2000–01	5.9	476.0	447.3	373.6
2001–02	6.2	520.3	481.1	401.8
2002–03	6.4	564.6	513.6	429.4
2003–04	6.6	721.5	667.8	565.6
2004–05	7.3	1,063.0	1,006.7	900.2
Total services				
2000–01	213.9	8,838.0	8,748.1	7,326.8
2001–02	220.7	9,628.7	9,358.5	7,829.5
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

(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 2005.

Table S54: Medicare services, age-specific rates, 1986–87 to 2004–05 (services per person)

Sex/age group	1986–87	1991–92	2001–02	2002–03	2003–04	2004–05
Males						
0–4	7.83	8.85	8.56	8.36	8.25	8.58
5–9	4.41	4.99	4.61	4.33	4.21	4.24
10–14	3.71	4.22	4.16	3.88	3.85	3.81
15–19	3.71	4.38	4.55	4.33	4.27	4.24
20–24	4.20	4.57	4.89	4.61	4.46	4.49
25–34	4.58	5.12	5.59	5.39	5.34	5.43
35–44	5.31	5.99	7.23	7.03	7.00	7.15
45–54	7.13	7.65	10.05	9.88	9.89	10.11
55–64	9.59	11.66	14.88	14.80	15.04	15.49
65–74	10.92	12.53	23.17	23.33	23.99	24.89
75–84	15.42	16.99	20.32	21.88	24.02	26.61
85+	15.82	19.28	22.73	22.49	22.18	21.51
Crude rate	**6.18**	**7.10**	**9.17**	**9.11**	**9.27**	**9.62**
ASR(a)	**6.63**	**7.52**	**9.31**	**9.21**	**9.32**	**9.62**
Females						
0–4	7.08	8.06	7.82	7.62	7.49	7.76
5–9	4.35	4.98	4.59	4.30	4.14	4.18
10–14	3.90	4.38	4.20	3.96	3.93	3.88
15–19	6.55	7.62	8.03	7.72	7.61	7.54
20–24	9.93	10.19	10.97	10.51	10.29	10.29
25–34	10.87	11.35	13.15	12.85	12.84	13.13
35–44	9.15	10.34	12.40	12.16	12.16	12.52
45–54	10.37	11.70	14.61	14.29	14.22	14.45
55–64	11.98	13.80	17.94	18.02	18.06	18.36
65–74	14.75	16.42	23.23	23.45	23.98	24.87
75–84	18.06	20.11	25.36	25.68	26.37	27.81
85+	19.02	21.32	25.94	26.05	26.20	26.23
Crude rate	**9.63**	**10.79**	**13.28**	**13.15**	**13.22**	**13.58**
ASR(a)	**9.78**	**10.85**	**13.01**	**12.82**	**12.83**	**13.13**

(a) Age-standardised rate. Age-standardised to the Australian population as at 30 June 2001.

Source: DoHA 2005.

Table S55: Medicare services, age-specific rates, states and territories, 2004–05 (services per person)

Sex/age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Males									
0–4	9.33	8.10	8.99	7.49	8.68	6.82	6.96	4.96	8.58
5–9	4.67	4.41	3.97	3.62	4.08	3.51	3.27	2.39	4.24
10–14	4.17	3.82	3.73	3.41	3.59	3.26	3.11	2.07	3.81
15–19	4.62	4.18	4.12	3.84	4.32	3.71	3.49	2.54	4.24
20–24	5.00	4.47	4.16	3.88	4.79	4.11	3.54	2.36	4.49
25–34	5.98	5.52	5.06	4.57	5.48	5.11	4.43	3.25	5.43
35–44	7.94	7.09	6.91	6.07	6.97	6.10	5.82	4.56	7.15
45–54	11.07	9.83	10.18	8.82	9.59	8.71	8.53	7.16	10.11
55–64	16.87	15.05	15.76	13.50	14.42	13.46	13.14	10.94	15.49
65–74	26.66	24.61	25.12	22.03	23.48	21.36	21.07	14.84	24.89
75–84	27.97	26.86	26.54	24.32	25.39	21.32	21.96	16.47	26.61
85+	21.76	23.19	20.63	19.52	21.45	17.27	17.14	10.01	21.51
Crude rate	**10.53**	**9.55**	**9.43**	**8.22**	**9.64**	**8.57**	**7.41**	**5.06**	**9.62**
ASR(a)	**10.43**	**9.53**	**9.54**	**8.43**	**9.28**	**8.23**	**7.97**	**6.03**	**9.62**
Females									
0–4	8.45	7.22	8.23	6.90	7.87	6.15	6.21	4.39	7.76
5–9	4.57	4.34	3.95	3.59	4.06	3.53	3.35	2.48	4.18
10–14	4.10	3.97	3.80	3.61	3.78	3.41	3.27	2.43	3.88
15–19	7.79	7.18	7.76	7.45	7.59	7.63	6.60	5.98	7.54
20–24	11.01	9.71	10.36	9.80	10.18	10.73	8.62	8.55	10.29
25–34	13.86	13.09	12.78	12.62	12.68	12.10	11.84	9.39	13.13
35–44	13.31	12.62	12.14	11.67	11.97	11.18	11.26	9.36	12.52
45–54	15.34	14.25	14.59	13.26	13.89	13.23	12.35	10.72	14.45
55–64	19.49	17.93	18.79	16.60	17.47	17.00	15.66	13.01	18.36
65–74	26.24	24.38	25.69	22.43	23.55	21.50	22.06	16.60	24.87
75–84	28.64	27.94	28.45	25.82	26.54	24.06	24.74	18.66	27.81
85+	25.66	27.78	27.17	24.53	25.64	22.79	22.15	12.45	26.23
Crude rate	**14.42**	**13.55**	**13.42**	**12.32**	**13.55**	**12.49**	**11.34**	**8.26**	**13.58**
ASR(a)	**13.86**	**12.98**	**13.20**	**12.16**	**12.65**	**11.89**	**11.44**	**9.26**	**13.13**

(a) Age-standardised rate. Age-standardised to the Australian population as at 30 June 2001.

Source: DoHA 2005.

Table S56: Medicare services, percentage of enrolled persons by number of services, 2003–04

Sex/age group	Number of services 0	1	2	3	4	5 or more	Total
Males							
0–4	7.8	8.8	9.1	8.8	8.3	57.2	100.0
5–14	20.7	16.5	13.2	10.3	8.0	31.3	100.0
15–24	25.0	15.6	11.4	8.6	6.7	32.7	100.0
25–34	25.9	14.6	10.2	7.5	6.1	35.7	100.0
35–44	42.0	6.1	2.4	0.1	5.6	43.8	100.0
45–54	16.9	10.1	7.1	5.4	4.7	55.8	100.0
55–64	13.8	5.9	4.5	3.7	3.5	68.6	100.0
65–74	7.3	2.7	2.4	2.2	2.2	83.2	100.0
75–84	18.5	2.9	2.5	1.9	2.1	72.1	100.0
85 and over	23.4	3.9	2.9	2.2	2.6	65.0	100.0
Females							
0–4	8.6	9.9	10.0	9.4	8.7	53.4	100.0
5–14	21.0	16.9	13.4	10.3	7.9	30.5	100.0
15–24	11.6	9.4	8.5	7.3	6.4	56.8	100.0
25–34	9.3	6.6	5.8	5.5	5.2	67.6	100.0
35–44	10.7	7.0	5.7	5.6	5.3	65.7	100.0
45–54	9.3	5.7	4.7	4.5	4.3	71.5	100.0
55–64	9.4	3.6	3.2	3.1	3.1	77.6	100.0
65–74	5.7	2.0	2.0	2.0	2.1	86.2	100.0
75–84	10.6	1.9	1.9	1.7	1.9	82.0	100.0
85 and over	9.8	2.1	2.0	1.8	2.1	82.2	100.0

Source: HIC 2005.

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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, due to 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. The 1991 Australian population was used for these comparisons in previous editions of *Australia's health* back to the 1996 edition; some statistics may thus differ slightly from those in 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 Std	World Std
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

Source: 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:

$$\text{Average rate of change} = ((P_n/P_o)^{1/N} - 1) \times 100$$

where P_n = value in later time period

P_o = value in earlier time period

N = number of years between the two time periods.

The classification of deaths follows the Tenth 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 third edition of the *International Statistical Classification of Diseases and Related Health Problems, 10th revision, Australian modification* (ICD-10-AM) (NCCH 2002).

Symbols

$	Australian dollars, unless otherwise specified
—	nil or rounded to zero
%	per cent
g	gram
kg	kilogram
kJ	kilojoule
km^2	square kilometres
'000	thousands
m	million
mm	millimetre
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
npr	not previously reported
ppm	parts per million
wk	week
>	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%.

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Abbreviations

AACR	Australasian Association of Cancer Registries
ABS	Australian Bureau of Statistics
ACI	acute myocardial infarction
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
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 Convetion 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
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
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.

accommodation (of eye) How the eye automatically adjusts so it can focus at various distances, mainly by changing the shape of its lens.

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 primarily 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 does (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.

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.

AR-DRGs See *diagnosis related groups*.

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.

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 chronic inflammatory disease of the air passages causing widespread narrowing in them, obstruction of airflow, and episodes of wheezing, chest tightness and shortness of breath.

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, $kg \div m^2$. 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 (due to infection) or chronic (most often due to 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 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 (to name a few), 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 due to 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 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.

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 *Heart attack* and *angina*. 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 account of various aspects such as *life expectancy*, amount of *disability*, levels of disease *risk factors* and so forth.

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 cannot pump strongly enough to keep the blood circulating around the body at an adequate rate.

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 only be supplied to community patients 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's disease (Hodgkin's 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 forth) occurring during a given period. Compare with *prevalence.*

indicator A key statistic chosen to describe (indicate) a situation concisely, help assess 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).

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's disease* lymphomas and *non-Hodgkin's 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's 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's variety.

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.

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.)

overweight Defined as a body mass index of 25 or over. See also *obesity*.

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.

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 be used more specifically to refer to health factors that a person or their doctor perceives as a concern—a problem—that needs attention; and which, for example, the person may list in a survey or their doctor may list in clinical notes.

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 primarily 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 that aim to benefit 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 to 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 three 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.

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* usually arising in childhood or youth ('juvenile onset'), 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, chief, main or principal 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 onset of chest pain with exertion or by pain that accelerates by coming on more easily, more often or for longer than previously.

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 abnormal 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.

National Health Sector Performance Indicators 2003

The following list describes each National Health Sector Performance Indicator and points to where many of them can be found in this report.

No.	Indicator	Description	Table, figure or section in *Australia's health 2006*
Tier 1 Health status and outcomes			
1.01	Incidence of heart attacks	Incidence of acute coronary heart disease events ('heart attacks')	Section 2.6 subheading 'Coronary heart disease' (for people aged 40–90 years; see also Figure 2.19).
1.02	Incidence of cancer	Incidence rates for cancer	Table 2.25; see also Statistical Table S22 (for males and females separately).
1.03	Severe or profound core activity limitation	Severe or profound core activity limitation by age and sex	Figure 2.10; see also Section 4.3 (for people aged 25–64 years); Section 4.4 and Table 4.6 (for people aged 65 years or over).
1.04	Life expectancy	Life expectancy at birth	Statistical Table S11; see also Table 2.3 (for males and females separately); Figure 2.4; Statistical Table S10 (for a time series).
1.05	Psychological distress	Level of psychological distress as measured by the Kessler 10	Table 2.30 (for adults).
1.06	Potentially avoidable deaths	Number of potentially avoidable deaths	Not reported in *Australia's health 2006*.
1.07	Infant mortality	Infant mortality rates	Table 2.2; see also Section 5.1 subheading 'Are death rates falling?'; Figure 5.2; Statistical Table S6.
1.08	Mortality for National Health Priority Area diseases and conditions	Death rates for National Health Priority Area diseases and conditions	
		– Asthma	Figure 2.28.
		– Cancers	Section 2.6 subheading 'Mortality from cancer'; see also Statistical Table S17 (by states and territories); Section 2.5 subheading 'Trends in death rates for specific causes' (for males and females separately); Statistical Table S16 (for a time series by sex); Statistical Table S21; Table 4.5 (for people aged 25–44 years and 45–64 years).
		– Cardiovascular diseases	Section 2.5 subheading 'Trends in death rates for specific causes' (for males and females separately); see also Figure 2.20 (for coronary heart disease and cerebrovascular disease separately, by sex); Figure 2.19 (for coronary heart disease among people aged 40–90 years, by age group); Table 4.5 (for people aged 25–44 years and 45–64 years with ischaemic heart disease).
		– Diabetes	Section 2.6 subheading 'Diabetes—Mortality' (for males and females separately).

(*continued*)

No.	Indicator	Description	Table, figure or section in *Australia's health 2006*
		– Injuries	Table 2.43; see also Statistical Table S17 (by states and territories); Section 2.5 subheading 'Trends in death rates for specific causes' (for males and females separately); Table 4.5 (for people aged 25–44 years and 45–64 years with transport injuries or having undergone intentional self-harm).
		– Mental health	Section 2.7 subheading 'Mortality'; see also Figure 2.37 and Figure 2.38; Statistical Table S17 (by states and territories); Statistical Table S16 (for a time series by sex).
		– Musculoskeletal conditions	Section 2.6 subheading 'Arthritis and musculoskeletal conditions—Effects'; see also Statistical Table S17 (by states and territories); Statistical Table S16 (for a time series by sex).
Tier 2 Determinants of health			
2.01	Children exposed to tobacco smoke in the home	Proportion of households with dependent children (0–14 years) where adults report smoking inside	Figure 5.4; see also Table 3.8.
2.02	Availability of fluoridated water	Proportion of the population served by a reticulated water supply that provides satisfactory fluoride levels whether artificially fluoridated or naturally occurring	Section 3.2 subheading 'Water quality'; see also Box 3.1; Table 4.19 (by remoteness area).
2.03	Income inequality	Ratio of equivalised weekly incomes at the 80th percentile to the 20th percentile income	Not reported in *Australia's health 2006*; see Section 3.3 subheading 'Income'.
2.04	Informal care	Number engaged in informal care	Not reported in *Australia's health 2006*.
2.05	Adult smoking	Proportion of adults who are daily smokers	Section 3.5 subheading 'Tobacco smoking—Impact and prevalence' (for people aged 14 years and over).
2.06	Risky alcohol consumption	Proportion of the population aged 18 years and over at risk of long-term harm from alcohol	Table 3.12 (for the population aged 14 years and over); see also Section 4.2 (for people aged 15–24).
2.07	Fruit and vegetable intake	Proportion of people eating sufficient daily serves of fruit or vegetables	Table 3.16 (as inadequate intake among adults); see also Section 4.2 (for people aged 15–24 years).
2.08	Physical inactivity	Proportion of adults insufficiently physically active to obtain a health benefit	Section 3.5 subheading 'Physical activity—Prevalence and trends; see also Figure 3.4; Section 4.2 (for people aged 15–24 years).
2.09	Overweight and obesity	Proportion of persons overweight or obese	Table 3.18 (for persons aged 18 years or over); see also Section 4.2 (for people aged 15–24).
2.10	Low birthweight babies	Proportion of babies who are low birthweight	Statistical Table S5; see also Section 5.2 subheading 'How many babies are born with a low birthweight?'.
2.11	High blood pressure	Proportion of persons with high blood pressure	Section 3.6 subheading 'Blood pressure—Prevalence' (for persons aged 25 years or over); see also Figure 3.6.
Tier 3 Health system performance			
3.01	Unsafe sharing of needles	Percentage of injecting drug users, participating in surveys carried out at needle and syringe programs, who report recent sharing of needles and syringes	Section 3.5 subheading 'Use of illicit drugs—Injecting drug use'.

(*continued*)

No.	Indicator	Description	Table, figure or section in *Australia's health 2006*
3.02	Teenage purchase of cigarettes	Percentage of teenagers smokers who personally purchased their most recent cigarette	Section 3.5 subheading 'Tobacco smoking—Smoking among young people' (for smokers 12–15 and 16–17 years separately); see also Figure 3.3.
3.03	Cervical screening	Cervical screening rates for women within national target groups	Table 7.2.
3.04	Breast cancer screening	Breast cancer screening rates for women within the national target groups	Table 7.1.
3.05	Childhood immunisation	Number of children fully immunised at 12 months and 24 months of age	Table 5.9.
3.06	Influenza vaccination	Percentage of adults over 64 years who received an influenza vaccination for the previous winter	Section 3.5 subheading 'Vaccination—Influenza and pneumococcal vaccination for adults'.
3.07	Potentially preventable hospitalisations	Admissions to hospital that could have been prevented through the provision of appropriate non-hospital health services	Not reported in *Australia's health 2006*.
3.08	Survival following acute coronary heart disease event	Deaths occurring after acute coronary heart disease events ('heart attacks')	Not reported in *Australia's health 2006*.
3.09	Cancer survival	Five-year relative survival proportions for persons diagnosed with cancer	Not reported in *Australia's health 2006*.
3.10	Appropriate use of antibiotics	Number of prescriptions for oral antibiotics ordered by general practitioners for the treatment of upper respiratory tract infections	Not reported in *Australia's health 2006*.
3.11	Management of diabetes	Proportion of persons with diabetes mellitus who have received an annual cycle of care within general practice	Not reported in *Australia's health 2006*.
3.12	Delivery by caesarean section	Caesarean sections as a proportion of all confinements by hospital status	Not reported in *Australia's health 2006* by public or private hospital status; see Table 2.11 (for national average of jurisdictions); see also Figure 7.5 (for hospital separations).
3.13	Hysterectomy rate	Separation rates for hysterectomies	Not reported in *Australia's health 2006*; see Figure 7.6 (for hospital separations of females aged 15–69 years).
3.14	Hospital costs	Average cost per casemix-adjusted separation for public acute care hospitals	Table 7.18; see also Statistical Table S32 (for cost for separations by major diagnostic category).
3.15	Length of stay in hospital	Relative stay index by medical, surgical or other diagnostic related groups	Not reported in *Australia's health 2006*; see Statistical Table S32 (for average length of stay by major diagnostic category for public hospitals); see Statistical Table S32 (for average length of stay by major diagnostic category for private hospitals).

(*continued*)

No.	Indicator	Description	Table, figure or section in *Australia's health 2006*
3.16	Waiting times in emergency departments	Percentage of patients who are treated within national benchmarks for waiting in public hospital emergency departments for each triage category	Figure 7.10 (covering 73% of public hospitals).
3.17	Bulk billing for non-referred (general practitioner) attendances	Proportion of non-referred (general practitioner) attendances that are bulk billed (or direct billed) under the Medicare program	Section 7.2 subheading 'Bulk-billing'; see also Figure 7.2.
3.18	Availability of general practitioner services	Availability of general practitioner services on a full-time workload equivalent basis	Not reported in *Australia's health 2006*; see Table 6.21 (for data on a full-time equivalent basis).
3.19	Access to elective surgery	Median waiting time for access to elective surgery—from the date they were added to the waiting list to the date they were admitted	Section 7.5 subheading 'Elective surgery—waiting times' (covering 87% of public hospitals); see also Figure 7.8; Figure 7.9.
3.20	Electronic prescribing and clinical data in general practice	Percentage of general practices in the Practice Incentives Program who transfer clinical data electronically or use electronic prescribing software	Not reported in *Australia's health 2006*.
3.21	Adverse events treated in hospitals	Proportion of hospital separations where an adverse event was treated and/or occurred	Table 7.19.
3.22	Enhanced Primary Care services	Percentage of general practitioners using Enhanced Primary Care items	Not reported in *Australia's health 2006*.
3.23	Health assessments by general practitioners	Percentage of eligible older people who have received an Enhanced Primary Care annual voluntary health assessment	Not reported in *Australia's health 2006*.
3.24	Accreditation in general practice	Number of accredited practices participating in the Practice Incentives Program and the proportion of general practice services provided by these practices	Not reported in *Australia's health 2006*.
3.25	Health workforce	Graduates in pharmacy as a percentage of the total pharmacy workforce	Not reported in *Australia's health 2006*.
		Graduates in medicine as a percentage of the total medical workforce	Table 6.18.
		Graduates in nursing as a percentage of the total nursing workforce	Table 6.18.
		Percentage of health practitioners aged 55 years and over	Table 6.20 (for practitioners aged 45 and over).

Note: Some indicators that are 'Not reported' in *Australia's health 2006* may be available in the following references:

1. National Health Performance Committee 2004. *National report on health sector performance indicators 2003*. AIHW cat. no. HWI 78. AIHW: Canberra.
2. AIHW 2005. *Australian hospital statistics 2003–04*. Health Services Series No. 23. AIHW cat. no. HSE 37. AIHW: Canberra.

Index