AUSTRALIA’S HEALTH 1992

AUSTRALIAN INSTITUTE OF
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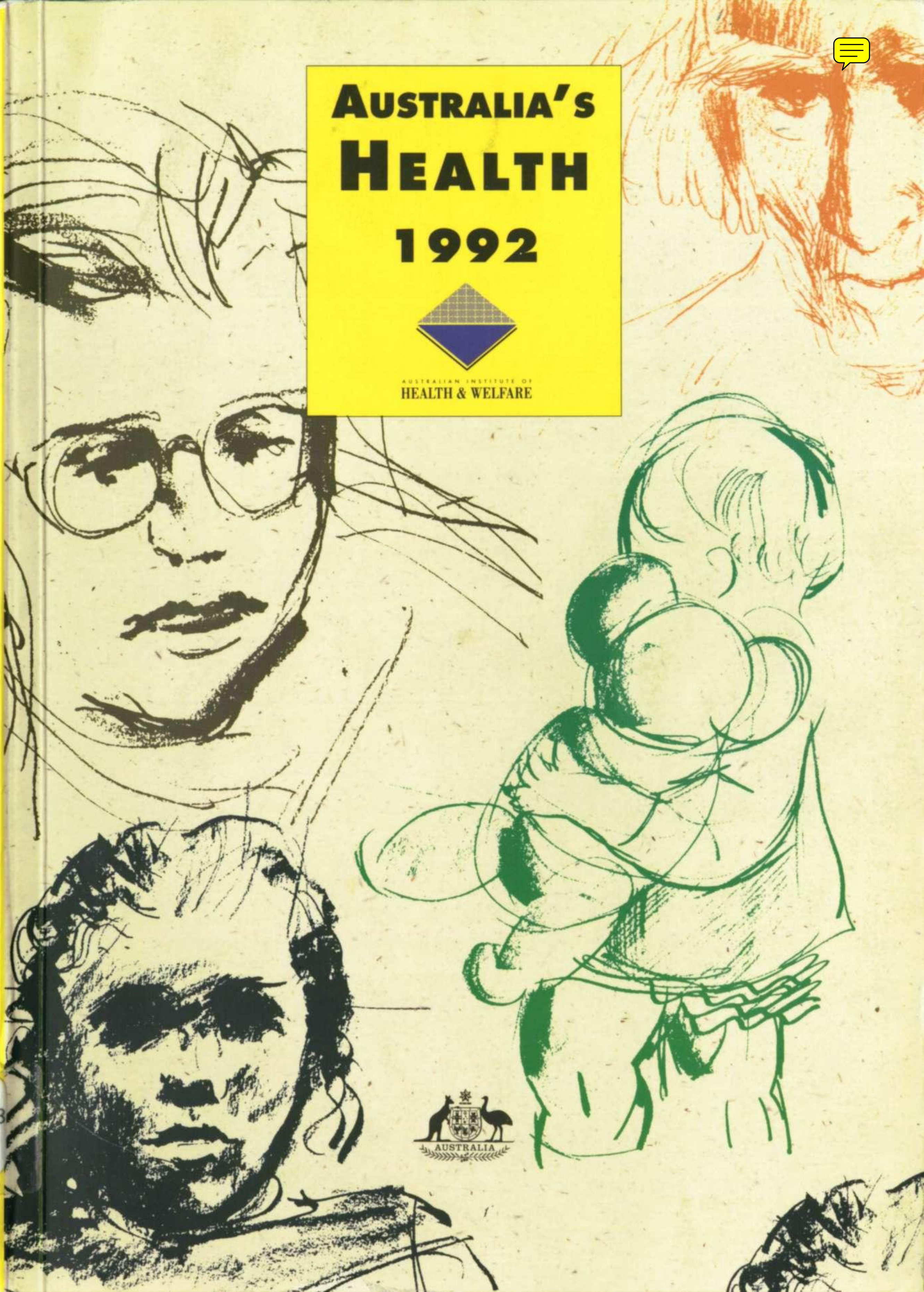

AUSTRALIA’S HEALTH 1992

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Australian Institute of Health and Welfare

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AUSTRALIA'S
HEALTH
1992

THE THIRD
BIENNIAL REPORT OF
THE AUSTRALIAN INSTITUTE
OF HEALTH AND WELFARE

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AUSTRALIAN INSTITUTE OF
HEALTH & WELFARE

The Honourable Brian Howe MP
Minister for Health, Housing and Community Services
Parliament House
CANBERRA ACT 2600

Dear Minister

As required under Subsection 31(1) of the *Australian Institute of Health and Welfare Act 1987*, the Board of the Institute is pleased to present to you *Australia's health 1992*, a report covering those aspects of Australia's health and health services for which data are currently being collected either nationally or in some States and Territories.

Yours sincerely

Peter Karmel

Peter Karmel
Board Chairman

16 June 1992

Australia's health 1992

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Preface

The Australian Institute of Health and Welfare (AIHW), formerly the Australian Institute of Health (AIH), is an independent statistics and research agency within the Federal Health, Housing and Community Services portfolio. The Institute has a national role, and provides research and statistical support to the Commonwealth, States and Territories, particularly under the auspices of the Australian Health Ministers' Advisory Council, the Standing Committee of Social Welfare Administrators, and State and Territory housing authorities.

The Institute's mission is to contribute to an improvement in the wellbeing of the Australian community, to promote the efficient use of health and welfare resources, and to improve the quality, availability and use of health and welfare information. The Institute addresses this mission by pursuing its legislative mandate to:

- collect and assist in the production of health- and welfare-related information and statistics;
- conduct and promote research into the health of Australians and their health services;
- develop statistical standards relevant to health and to health and welfare services;
- publish methodological and substantive reports on work carried out by or in association with the Institute;
- undertake studies into the provision and effectiveness of health services and technologies; and
- make recommendations on the prevention and treatment of diseases and the improvement and promotion of health and health awareness of the people of Australia.

The way the Institute tackles these functions is outlined in 'Health statistics: sources, developments and deficiencies', page 259.

Under its legislation, the Institute is required every two years to produce a health report providing:

- statistics and related information concerning the health of the people of Australia
- an outline of the development of health-related information and statistics.

This is the Institute's third biennial health report and covers the period ending 31 December 1991.

The Institute is also required to provide a biennial report on welfare services and the development of welfare service statistics. The first such report is due to be prepared within 6 months of 30 June 1993.

Structure of report

The structure of this report differs from that of the two previous biennial reports. This third biennial report comprises two parts. Part 1 describes specific aspects of the health of Australians and their health services. Part 2 summarises sources, developments and deficiencies in health-related information and statistics in Australia, and provides a range of health statistical information.

As well as describing the health of Australians (Chapter 2), and aspects of funding, resources and utilisation of health services (Chapter 3), Part 1 directs special attention to differentials in health status and incidence of health risk factors between various sub-groups of the Australian population (Chapter 4). These chapters are preceded by a brief chapter providing an overview of key aspects of the health and health services of Australians, along with background information on Australian health care arrangements and factors influencing health.

Part 2 contains a section not previously included in the Institute's biennial reports: to supplement the material examined in Part 1, a wide range of statistical tables have been developed. It is intended that updated versions of these tables, which include data on population and fertility as well as other health-related information, will be included in future versions of this biennial report. As other sources of health information develop, relevant tables will be added to the range included in this report.

A number of other statistical tables are included in Appendix 1. These tables are included for most of the Figures presented in the chapters of Part 1, and are for the benefit of readers who may wish to examine the data in more detail. Appendix tables are not included for those Figures derived from readily available sources.

Details of the conventions used in the preparation of this report are provided in Appendix 2.

Acknowledgements

All Institute staff contributed in some way to the preparation of this report, and their support is gratefully acknowledged. In addition to the major contributors, whose names are listed separately, a number of other staff members deserve special acknowledgement.

The location and compilation of background material was assisted by the Institute's library staff—Judith Abercromby and Alison Kennedy.

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The presentation of Figures, Tables and Boxes was guided by John Berzins.

Publication management and editorial review were provided by Nigel Harding and Deborah Beck. Conversion of the text for desktop publishing was undertaken by Lucy Pietrzak, and publication support was provided by Alannah Smith.

Of other agencies who assisted in the preparation of the report, the Institute is particularly grateful for the cooperation of State and Territory health authorities, the Commonwealth Department of Health, Housing and Community Services and the Australian Bureau of Statistics.

The Institute also acknowledges the assistance provided by the NHMRC National Centre in HIV Epidemiology and Clinical Research and by Worksafe Australia.

Commonly used abbreviations

ABS	Australian Bureau of Statistics
AHMAC	Australian Health Ministers' Advisory Council
AHMC	Australian Health Ministers' Conference
AIH	Australian Institute of Health
AIHW	Australian Institute of Health and Welfare
CDH	Commonwealth Department of Health (now HHCS)
DCSH	Commonwealth Department of Community Services and Health (now HHCS)
DSRU	AIHW Dental Statistics and Research Unit
DVA	Commonwealth Department of Veterans' Affairs
HIC	Health Insurance Commission
HHCS	Commonwealth Department of Health, Housing and Community Services (see also DCSH and CDH)
HTIC	Health Targets and Implementation (Health for All) Committee
ICD	International Classification of Diseases
NBHP	National Better Health Program
NCADA	National Campaign Against Drug Abuse
NHF	National Heart Foundation of Australia
NHS	National Health Survey (conducted in 1989–1990 by the Australian Bureau of Statistics)
NHMRC	National Health and Medical Research Council
NISU	AIHW National Injury Surveillance Unit
NPSU	AIHW National Perinatal Statistics Unit
OECD	Organisation for Economic Co-operation and Development
PBS	Pharmaceutical Benefits Scheme
RFPS	Risk Factor Prevalence Study (a series of three surveys conducted by the National Heart Foundation of Australia in 1980, 1983 and 1989)
RPBS	Repatriation Pharmaceutical Benefits Scheme
WHO	World Health Organization

Country abbreviations

Aus	Australia
Can	Canada
Fra	France
FRG	Federal Republic of Germany—West Germany
Ita	Italy
Jpn	Japan
NZ	New Zealand
Swe	Sweden

UK	United Kingdom
USA	United States of America

State and Territory abbreviations

ACT	Australian Capital Territory
NSW	New South Wales
NT	Northern Territory
Qld	Queensland
SA	South Australia
Tas	Tasmania
Vic	Victoria
WA	Western Australia

Part 1

Australia's health and health services

1 Introduction

Australia is one of the healthiest countries in the world and the health of Australians continues to improve, according to available health measures. At the same time, Australian health expenditure has been stable at around 8 per cent of gross domestic product for the last 15 years.

The first part of this report reviews evidence on the health of Australians and their health services. Chapter 2 presents information about mortality, sickness and disease, disability and handicap, and health risk factors.

Chapter 3 examines aspects of funding, resources and utilisation of health services in Australia, including health expenditure, private health insurance, health labourforce, the availability and use of hospitals and other health institutions, the use of medical services, health technologies, pharmaceutical drugs, and health promotion and disease prevention.

Special attention is directed in the report to differentials in health status and incidence of health risk factors between various sub-groups of the Australian population. Chapter 4 summarises differentials between sub-groups characterised by age, sex, Aboriginality, socioeconomic status, country of origin and place of residence.

This introductory chapter contains four sections: the first two (Sections 1.1 and 1.2) summarise key aspects of the health and health services of Australians. The other two sections present background information so that these summaries, and the chapters that follow, can be better understood.

Section 1.3 outlines the key features of the Australian health care system—the responsibilities of different levels of government and of the private sector, the nature of institutional and community health services, processes for coordination (including the place of health information and research), paying for personal health care, and approaches to health promotion and disease prevention. The roles of health services and a variety of other factors which determine health outcomes—individual and societal—are summarised in Section 1.4.

1.1 Overview of the health of Australians

Health status

In 1990, the marked decline in death rates that has occurred in Australia since the late 1960s continued, with death rates reaching their lowest levels ever.

Reflecting these declines, the life expectancy of Australians at birth increased, and the difference between males and females narrowed slightly to 6.1 years. For the first time, the life expectancy of females reached 80 years, with that of males being 73.9 years.

The changes in overall death rates and expectation of life at birth largely reflect further declines in death rates from diseases of the circulatory system. But, despite the continuing declines in death rates, this group of diseases (which includes heart disease and stroke) remains the leading cause of death, being responsible for 45 per cent of all deaths occurring in Australia in 1990. Death rates for injuries also continued to decline steadily.

Death rates for cancers, which were responsible for 26 per cent of deaths in 1990, have been steady for the past few years. Similarly, the most recent data (for 1982 to 1985) reveal that overall cancer incidence rates have been steady. The increase in incidence rates for some cancers has been offset by decreases in the rates for others.

In 1990, the Australian infant mortality rate of 8.2 infant deaths per 1,000 live births was slightly higher than the rate of 8.0 per 1,000 for 1989, but much lower than the rate of 8.7 per 1,000 for 1987 and 1988. Similarly, the perinatal mortality rate for 1990, 10.3 deaths per 1,000 total births, was slightly higher than the rate of 9.9 per 1,000 for 1989, but lower than the rates for previous years.

In 1988, there was slightly more than one hospital admission for every five people, with admission rates being higher for females than for males. For males, diseases of the digestive system were the most frequent cause of admission, followed by injuries. For females, by far the leading cause of admission was the group of conditions classified as complications of pregnancy. Disease of the genitourinary system was the next most frequent cause of admission for females.

In 1989–1990, two-thirds of Australian males and three-quarters of Australian females reported they had experienced an illness or injury in the previous two weeks, and two-thirds of males and females reported having a long-term health condition.

The dental health status of Australians continues to improve. Between 1979 and 1987–1988, the levels of edentulism declined, particularly for younger people. Many adults still have substantial experience of dental decay, but the extent of decay experienced by children has decreased markedly over recent years.

In 1988, almost one-sixth of Australians reported having one or more disabilities. More than one-eighth reported being handicapped in some way—4 per cent of all Australians were classified as severely handicapped.

Risk factors

Of the various risk factors identified as contributing to mortality, morbidity and disability, evidence suggests that one-sixth of Australian adults suffer from high blood pressure, and more than two-fifths have elevated levels of blood cholesterol. Almost 50 per cent of men and more than one-third of women are overweight or obese, and around one-third of adult Australians do not undertake any exercise for recreation, sport or fitness. Three-tenths of Australian men and more than one-quarter of Australian women smoke, and almost 10 per cent of men and 3 per cent of women consume alcohol at a level which puts their health at risk.

Differentials in health status and risk factors

There are substantial differences in mortality, illness experience and disability between various sub-groups of the Australian population characterised by age, sex, socioeconomic status, country of origin and place of residence. There are also differences in dental health status between sub-groups characterised by occupation and education, and age.

However, the differences between these various sub-groups are less than those between Australian Aborigines and Torres Strait Islanders and other Australians, at least in terms of mortality and hospitalisation. Australian Aborigines and Torres Strait Islanders remain the least healthy identifiable sub-population in Australia.

Mirroring the differences in health status between the sub-groups characterised by age, sex, socioeconomic status, country of origin and place of residence, there are also differences in risk factor levels.

1.2 Overview of Australia's health services

Funding and resources

In 1990–91, health expenditure by Australian governments and individuals was almost $31 billion, representing 8.1 per cent of gross domestic product (GDP). This is a slight increase from previous years, but of much the same proportion of GDP as expended through the 1980s.

Recurrent health expenditure accounted for around 93 per cent of total expenditure in 1988–89, with recurrent expenditure by hospitals alone accounting for 40 per cent of total expenditure.

Between 1975–76 and 1990–91, real per person health expenditure increased by 1.8 per cent per year, from $1,368 to almost $1,800. This increased expenditure was due mainly to the increased per person use of services and, to a small extent, to the ageing of the Australian population. In contrast to a number of similar countries, Australia has managed to limit the excess of health price inflation over general inflation.

The proportion of the Australian population covered by private hospital insurance has continued to decline since the introduction of Medicare in February 1984. In December 1991, 42 per cent of the population were covered by basic insurance, and less than 38 per cent had supplementary insurance cover. Since 1983, large declines in coverage have occurred among younger people, with levels among older people remaining steady.

In 1991, almost 8 per cent of employed Australians worked in the health industry. Over recent years, employment in the health industry has increased at a higher rate than employment in other industries. Detailed figures of the numbers of people currently employed in different occupations in the health industry will become available in late 1992, but it has been estimated that there are around 40,000 active medical practitioners, representing a doctor:population ratio of about 230 per 100,000.

In recent years, there has been considerable progress towards the development of uniform regulation of health occupations. This, together with the move to competency-based standards and assessment, should reduce the barriers to professional mobility that have existed in Australia.

During the late 1980s, the availability of acute hospital beds in the public sector continued to decline slowly, while availability in the private sector was steady. Despite the overall decline in bed availability, the level in 1989–90—5 beds per 1,000 population—was still well above the level targeted by State and Territory health authorities, and high compared with a number of other countries.

Between 1987–88 and 1989–90, the availability of beds in public psychiatric hospitals was steady—in marked contrast with the mid-1980s, for which period the move towards the care of many psychiatric patients outside hospitals resulted in substantial decreases in bed availability.

Commonwealth Government policy of accommodating older people who are less frail in hostels, rather than nursing homes, has resulted in changes in the ratio of beds in nursing homes to beds in hostels. In 1991, declines in bed availability for nursing homes, combined with increases in availability for hostels, resulted in a ratio of 61:39, well below the ratio of around 75:25 for the early 1980s.

Bed availability—in acute and psychiatric hospitals, and in nursing homes and hostels—varies across the country. There are substantial differences between States and Territories, and between major urban and other areas.

Utilisation of resources

During the late 1980s, the rate of admissions to acute hospitals increased, reflecting a combination of increased rates for people aged 65 years or older and decreased rates for younger people. However, the average time spent in hospitals by inpatients declined. As a result, the number of bed-days used by patients in acute hospitals decreased. Combined with the decline in bed availability in acute hospitals that occurred in the late 1980s, overall occupancy rates increased slightly.

Between 1987–88 and 1989–90, changes in hospital occupancy levels for the public and private sectors were similar (both increased slightly), but the factors influencing these changes were different. A greater increase in private sector admission rates compared to the public sector increase was largely offset by a small increase in private sector bed supply compared with a substantial decrease in the public sector bed supply.

In 1989–90, there were substantial differences in bed occupancy rates—between States and Territories, between teaching, base and other hospitals in major urban areas, and between major urban and other areas.

A significant change in the use of acute hospitals that occurred in the late 1980s was the increase in same-day surgery. In 1989–90, around 24 per cent of admissions to public acute hospitals, and about 27 per cent of those to private acute hospitals, were same-day patients.

Between 1987–88 and 1989–90, rates of admission to public psychiatric hospitals increased slightly, but were still much lower than the rates for the mid-1980s. Similarly, the number of bed-days used and the occupancy rates remained well below those for the mid-1980s.

Reflecting the trends to care for less dependent older people in their own homes or in hostels, the bed-day use in nursing homes decreased slightly between 1987–88 and 1989–90. There were substantial differences between States and Territories, and between major urban and other areas, in the use of beds in nursing homes.

In 1989–90, almost 151 million medical services were provided to Australians under Medicare—an average annual increase of 6 per cent from the number provided in 1984–85. In that period, the average use of medical services per person increased from 7.1 to 8.8 services (4.3 per cent per year). The increased use of pathology and radiology services per person was higher than the increase for other medical services.

The use of medical services increased with age, and was higher for females than for males at all ages except the first 10 years of life. The use of services varied substantially between States and Territories, between major urban and other areas, and between areas according to socioeconomic disadvantage. Part of the variation in the use of services appears to be due to differences in the supply of medical practitioners.

Between 1984–85 and 1990–91, the proportion of medical services which were direct-billed increased from 45 to 60 per cent. In 1990–91, 70 cent of general practitioner and 26 per cent of specialist consultations were direct-billed, but there were marked differences between States and Territories in these proportions.

Advances in health care technology continue to pervade all areas of health care and are often associated with increases in costs, with growth in the use of diagnostic technologies being particularly striking.

Consideration of the cost of health care technology has to be balanced by the benefits they provide. While there has in general been a limited effect on longevity of the population, new technologies have had a significant impact on morbidity and on patients' quality of life.

Questions of diffusion of technologies and access to them continue to provide health care administrators and providers with dilemmas. Some technologies have to be sited in a few centres, because of cost or limited demand. Other approaches such as less invasive surgical procedures have sometimes diffused very rapidly, providing good access, but raising questions as to standards of competence and comparative advantage over existing methods.

Developments in information technology continue to be rapid and offer the possibility of improved health care with better information to patients as well as to providers and funders of health technology.

Pharmaceutical drugs, which play an important role in health care in Australia, were responsible for expenditure of around $3 billion in 1990–91. For those components where estimates based on costs could be made, the proportion paid by Commonwealth programs increased from 71 per cent in 1988 to 75 per cent in 1990–91. In the same period, the proportion paid by hospitals declined from 19 to 15 per cent.

Of the $2.1 billion expended on prescription drugs supplied in 1990–91 through community pharmacies, the Commonwealth provided 57 per cent of the expenditure. Between 1980–81 and 1990–91, the proportion paid directly by patients increased from 35 to 43 per cent. Over this period, the total prescription use per capita increased from 7.7 to 9.0 prescriptions.

In the period 1980–81 to 1989–90, the rate of increase in use of prescriptions by pensioners was about 2.3 per cent per year, somewhat higher than the 1.4 per cent per year estimated for non-pensioners. This difference may have been caused by the increased real patient contribution for non-pensioners.

1.3 Australian health care arrangements: an overview

The health care system in Australia is pluralistic, complex and only loosely organised. It involves three levels of government, Federal, State and local, as well as public and private providers who may be individuals or institutions. Governments have been taking an increasing role in the financing of health services, but most medical and dental care and some other professional services are provided by private practitioners on a fee-for-service basis.

The extent to which functions are divided between different levels of government is a distinguishing feature of the Australian health care system. Although the relative responsibilities have changed greatly since federation in 1901, State and Territory governments retain the major responsibility for the public provision of health services, including public hospital systems, mental health services, public health regulation and licensing. The statutory obligations of local governments vary among States and Territories, but their main health responsibilities are in environmental control and in a range of personal preventive and home care services.

The Commonwealth Department of Health was not established until 1921, and its main responsibility for many years was quarantine. The Federal Government also exercised some responsibility concerning the health needs of veterans. Consequent to an amendment of the Constitution in 1946, the Commonwealth was given powers to make laws about pharmaceutical, hospital and sickness benefits, and medical and dental services. These powers, and the extension of conditional specific purpose grants under section 96 of the Constitution, have enabled the Commonwealth to expand its role in the health system.

Since 1956, the Commonwealth Government has introduced major benefit schemes covering medical, pharmaceutical, hospital and nursing home services, and it has established a number of other programs, many of which have involved funding through conditional grants to the States and Territories. Important recent programs in the latter category are directed towards health promotion, the control of alcohol and drug abuse, and the campaign against AIDS.

In recent years, government health authorities have been taking an increasing interest in the health status of the nation, and additional resources have been provided for the measurement of health, the evaluation of health services, the promotion of wellbeing and the prevention of illness and disability.

Organisation and structure of health services

Commonwealth, State and Territory health authorities

The structures of the various Commonwealth, State and Territory health authorities are described in *The Australian health care system 1991* (Grant, Lapsley 1992), an annual publication of the School of Health Administration of the University of New South Wales. Comparison of the most recent edition with previous editions show that the structures have been undergoing frequent change, not only by the reallocation of functions to new and different divisions within departments, but by the transfer of functions to and from other departments, or by the amalgamation of whole departments. Administrations in peripheral health units have had to make rapid adjustments to these changes in the central funding agencies.

At the Commonwealth level, the most recent change was the expansion in 1991 of the Department of Community Services and Health to become the Department of Health, Housing and Community Services (HHCS).

A separate statutory authority, the Health Insurance Commission (HIC), administers the Medicare program of universal health insurance and the Pharmaceutical Benefits Scheme. Semi-autonomous bodies within HHCS administer the National Acoustic Laboratories and the radiation laboratory, and the Ultrasonics Institute is now a part of CSIRO.

States and Territories display at least as much volatility as the Commonwealth, and health administrations have been reorganised or renamed repeatedly, usually as

Departments or Commissions. Some jurisdictions have combined health and community services functions, while others have kept them separate. The momentum has been towards the creation of central agencies with varying degrees of delegation of responsibility to regional or area authorities. The principal functions of State and Territory authorities include:

- hospital services
- mental health programs
- dental health services
- systems of extended care
- child, adolescent and family health services
- community health services
- aged care services
- services for disabled people
- Aboriginal health programs
- women's health programs
- health promotion
- rehabilitation systems
- nursing homes
- occupational health and safety programs
- regulation, inspection, licensing and monitoring of premises, institutions and personnel

The central authorities at State and Territory level are mainly concerned with the determination of policy, budgeting and financial control, planning, standards of performance and their measurement, program and budget reviews, industrial and personnel matters and major capital works.

The role of other government agencies

Most health programs in the public sector are administered by health authorities, but other government departments and instrumentalities have important roles. The Commonwealth Department of Veterans' Affairs currently administers repatriation general hospitals and auxiliary hospitals in the States, and it arranges medical care outside of institutions for ex-service personnel and other beneficiaries. However, it has been proposed that repatriation hospitals will be integrated into State hospital systems by 1995.

Between the early 1970s and 1984, specific assistance for Aboriginal health from federal sources was provided by the Commonwealth Departments of Aboriginal Affairs and Health. Between 1984 and 1991, this assistance was provided through the Commonwealth Department of Aboriginal Affairs, and is now administered by the Aboriginal and Torres Strait Islander Commission.

Occupational health policy and standards development are functions of the National Occupational Health and Safety Commission, but the routine administration of relevant legislation is the responsibility of State and Territory governments which allocate the functions to a variety of agencies.

Environmental health and hygiene

Health surveyors, usually employed by local governments, undertake surveillance of environmental hygiene and sanitation to ensure compliance with regulations made under State and Territory public health statutes. Statutory water supply authorities are responsible for the quality of piped water and sometimes for sewage disposal and drainage. Another set of authorities is responsible for monitoring and regulating air quality. In most States and Territories, central agencies have been established to control the disposal of wastes. They administer the disposal sites in metropolitan areas, but the collection and transport of waste material is the responsibility of local government.

Institutional and community health services

Public general hospitals in most States and Territories are administered by hospital boards that are constituted as corporate entities with board members subject to approval by the relevant State or Territory Minister. Some are administered by religious or charitable bodies. Where area health boards have been established, as in New South Wales, the public hospitals are managed by executive personnel responsible to the area board. Public hospitals have become increasingly dependent on State grants and are required to comply with conditions of subsidy. About 22 per cent of all hospital beds are in private hospitals run by religious or charitable organisations or by proprietors operating for profit.

Some public psychiatric hospitals are now administered by boards similar to those for public general hospitals, but most continue to be run as State institutions. However, psychiatric admission and treatment centres have been established in selected public hospitals, and residential care for mentally ill patients has been provided in small scale accommodation in the community in recent years.

Nursing homes provide accommodation and long term nursing care for chronically ill, disabled or demented patients. The pattern of ownership is the inverse of that for hospitals, with only about 20 per cent of the beds in State administered institutions, the remainder being privately controlled. The Commonwealth incurs most of the financial burden of running nursing homes, as it provides a daily monetary benefit to assist each resident to meet the cost of care in an approved nursing home; the resident is not required to contribute more than 87.5 per cent of the sum of the single rate pension and rent assistance.

The structure of the residential care program was re-shaped in 1985 by the application of a planning ratio of 40 nursing home beds and 60 hostel places for each 1,000 persons aged 70 years and over, on a regional basis. In 1991, the planning ratio for hostels was reduced to 55 beds per 1,000 people aged 70 years or over. To ensure that only those with high dependency are taken into residential care, geriatric assessment teams have been established nationally. They recommend a large proportion of people for care outside of institutions and make appropriate referrals to other services. In 1985, the Home and Community Care (HACC) program was established to provide support for services to frail aged and younger disabled persons who are not in residential care. The objective is to enhance opportunities for them to avoid inappropriate admission to institutions. The program is administered jointly by the Commonwealth and each State and Territory, and innovative services have been introduced to meet the needs of groups with special requirements.

Medical care outside hospitals is based on general practitioners in private practice who constitute the principal gateway to specialist services. In addition, State and local government health authorities are active in the fields of health promotion and disease prevention. Advisory services are provided at baby health centres, antenatal clinics and community health centres. Immunisation clinics are offered, but levels of protection vary widely and often fall short of the optimum.

Community mental health services and community services for older people expanded quite rapidly after the early 1970s and are provided under a variety of government and non-government auspices. The system grew in a relatively uncoordinated manner, and contact with private clinical services has been variable.

Measures have been taken to ensure that people with handicaps are able to gain access to services in all parts of the various systems of health care, and special services and facilities have been provided for them by State and Territory governments and non-government organisations. HHCS administers financial programs that offer rehabilitation, employment and hearing services for people with disabilities. Emphasis is given to access to services that enable participation in integrated community activities.

Information, research and coordination

The operating divisions of government health authorities routinely collect and analyse data produced in the course of managing their programs. Selected information of this kind is transmitted to the Australian Institute of Health and Welfare, and other agencies, where it is incorporated into national datasets which are used in the preparation of reports on the health of Australians and their health services. Large scale population surveys of health and health services are conducted by the Australian Bureau of Statistics.

The National Health and Medical Research Council (NHMRC), established in 1936, is responsible for the coordination of public health policy at the national level. Its principal committees today are concerned with medical research, health care, public health, public health research and development, and health ethics (see Box 1.1).

Box 1.1: National Health and Medical Research Council (NHMRC)

The Council was constituted under an Order in Council by the Governor-General in September 1936. Its role is to inquire into, and to advise and make recommendations to the Commonwealth, States and Territories, and the Australian community, on matters relating to the improvement of health, the prevention of disease, health care, medical care, dental care, health research and medical research, and ethical issues in relation to health.

It also advises and makes recommendations to the Commonwealth on expenditure on health and medical research generally, and advises the Minister for Health, Housing and Community Services on the application of the Medical Research Endowment Fund for the purposes of the Medical Research Endowment Act 1937.

NHMRC sponsors and supports investigations and recommends priorities, including funding priorities, in the fields of health care, health services, and health and medical research.

Following the 1990 triennial review of NHMRC, the Minister has commenced moves to establish Council as a statutory body, underlining its importance as a major national advisory body on health issues and enshrining its independence and permanence.

Recommendations from the Council are considered by the States and Territories individually, and some of them collectively at the Australian Health Ministers' Conference (AHMC) (see Box 1.2).

Box 1.2: Australian Health Ministers' Conference (AHMC)

Major responsibilities with respect to health are divided between the Commonwealth, and State and Territory governments.

At the national level, the Commonwealth Government is primarily concerned with the development of broad national policies, and influences policy-making in health services through its financial arrangements with the State and Territory governments, through the provision of benefits and grants to organisations and individuals, and through the regulation of health insurance. The State and Territory governments are responsible for the provision and administration of health care services in their respective State or Territory.

The Australian Health Ministers' Conference (AHMC) and its advisory body, the Australian Health Ministers' Advisory Council (AHMAC) (see Box 1.3) provide a mechanism for Commonwealth, State and Territory governments to discuss matters of mutual interest concerning health policy, services and programs. Neither the Conference nor the Council has statutory powers, and decisions are reached on the basis of consensus. Constitution of each of the two bodies rests on the formal agreement by the Commonwealth, State and Territory governments of their respective memberships and functions.

AHMC comprises the Commonwealth, State and Territory Ministers responsible for health. In addition to this formal membership, other Commonwealth Ministers may be invited to speak on items relevant to their portfolios. The New Zealand and Papua New Guinea Health Ministers may attend meetings as observers, although the Conference is currently considering a proposal for New Zealand and Papua New Guinea to become full members of the Conference.

AHMC was formed following the June 1988 Conference of Commonwealth and State Health Ministers. Before this, the Commonwealth Government only attended meetings of State Health Ministers at their invitation. The Conference has generally met once a year, although additional specific meetings have been held when issues have arisen requiring urgent attention by Ministers—for example, Medicare, AIDS, drug abuse. In addition, several Ministers may be delegated by the Conference to hold discussions on matters of particular concern such as the meeting held with the Media Council of Australia on voluntary controls on cigarette and alcohol advertising, or the special Meeting of Northern Australian Health Ministers and the Commonwealth Minister for Community Services and Health to discuss the delivery of health services in rural and remote tropical Australia. Joint meetings with Ministers representing other portfolios have been held to discuss issues crossing Ministerial responsibilities such as Aboriginal health strategies and AIDS in prisons. An historic joint meeting with the Council of Social Welfare Ministers was held in March 1991 to discuss the functional reviews of a number of programs following agreement at the Special Premiers' Conference in October 1990.

Chairmanship of AHMC rotates among the members annually. Since 1984, the Secretariat for AHMC has been located in the Commonwealth Department of Health, Housing and Community Services.

The latter body is advised, principally on resource matters and financial issues, by the Australian Health Ministers' Advisory Council (AHMAC), a committee consisting of the heads of the Commonwealth, State and Territory health authorities and the Commonwealth Department of Veterans' Affairs (see Box 1.3). Specific national bodies have been established to coordinate information and advice on major problems such as drugs and alcohol abuse, and AIDS.

Box 1.3: Australian Health Ministers' Advisory Council (AHMAC)

AHMAC was established by the April 1986 AHMC to replace the Standing Committee of Health Ministers (SCOHM) and the Australian Health Services Council (AHSC). The inaugural meeting of AHMAC was held in June 1986.

AHMAC was established to provide effective support to the Australian Health Ministers' Conference (AHMC) and to consider matters relating to the coordination of health services across the nation.

Membership of AHMAC comprises:

- *the heads of State and Territory health authorities*
- *the Secretary, Commonwealth Department of Health, Housing and Community Services*
- *the Secretary, Commonwealth Department of Veterans' Affairs*
- *the option of one other member from each of the above, with a further option of a third member from the Commonwealth Department of Health, Housing and Community Services*
- *the Chairperson of the National Health and Medical Research Council.*

The Director of the Australian Institute of Health and Welfare may attend AHMAC meetings as an observer, and the State or Territory providing the Chair shall have the option of nominating a third member (including the Chair).

Under its terms of reference, AHMAC shall:

- *consider matters referred to the Council by the Australian Health Ministers' Conference*
- *consider health matters referred by any Health Minister or the Minister for Veterans' Affairs*
- *consider health matters referred by any member of the Council with the approval of that member's Minister*
- *report on the above matters to AHMC.*

AHMAC may establish standing committees to serve ongoing matters of concern to the Council and AHMC, as well as ad hoc working parties or taskforces to investigate and report on specific issues.

Current standing committees include the Intergovernmental Committee on AIDS, National Coordinating Committee on Therapeutic Goods, Australian Coordinating Committee on Organ Registries and Donation, Subcommittee on Women and Health, the Medical Workforce Data Review Committee and the Australian Communicable Diseases Network Advisory Committee.

The full AHMAC has two plenary meetings a year, with one of these being held 14 to 21 days before the AHMC meeting, to review the Conference agenda with the Chairman of AHMC with a view to streamlining, possibly through the integration and reordering of items.

An Executive Committee acts for AHMAC between Council meetings, and determines the agenda for meetings of the Council.

In addition to research that is funded by NHMRC, HHCS administers separate extra-mural research programs primarily to provide additional program management information. Some States and the Northern Territory provide substantial infrastructure support for medical research institutes established in association with their universities and teaching hospitals, and revenue from special tobacco taxes goes to support health research as well as health promotion activities.

Paying for personal health care

In Australia, a universal system of health insurance known as Medicare came into operation in 1984. Eligibility for Medicare benefits is open to all persons normally resident in Australia except foreign diplomats and their dependants. Short-term visitors do not have entitlements. A schedule of fees has been established and Medicare benefits for general practitioner services are calculated at the rate of 85 per cent of the schedule fee for each item of service. At April 1992, benefits for specialist care out of hospital have been calculated at the rate of 85 per cent of the schedule fee, or that fee less $26.80, whichever is the greater amount. The gap is linked to the Consumer Price Index and is adjusted on 1 November each year. Diagnostic services attract somewhat lower benefits. Benefits are also paid for services provided by optometrists and for oral surgery performed by dental surgeons.

The schedule fees are shown in published lists of items of service and the fees applicable to those items. Doctors are not obliged to abide by the schedule fees, but if they bill HIC directly for any item of service to a patient, the amount payable is the Medicare benefit and the patient is not required to pay any additional amount. The proportion of all services direct-billed in this way rose from 45 per cent in 1984–85 to 60 per cent in 1990–91, by which time 70 per cent of general practitioner services were direct-billed. In addition, many doctors who decline to direct-bill charge pensioner patients and social security beneficiaries at the Medicare benefit rate.

For private patients in hospitals the Medicare benefit is only 75 per cent of the schedule fee, but the gap between benefit and schedule fee is insurable. In other circumstances, gaps cannot be covered by private insurance, and insurance to cover amounts paid in excess of the schedule fee is prohibited. Pensioners and social security beneficiaries are not usually required to pay the gaps between schedule fees and Medicare benefits. For all beneficiaries (individuals and registered families), if the sum of the gaps between benefits and schedule fees exceeds $246 a year, the full schedule fee is reimbursed for services during the remainder of the year. This 'safety net' threshold is also linked to the Consumer Price Index, with adjustments taking place each calendar year.

Agreements between the Commonwealth and State and Territory governments provide for all Medicare beneficiaries to obtain inpatient and non-inpatient care at public hospitals without charge. Medical care is provided for such 'public' patients (at no cost to them) by doctors appointed by the hospitals. Private health insurance can be purchased to cover charges in private hospitals, and for private status in public hospitals. Private patient charges in public hospitals are set at levels agreed by the Commonwealth. Registered health benefit funds also sell ancillary insurance for services not covered by Medicare, notably private dentistry, physiotherapy, chiropractic and appliances, and for prescribed medicines not covered by pharmaceutical benefits.

Pharmaceutical benefits are provided for prescribed items purchased at retail pharmacies (see Box 3.4, page 158). The items that attract benefits are listed in a frequently revised schedule. Unsubsidised prescribed items can also be bought at pharmacies, and many remedies can be purchased 'over the counter' without prescription. When listed prescribed items are supplied, the pharmacist recoups the cost by way of a patient contribution and a Commonwealth subsidy which varies according to the status of the patient.

At April 1992, the maximum patient contribution (except for items where a special patient contribution or a brand price premium applied) was $15.70 per prescription for general beneficiaries, or an amount of $2.60 for concessional beneficiaries (pensioners, low income groups and welfare recipients) (see also Box 3.4, page 158). To provide protection for those who have a need for high volume use of prescription drugs, a safety net applies:

- for general beneficiaries, once the first level threshold of $309.90 has been reached, a Safety Net Concession Card is issued. Prescriptions cost $2.60 each for the next $51.60 expenditure, and further benefits are free of charge to the patient for the remainder of the calendar year
- for concessional beneficiaries, free benefits are provided after a threshold amount of $135.20 has been spent in each year.

Health promotion and disease prevention

To varying degrees, the promotion of health and the prevention of disease are components of all the health services so far mentioned, and these aspects of health care have been receiving increasing emphasis in recent years. Specifically designed preventive services include infant health centres, school medical and dental services, the fluoridation of water supplies, immunisation programs, anti-smoking campaigns, the national AIDS program and the National Campaign Against Drug and Alcohol Abuse. State and Territory health authorities have branches concerned with health education services, and health promotion using community development approaches.

There is an increasing realisation, however, that the health status of the nation is related not only to its health services, but also to levels of nutrition, education, employment, income and housing, to standards of hygiene generally, to the degree of safety in the environment and to the availability of cultural and recreational amenities. These matters are influenced both by the market and by financing and regulatory arrangements at different levels of government. Most of the systems are administered outside the immediate purview of health authorities, but Australian governments have begun to show some commitment to the concept that all areas of public policy should be characterised by explicit concerns for health.

In that context, health authorities are assuming responsibility for monitoring the impacts on health of adverse social, economic and physical environments. The aim is to create a supportive and sustainable environment that helps people to lead healthy lives. Health workers have long been involved in motivating individuals to alter their health-related behaviours in desirable ways. The change that has come about since the advent of the 'new public health' in the 1980s is based on the premise that people are not entirely free to choose particular lifestyles. They adapt their behaviour to their life situations. Consequently, some emphasis must be placed on the alteration of adverse influences on health that are beyond the control of the individual. This approach is recognised in the National Better Health Program established by the Commonwealth, State and Territory governments in 1988 (see 'National Better Health Program', page 167).

1.4 Factors influencing health

As noted in the previous section, there is an increasing realisation that health status is related to a wide variety of factors, and that many of these factors are outside the direct control of individuals.

In the early 1970s, at a time when there was increasing questioning of the role of treatment services, *A new perspective on the health of Canadians* (Lalonde 1974) reminded health workers that the development of disease in individuals resulted from the interaction of a number of factors. The Lalonde Report contained little that was new, but its health field concept has influenced subsequent thinking about health and disease.

The Lalonde Report has been criticised for focusing on disease in individuals, with insufficient attention to environmental aspects, particularly the place of individuals within society (Buck 1985). Partly in response to this weakness, recent work in Europe has directed more attention to the interrelationships of individual and societal factors in considering patterns of health in populations.

In attempting to understand the nature of disease and health in individuals and populations, there is value in summarising both the Lalonde framework and the more recent societal-level explanations.

Lalonde's health field concept

According to the health field concept introduced in the Lalonde report, health outcomes can be seen as the result of interactions between four elements:

- *human biology*—genetic and biological characteristics
- *lifestyle*—personal behaviour, such as smoking, alcohol consumption, diet and physical activity
- *environment*—includes social as well as physical factors
- *health care*—access to, and use of, prevention, treatment and rehabilitation services.

Human biology

A person's genetic composition is an important determinant of health and disease. The most obvious manifestations of genetic disorders are chromosomal abnormalities (such as occur in Down's and Turner's syndromes) and single-gene defects (for example, hemophilia and cystic fibrosis). As well as these types of disorders, which occur in about 1 per cent of births (McKeown 1988), it is being recognised increasingly that genetic composition plays a major role in a range of other diseases (Allison 1984). Examples are the abnormal hemoglobins and diseases linked with genes of the major histocompatability complex. The latter diseases include ankylosing spondylitis, celiac disease and some forms of diabetes mellitus.

Apart from these clear examples of the importance of a person's biology in disease processes, genetic composition also influences the duration of human life, and some of the diseases and disabilities associated with old age (McKeown 1988). The expression of some diseases, such as the sex-linked hemophilia and muscular dystrophy, is influenced by the sex chromosomes, but the extent to which genetic composition influences the expression in each sex of most diseases is not clear.

Lifestyle

Recognition of the influence of individual behaviour on health goes back to at least the time of Hippocrates, but increased understanding in the twentieth century of disease processes has focused attention on the role of behaviour change in health promotion and disease prevention (Ramsay Somers, Weisfeld 1986). At the same time, there is a recognition that social and cultural factors have a major influence on individual behaviour or lifestyle.

A number of lifestyle factors have been linked closely with health outcomes (Last 1987:229). These include:

- diet
- exercise
- participation in games, hobbies and other uses of leisure time
- substance use (tobacco, alcohol, tea/coffee, prescribed drugs, self-medication, illicit substance use)
- safety practices (such as seat belt use and use of safety equipment in home and at work)
- health related attitudes, knowledge and values (for example, immunisations, health maintenance procedures including breast self-examination, Pap smears and blood pressure checks)
- sexual behaviour.

Most health surveys now include measurement of at least some of these lifestyle or risk factors (see Section 2.5), but it is important to remember that they are intimately associated with social, economic and cultural factors (see Section 4.4).

Physical and biological environment

For most of human existence, the physical environment has been recognised as exerting a major impact on health and disease, the nature of the impact depending on the type and extent of environmental hazards to which people were exposed. Many of the gains in health that occurred in Australia up to the middle of this century resulted from improvements to the physical environment, particularly related to housing, water and food quality, and efficient sewage disposal. Even today, the health of the public is protected by systems which safeguard these aspects.

With the control of these basic environmental aspects, greater attention has been directed to other physical environmental hazards, which include the following broad groupings:

- air quality and pollution (indoor and outdoor)
- water quality, additives and pollutants
- food quality and additives
- noise pollution
- waste disposal—toxic and non-toxic
- occupational health and safety
- building standards
- pesticide and herbicide residues
- chemical use and residue
- natural disasters
- pests
- natural resource degradation

As well as these groups, increasing attention is being directed to the macro-environmental issues of ozone depletion in the upper atmosphere, and global warming. Both of these aspects could have a major impact on human health worldwide.

The combined effects of possible climatic changes in Australia by the year 2030 and ozone depletion could well result in:

- increased skin and other cancers, ocular damage and viral and fungal diseases, due to increases in ultraviolet radiation
- increased risk of mosquito-borne diseases
- increased incidence of heat-related conditions
- increased level of asthma reactions
- increased risk of natural disaster-related injury and death (NHMRC 1989; Ewan, Bryant, Calvert 1990).

For many environmental hazards, linking specific hazards with particular human diseases is difficult, given the number of intervening factors, the quality and availability of data, and the time-lag between exposure to the environmental hazard and the onset of disease. The health of one person exposed to an environmental hazard may suffer seriously, but another person similarly exposed may have a developed resistance to the ill-effects, either by preventive action (for example, vaccination), or by chance.

Protection of the public's health requires control or avoidance of known or suspected environmental hazards. To this end, governments have established a number of regulatory and/or monitoring bodies. Their activities, however, are often poorly coordinated with health authorities.

Social environment

In recent years, the importance of social factors in the development of many diseases has become increasingly clear, despite persisting uncertainties about the actual causative mechanisms (Last 1987; Marmot, Morris 1984; Syme 1986). The greater attention given to social factors has been due largely to the marked decline in the impact of communicable diseases (particularly in terms of mortality), which resulted from the improvements to the physical environment, in terms of housing, water and food quality, and efficient sewage disposal.

Much of the impetus has come from researchers examining differences in health status between different sub-groups of populations. These aspects are examined in more detail in Chapter 4 (see particularly 'Explanations for health differentials', page 205), so will only be listed here. The elements of the social environment seen as important in health and disease include:

- culture
- gender
- education
- economic factors
- the living environment
- occupation and the working environment
- social networks and social support
- marital status
- life events
- mobility
- psychosocial factors.

Health care

Access to and use of health care services—for prevention, treatment and rehabilitation—are clearly of importance. However, the actual contribution of health services to the public's health is not clear, largely due to the lack of data on appropriate measures of health outcomes.

The continued reliance on measures of mortality (partly because of the lack of other more suitable measures) does not permit a real assessment of the contribution of health services to the public's health. The relationship between declining death rates and use of health services is tenuous, and the main determinants of a country's death rates are the lifestyles and living conditions of its people (AIH 1990). An analysis of the causal factors related to the 10 leading causes of death in the United States attributed 50 per cent of premature mortality to unhealthy behaviour and lifestyles, 20 per cent to human biology, 20 per cent to the physical environment and 10 per cent to inadequate health care (Centers for Disease Control 1977).

Since much of the work of health services in countries like the United States and Australia is directed more to care than to life-saving, this finding is not surprising. As noted in *Australia's health 1990* (AIH 1990), relationships between health services and morbidity, disability and measures of wellbeing are more likely to be demonstrable, but statistics are limited. Development of measures such as quality adjusted life years (QALYs) and disability free years will meet some of the gap between available statistics and the need for improved descriptions of various aspects of the nation's health. For cancer, for example, available information on death rates could be supplemented by data on life years gained through intervention, the quality of those years, and the cost of obtaining them. It is likely that such measures will more accurately reflect the impact of health care services on the population's health.

The health of individuals within society

As noted above, the main criticism of the Lalonde Report's health field concept was that it paid insufficient attention to the environment, particularly aspects of the social environment (Buck 1985). As such, it focused more on disease than on health, and on individuals rather than on individuals as members of society.

In contrast, much of the recent work in Europe has focused on population-level evidence of differences in health outcomes in seeking an understanding of the determinants of health. For example, the WHO Regional Office for Europe (Whitehead 1990) identified seven main determinants of health differences:

1. Natural, biological variation.
2. Health-damaging behaviour if freely chosen (such as participation in hazardous sports and pastimes).
3. The transient health advantage of one group over another when that group is the first to adopt a health-promoting behaviour (as long as other groups have the means to catch up fairly soon).
4. Health-damaging behaviour where the degree of choice of lifestyles is severely limited.
5. Exposure to unhealthy, stressful, living and working conditions.
6. Inadequate access to essential health and other public services.
7. Health-related social mobility.

Other recent examinations of the causes of health status differences between sub-groups of populations have largely followed the more general approach taken by the British Working Group on Inequalities in Health, which considered four categories of explanations for differences according to social class (based on occupation): artefact, selection, behavioural patterns and material/structural circumstances (Townsend, Davidson 1982).

The artefact explanation suggests that documented health differentials are a result of the way the research has been conducted—'both health and class are artificial variables thrown up by attempts to measure social phenomena and ... the relationship between them may itself be an artefact of little causal significance' (Townsend, Davidson 1982:113). The effect of such artefacts is not, however, believed to be substantial (Power, Manor, Fox 1991).

According to the selection explanation, health differences reflect the process of social mobility, with fitter and healthier individuals moving to higher 'class' occupations and less healthy individuals moving to lower class occupations. In Britain, there is evidence that this does occur (Illsley, Baker 1991), but, again, selection is 'unlikely to be a sufficient explanation' for the documented differences in health (Power, Manor, Fox 1991).

Behavioural explanations 'focus on the individual ... emphasising unthinking, reckless or irresponsible behaviour or incautious lifestyle as the moving determinant of poor health status' (Townsend, Davidson 1982:119), whereas materialist/structural explanations 'locate the responsibility for inequalities in health in the social structure governing the distribution of resources towards different groups of people' (Power, Manor, Fox 1991:22).

The British Working Group on Inequalities in Health recognised 'the multi-causal nature of health inequalities' and that there was not 'any single and *simple explanation* of the complex data' it had assembled (Townsend, Davidson 1982). While recognising the interrelationship of behavioural and materialist/structural explanations, the Group stressed 'the importance of material conditions in life' in its wide-ranging policy recommendations (Townsend, Davidson 1982:207). In this regard, it was recognising the inequity of those health status differences over which individuals and sectors of society have, at most, limited control.

Summary

Both individual and societal factors are important in determining health outcomes. The relative contributions of the various factors are not entirely clear, but as noted above, recent work in Europe has placed greater emphasis on the relationship between individual circumstances and social structures.

This increasing emphasis has resulted largely from the identification of consistent health differentials between sub-groups of populations, as are documented in Chapter 4 of this report for various sub-groups of the Australian population. As well as reviewing the evidence for health differentials in Australia, Chapter 4 examines in more detail some of the factors summarised here as possibly underlying these differences in health outcomes.

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2 The health of Australians

2.1 Health indicators

Assessment of the health of populations is determined by the data available, and for countries like Australia with reasonable indicators of health status, the best developed data are those relating to death and the causes of death. As a result, most international comparisons of health status still rely on measures such as death rates (including cause-specific rates), expectation of life, and infant and perinatal mortality rates (see Box 2.1).

The next major set of indicators is derived from systems for treating illness—that is, health services information. As hospital services developed, efforts were made to record the causes of admissions to hospitals and what happened to people in hospital. Comparisons of admissions for different causes are used as indicators of health, but they are actually measuring illness. There are many shortcomings in using data from hospital admissions—sick people who do not have access to hospitals are not counted and people who are repeatedly admitted are counted each time. Admissions may be influenced also by the level and type of hospital provision and by medical practice, itself subject to fashion. However, despite their limitations, data on sickness and disease derived from hospital admissions give some insights into illness in the community.

The use of death statistics and data from health services as indicators of health status was possible because the data were being produced for other specific purposes.

Box 2.1: International comparisons

Comparisons are presented in this report between Australia and a number of countries selected either because of their historic ties to Australia or their position as world leaders in health. They include:

- *countries providing significant sources of migrants to Australia (for which data are available)*
- *countries with a life expectancy of either sex at birth in 1990 (or earlier year for which data are available) greater than that of the same sex in Australia in 1990.*

Almost all of the countries are developed industrial economies. Data are not available for some other countries, such as Vietnam, which have been significant sources of migration to Australia.

For the charts in which values of a health status indicator are shown for males and females separately, countries are ranked in order of male values.

The development of population surveys has increased the information available about the health of the whole population, including those who have not entered hospitals or used health services. As well, surveys have allowed social and economic factors about individuals to be associated with measures of health status and risk factors. They have also allowed information to be collected about disabilities and handicaps, an area for which data have been particularly difficult to collect. However, most major health surveys rely on individuals reporting on their own health problems, which can introduce the possibility of bias.

Disease registers, such as the cancer registries, are a potentially valuable source of information about major health conditions. Since 1972, State and Territory-based cancer registries have collected information about new cases of cancer as well as collated information about deaths from cancer. Comprehensive national data are available from 1982.

The sections of this chapter, and Chapter 4, draw on these types of health data sources, and some sections contain discussion about the actual sources used. 'Health statistics: sources, developments and deficiencies' (page 259) provides a detailed outline of health statistics in Australia.

2.2 Mortality

Trends in death rates

Australia's death rates for 1990 continued the steady decline that has been occurring since the early 1970s, and add to the substantial reductions that have occurred in the twentieth century (see Box 2.2). Details of these changes have been presented in a recent Institute publication *Trends in Australian mortality 1921–1988* (d'Espaignet et al. 1991), which forms the basis of much of the material presented here.

Box 2.2: Comparing death rates

Statistics relating to deaths are sometimes presented as crude death rates (the numbers of deaths in a period divided by the numbers in the relevant population or population sub-group). For example, the 1990 Australian crude death rates were 7.6 per 1,000 males and 6.5 per 1,000 females. Since the risk of dying is very different at different ages, crude death rates may change over time because of changes in the age distribution of the population, even if death rates at particular ages (age-specific death rates) remain constant.

Age-standardised death rates are summary measures which allow comparison between populations with different age distributions, whether the same population over time or different populations at the same time.

For comparisons of Australian death rates over time, rates for males and females have been standardised to the total Australian population as at 30 June 1988 (ABS 1989). The WHO European standard population has been used for computing age- standardised rates for international comparisons (WHO 1992).

Between 1921 and 1990, the age-standardised death rate for men almost halved from 1,689 to 885 deaths per 100,000 per year (Figure 2.1; see also Table S14, page 308). Death rates for women declined even more, from 1,356 to 532 deaths per 100,000 per year. As a result, the male to female ratio of mortality has increased from 1.25 to 1.66.

Between 1921 and 1950, female death rates declined by about 1.0 per cent per year, and male rates by about 0.6 per cent per year. However, between 1950 and 1970, male death rates fluctuated around the level for 1950 and the decline in female rates slowed slightly, to less than 0.8 per cent per year. Since then, the decline in male and female death rates has increased markedly, with male rates declining by 2.4 per cent per year between 1970 and 1990, and female rates by 2.5 per cent per year.

During the first half of the century, the declines in death rates were largely due to reduced mortality from communicable diseases for all age groups, but particularly for infants and young children. At the same time, mortality from disease of the circulatory system (even then the leading cause of death) was rising steadily, for both sexes. The following phase in death rates, from 1950 to 1970, reflects the peak in death rates from disease of the circulatory system, in the 1950s for females and the late 1960s for males (Figure 2.1). Continuing substantial declines in mortality from these diseases are largely responsible for the impressive reductions in death rates since 1970.

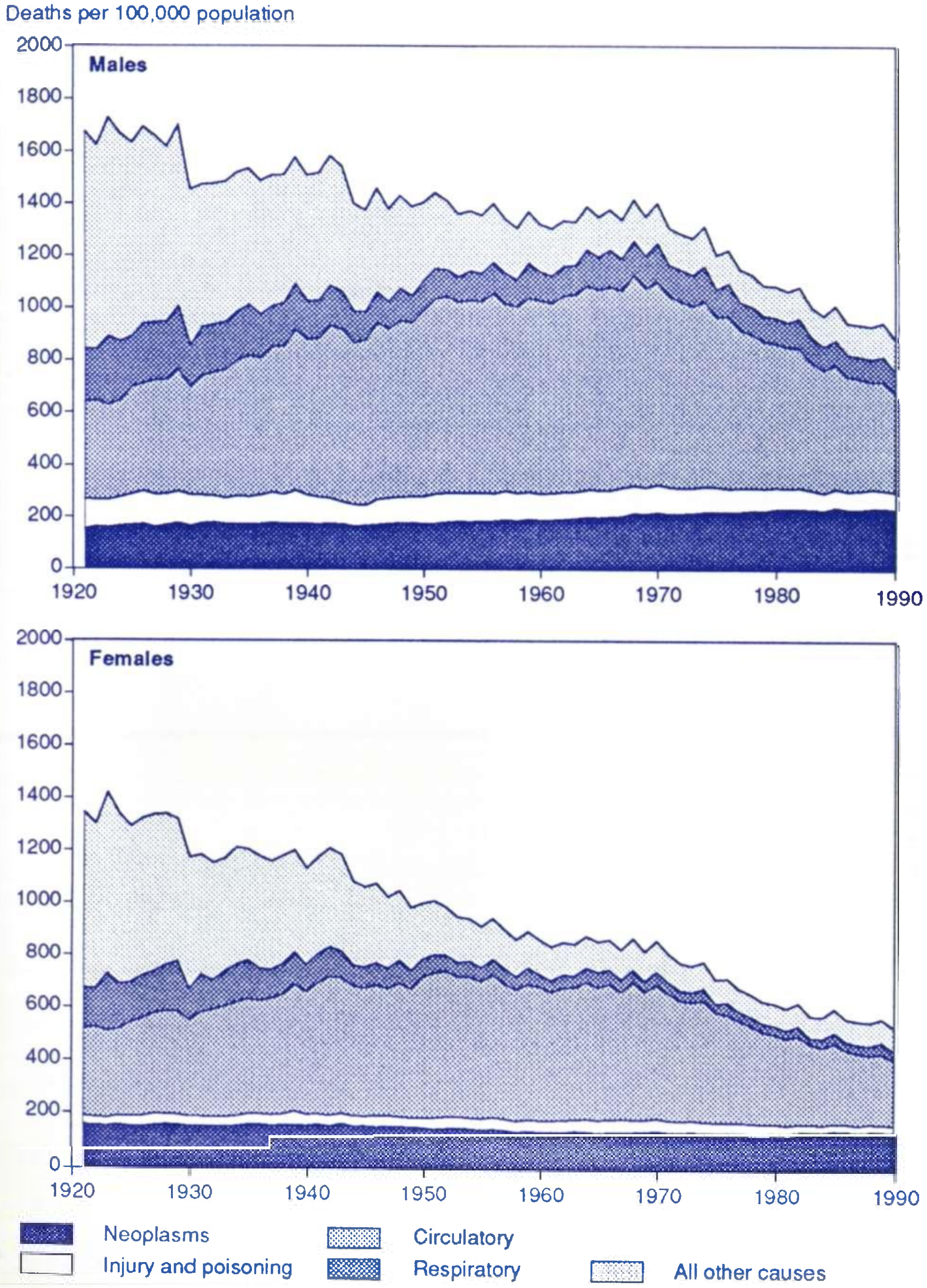
Between 1921 and 1990, death rates declined for all age groups, for both males and females (Figures 2.2 and 2.3). As noted above, by far the greatest relative reductions in death rates were for infants and children (see 'Infant and perinatal mortality', page 34, for details of the trends in infant mortality). For male adults up to age 49 years, there was a steady decline in death rates over the entire period, with a slight acceleration since the early 1970s for men aged 40 to 49 years. In very recent years, there has been a slight upturn in death rates for men aged 25 to 39 years, largely due to deaths from AIDS. For men aged 50 years or older, the much smaller relative declines in death rates have, for most age groups, occurred only since the early 1970s. Between 1921 and 1990, death rates declined for females in all age groups. Unlike death rates for older men, death rates for older women declined over the entire period, although the decline has been more rapid since the early 1970s.

The recent reductions in death rates for older men and women represent a marked change in the overall pattern of mortality decline, and are reflected in increases in life expectancy at older ages (see 'Life expectancy', page 27).

In recent years, there have been substantial differences in death rates between the Australian States and Territories (ABS 3303.0; see also Table S15, page 309). Overall, the Australian Capital Territory and Western Australia have had the lowest standardised rates, and the Northern Territory the highest, for both males and females. Tasmania has had higher death rates than the other States, for both males and females, and rates for New South Wales have also been high.

The much higher death rates for the Northern Territory than for the States and the Australian Capital Territory reflect mainly the much higher mortality of Aboriginal people (see Section 4.2, page 210), who comprise some 22 per cent of the total population in the Northern Territory. The reasons, however, for the higher death rates for Tasmania and New South Wales, and the lower rates for Western Australia and the Australian Capital Territory, are not clear.

Figure 2.1: Major causes of death, age-standardised rates by sex, 1921 to 1990

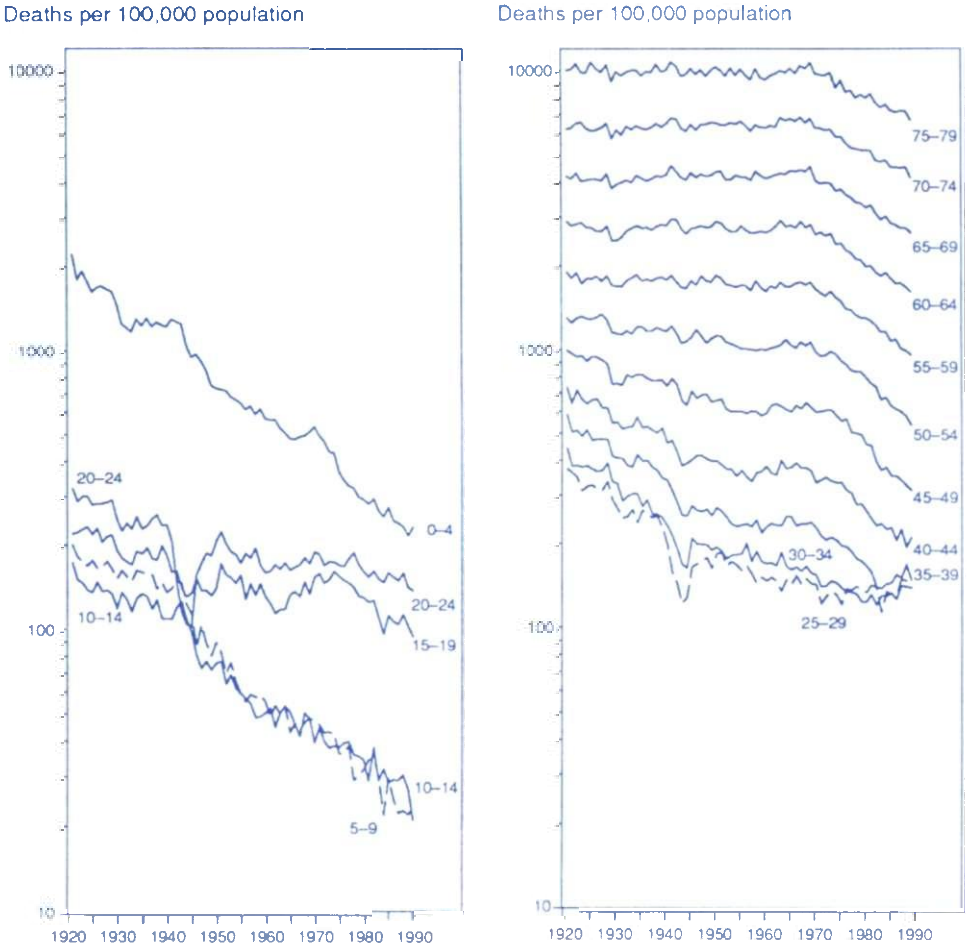


Source: Australian Institute of Health and Welfare; d'Espaignet et al. 1991

Australian death rates are comparable with those for Canada, Spain and Sweden, lower than those for New Zealand, the United Kingdom and the United States, but much higher than those for Japan (for both males and females) and Iceland (for males) (Tables S20, page 316 and S21, page 317).

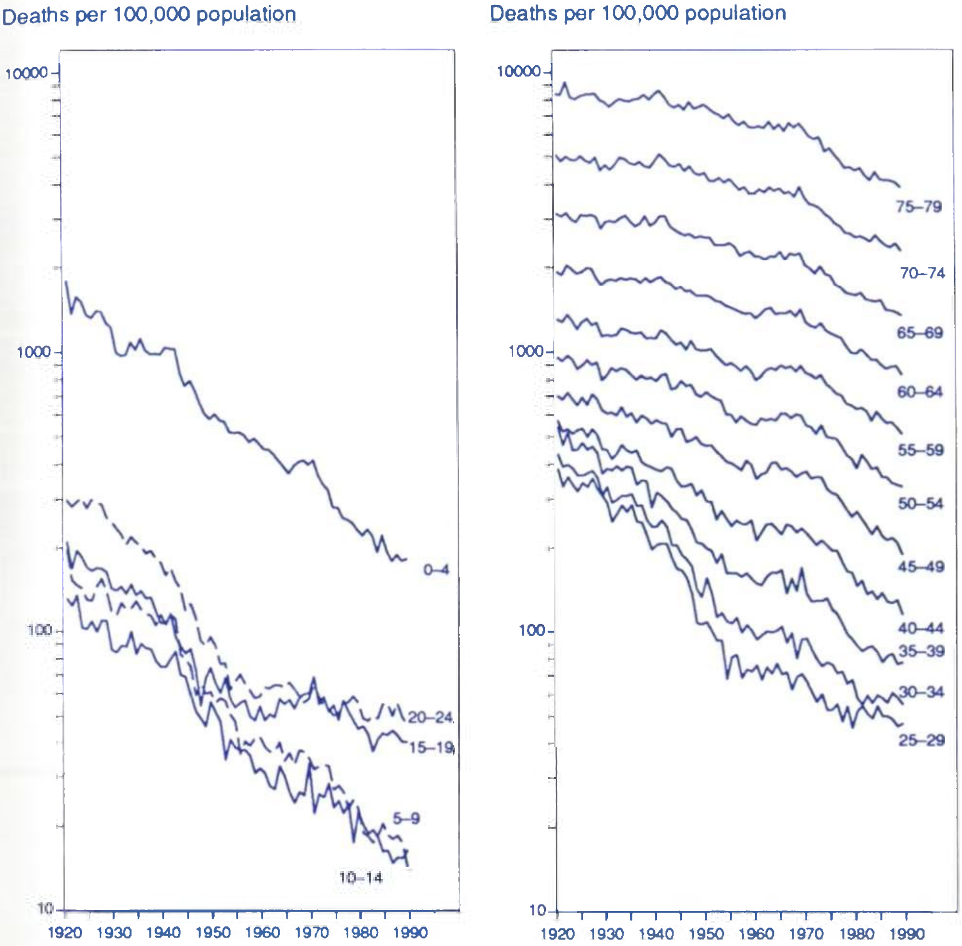
Further aspects of death rates are examined in Chapter 4 on health differentials.

Figure 2.2: Age-specific death rates, all causes, males, 1921 to 1990



Source: Australian Institute of Health and Welfare; d'Espaignet et al. 1991

Figure 2.3: Age-specific death rates, all causes, females, 1921 to 1990



Source: Australian Institute of Health and Welfare; d'Espaignet et al. 1991

Life expectancy

The continuing reductions in death rates are reflected in further improvements in life expectancy (see Box 2.3). An Australian male born in 1990 could expect to live 73.9 years, and a female could expect to live 80.0 years (ABS 1991c). Both these figures are greater than they have been at any time in the past, and continue the gradual improvement in life expectancy that has occurred over the past 20 years.

These increases in life expectancy are part of the substantial improvements that have occurred in Australia during the twentieth century. Between 1901–1910 and 1990, life expectancy at birth increased by almost 19 years for males and by more than 21 years for females (see Table S12, page 306). During the first half of the century, the major contributions to increased life expectancy were the decreasing death rates for infants, children and young adults (see 'Trends in death rates', page 23, and 'Infant and perinatal mortality', page 34). Since the early 1970s, improvements in life expectancy have been achieved by reductions in death rates for all ages, but particularly for people aged 45 years and over.

The changed relative importance of death rates for particular age groups is reflected in the changes to life expectancy at older ages. Between 1901–1910 and 1970–1972, life expectancy at age 65 years increased by 1.1 years for males and 3.2 years for females. Since 1970–1972, it has increased by 2.8 years for males and 2.9 years for females.

Reflecting the greater overall reductions in death rates for females compared with males, the difference between male and female life expectancy at birth widened from 3.6 years for 1901–1910 to 6.1 years for 1990. Over the last 20 years, the gap widened from 6.7 years in 1970–1972 to 7.1 years in 1980–1982, but then narrowed to the current level. These trends largely reflect the major changes in death rates from disease of the circulatory system. As noted above, the decline in female death rates commenced much earlier than the decline in male rates, and was seen earlier in younger age groups.

Within Australia in 1990, life expectancy at birth for both males and females was highest in Western Australia, and lowest in the Northern Territory (Table S11, page 306). Of the States, life expectancy is lowest in Tasmania, for males and females. For the Northern Territory, life expectancy at birth is much lower than overall Australian levels—7.9 years lower for males and 6.7 years lower for females.

Australian life expectancy at birth is similar to levels in countries such as Italy, Norway, Canada and Spain, and higher than the levels in New Zealand, the United Kingdom and the United States (Figure 2.4). Australian levels are lower than those for Sweden, Switzerland, Greece and, especially, Japan.

Box 2.3: Life expectancy

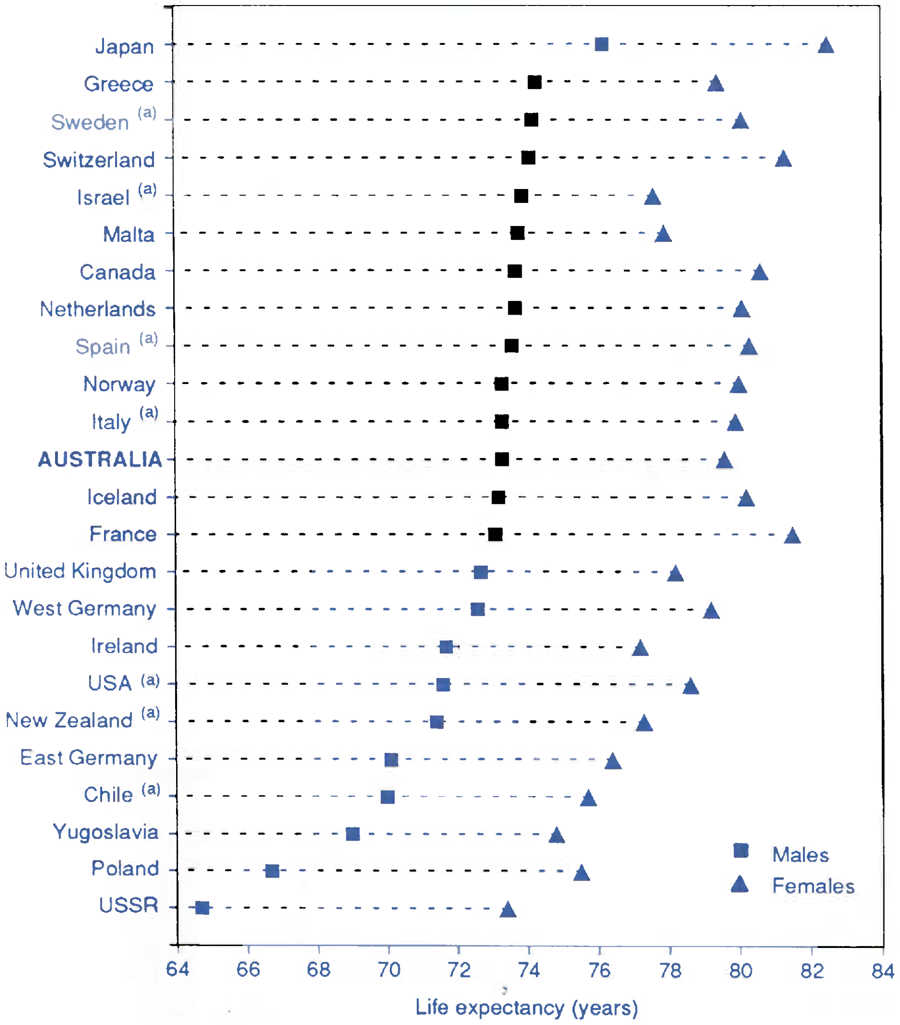
Life expectancy is a statistical measure based on current mortality conditions. It is an estimate of the expected average number of years of life remaining to members of a group if prevailing mortality patterns do not change.

Life expectancy at a particular age takes account only of death rates at that age and higher ages, and is not influenced by death rates at younger ages. It is usually calculated using age-specific death rates for a particular calendar year.

Life expectancies summarise the mortality experience of people born in many different years and are not estimates of the expected length of life of individuals born in a particular year. For example, the life expectancy of Australian females born in 1990 was 80.0 years. This means girls born in 1990 can expect to live, on average, 80.0 years if the death rates at each age in 1990 neither improve nor worsen over their lifetimes. If death rates continue to decrease, then life expectancy will increase.

The purpose of calculating life expectancies is to summarise present mortality experience, not to predict the future lifespan of individuals. Life expectancy is a useful comparative indicator because, as with the age-standardised death rate (Box 2.2), it is unaffected by the age distribution of the population. It also has the advantage of being expressed in years of life, a measure that is meaningful in terms of individual experience.

Figure 2.4: Life expectancy at birth by sex, selected countries, 1989



(a) Israel, Italy, Sweden, USA, USSR 1988; Chile, New Zealand, Spain 1987

Source: World Health Organization 1991, 1992 *Refer to Table S13, page 307*

Major causes of death

Despite the substantial reductions that have occurred over the past few decades in death rates for conditions classified in the ICD category ***Diseases of the circulatory system***, this group (which includes heart disease and stroke) continues to be by far Australia's leading cause of death, for both males and females (Figure 2.1; Table S18, page 314) (ABS 1991b).

In 1990, deaths from these diseases comprised 42 per cent of all male deaths, and 49 per cent of all female deaths. The higher proportion for females is largely a result of much lower numbers of female deaths from other causes.

Throughout the period 1921 to 1990, ***Diseases of the circulatory system*** has been the leading cause of death, for both males and females, but the contribution to total death rates has changed substantially. Between 1921 and the early 1950s, the age-standardised death rate for males increased sharply from 376 to around 700 deaths per 100,000 for males, and from 334 to around 550 per 100,000 for females. During the 1950s and 1960s, male death rates continued to rise slowly to peak at 814 deaths per 100,000 in 1968. In contrast, female death rates declined slowly from the mid-1950s. From the early 1970s, death rates for both males and females declined rapidly to their current levels—383 per 100,000 for males and 248 per 100,000 for females.

Age-specific death rates for ***Diseases of the circulatory system*** show two distinct patterns (Figures 2.5 and 2.6). For younger age groups (males up to age 34 years and females up to 39 years), death rates have declined fairly steadily over the entire period 1921 to 1990. For males aged 35 years or older, death rates increased up to the late 1960s, after which they declined rapidly. For women aged 40 years or older, the increases in death rates were very much less than those experienced by men, but their rates, too, have declined substantially from those of the late 1960s.

In 1990, ***Neoplasms*** (the ICD category for cancers) was responsible for the second highest number of deaths—27 per cent of male deaths and 24 per cent of female deaths.

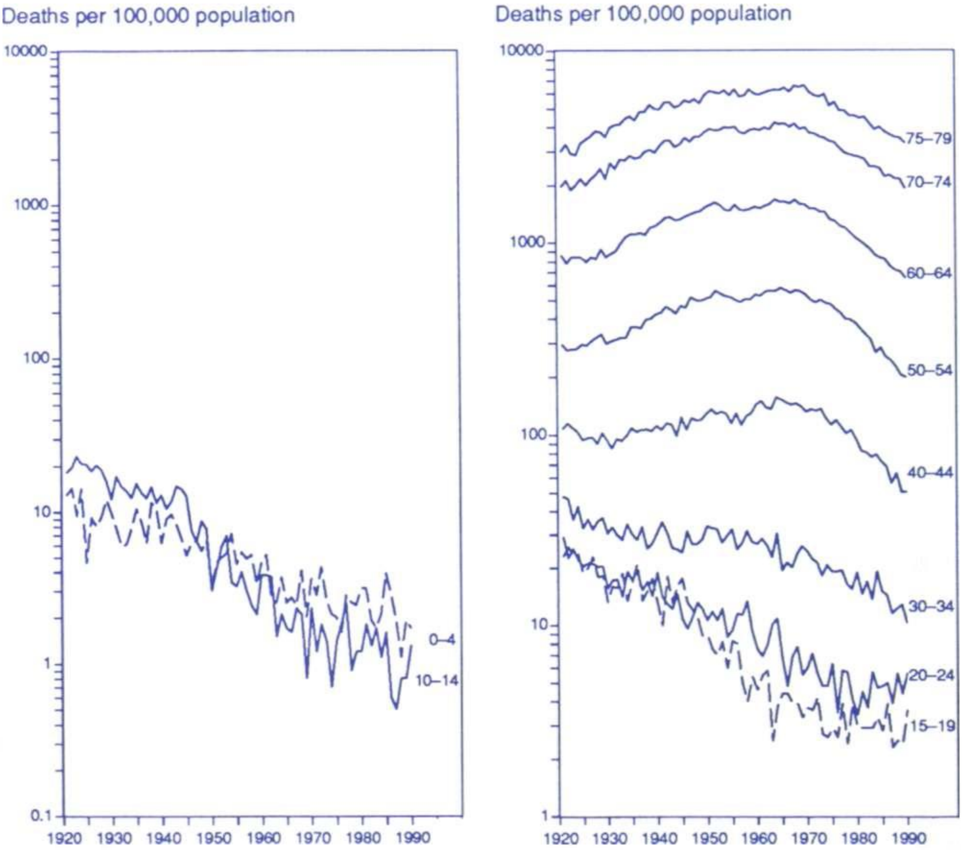
Between 1921 and 1990, standardised male cancer death rates have increased steadily, from 154 to 232 deaths per 100,000, with the average annual increase being slightly higher from the 1940s (Figure 2.1; Table S18, page 314). From 1921 until the late 1940s, female rates were fairly steady at about 155 deaths per 100,000. Rates then declined slightly to around 135 deaths per 100,000 during the 1960s and 1970s, before rising gradually to the current level, 138 per 100,000.

Of course, cancer is not a single disease, but rather a collection of different diseases which have an important common feature—the uncontrolled growth of body cells. As a result, the overall death rates for cancers conceal some important differences (Figure 2.7), with the age-standardised death rates of some cancers (such as lung cancer) having increased markedly, while the rates of others (particularly stomach cancer) have declined.

The large overall increase in male cancer death rates is almost entirely due to lung cancer, which is also the only main cancer showing consistent increases for females, particularly since the 1960s. Until the 1980s, the effect of the increase in female deaths from lung cancer on overall cancer death rates was offset by the decrease in deaths from stomach cancer. Death rates for stomach cancer, formerly the leading cause of cancer deaths, have declined steadily throughout this century, as have death rates for a number of other cancers. Excluding deaths from lung cancer, the overall age-standardised death rates for cancers have declined slowly but steadily since 1921.

The pattern of death rates for lung cancer, of which 78 per cent of male cases and 73 per cent of female cases are attributable to smoking (Holman et al. 1990), is analysed in more detail later (see 'Lung cancer', page 78). Separate sections are also devoted to two important female cancers—breast cancer (page 81) and cervical cancer (page 84).

Figure 2.5: Diseases of the circulatory system, selected age-specific death rates, males, 1921 to 1990



Source: Australian Institute of Health and Welfare; d'Espaignet et al. 1991

After *Diseases of the circulatory system* and *Neoplasms,* conditions classified to the ICD category *Diseases of the respiratory system* are the third most frequent cause of death, responsible in 1990 for 8.5 per cent of male deaths and 6.4 per cent of female deaths.

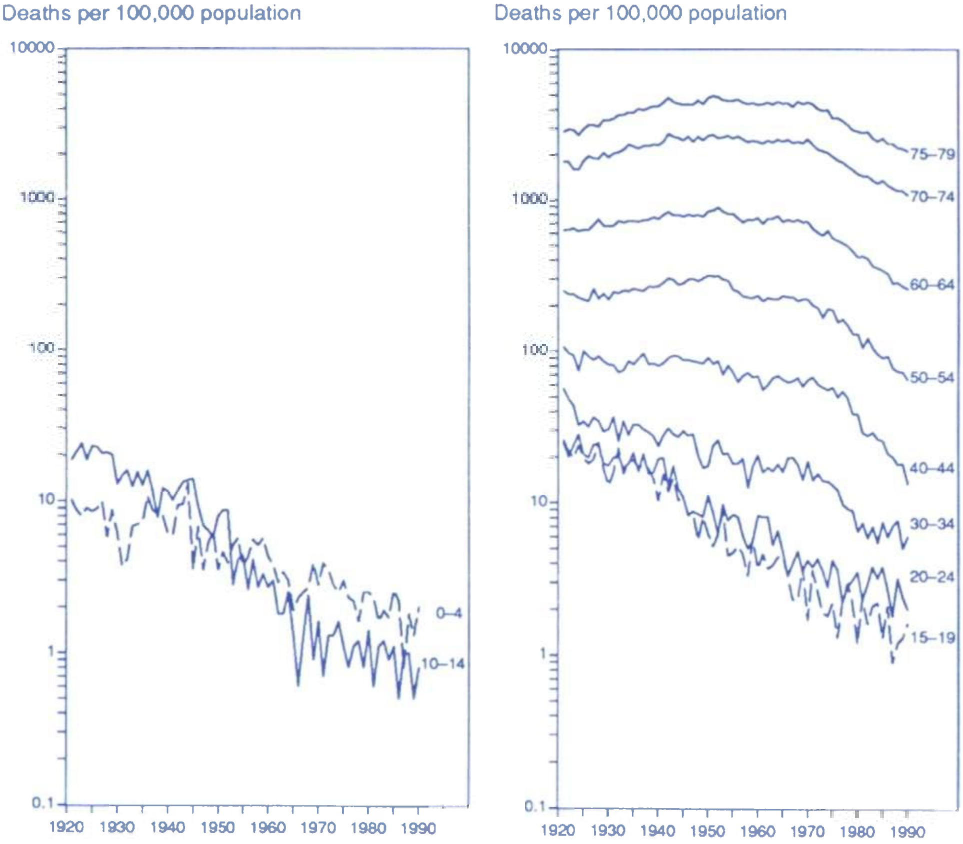
Between 1921 and the late 1950s, the standardised death rate for males decreased steadily, from 201 to just over 100 deaths per 100,000, but then rose slightly until the mid-1970s (Figure 3.1; Table S18, page 314). Since then, the rate has declined to 79 deaths per 100,000 in 1990. Although the standardised death rate for females declined fairly steadily between 1921 and 1990, from 155 to 34 deaths per 100,000, most of the decline occurred before 1960.

Death rates for *Diseases of the respiratory system* tend to fluctuate more than rates for other categories, partly because of the epidemic nature of potentially fatal acute respiratory infections, such as influenza. For example, an influenza outbreak in 1989 resulted in higher overall mortality in that year than in 1988 or 1990. The effects of that outbreak were seen in the deaths from disease of the respiratory and circulatory systems, particularly for people aged 80 years or older.

In Australia in 1990, deaths from ***External causes of injury and poisoning*** ranked fourth, accounting for 7,935 deaths—8.6 per cent of male deaths and 4.2 per cent of female deaths. The group accounted for 49 per cent of all deaths for ages 1 to 44 years.

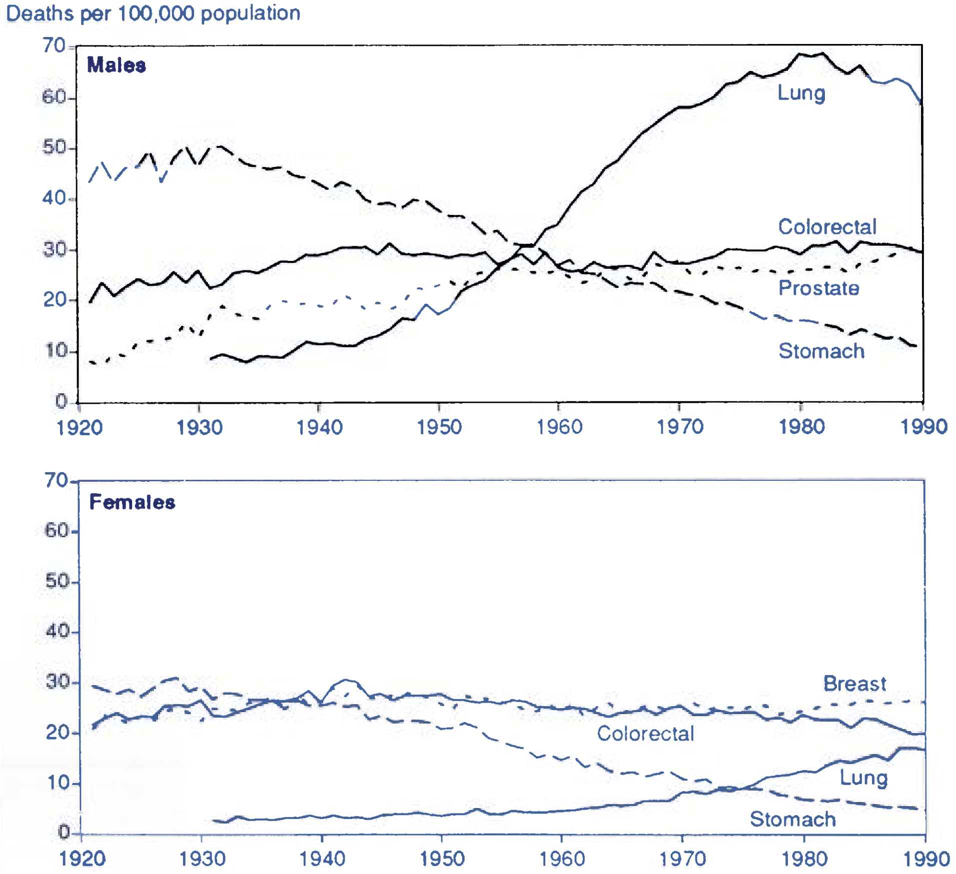
Between 1921 and the early 1970s, the standardised death rate for males remained fairly steady at around 110 deaths per 100,000. Since then, it has declined steadily by more than 2 per cent per annum to 68 deaths per 100,000 in 1990 (Figure 2.1; Table S18, page 314). Death rates for females have always been much less than male rates, but increased slightly from 34 deaths per 100,000 in 1921 to around 50 in 1965–1967. Since that time, they too have declined steadily, by about 3 per cent per annum to 25 deaths per 100,000 in 1990.

Figure 2.6: Diseases of the circulatory system, selected age-specific death rates, females, 1921 to 1990



Source: Australian Institute of Health and Welfare; d'Espaignet et al. 1991

Figure 2.7: Major cancers, age-standardised death rates by sex(a), 1921 to 1990



(a) Standardised to 1988 Australian population. Data for lung cancer not available before 1931.

Source: Australian Institute of Health and Welfare *Refer to Appendix 1, Table A1*

In 1990, the leading causes of fatal injury were motor vehicle traffic accidents, which accounted for 31 per cent of both male and female injury deaths, and suicide, which accounted for 31 per cent of male injury deaths and 18 per cent of female injury deaths (Table 2.1).

The most dramatic change in recent years in mortality from ***External causes of injury and poisoning*** is the decline in road deaths. Of deaths registered in 1990, 2,489 were attributed to motor vehicle traffic accidents—the lowest number for several decades, and 12 per cent less than the number in 1989. Separate data compiled by the Federal Office of Road Safety (1992) on deaths occurring in 1991 show that the decline has continued.

Between 1960 and the late 1970s, the annual road accident fatality rate fluctuated around 25 deaths per 100,000, but has since declined by 5 per cent per year to 13.6 deaths per 100,000 in 1990 (Federal Office of Road Safety 1991b). In terms of vehicle distance travelled, the decline between 1980 and 1990 was slightly more—by 6 per cent per annum to 1.6 deaths per 100 million vehicle kilometres travelled in 1990.

Suicide accounted for 1,735 male deaths and 426 female deaths in 1990. The crude rate of male deaths attributed to suicide has been fairly steady in the most recent years, after a sharp increase in the mid-1980s to a peak in 1987. The rate for females has declined slightly, also since 1987. Continuing the pattern that emerged for males during the early 1980s, suicide rates were high for all age groups from 15 years, though a little lower for middle aged men than for young and older men. The pattern for females is different, generally rising with age. A long-term decline in female suicide rates in the mid-adult years continued in 1990.

Table 2.1: Deaths from external causes of injury[(a)] by sex, 1990

	Males		*Females*	
Cause of death	*Number*	*(b)Rate*	*Number*	*(b)Rate*
Motor vehicle traffic accidents	1,751	21	738	9
Suicide	1,735	20	426	5
Accidental fall	472	6	558	7
Homicide	239	3	146	2
Accidental drowning	227	3	73	1
Other causes	1,164	14	406	5
All external causes	**5,588**	**68**	**2,347**	**25**

(a) Selected causes from the ICD-9 group 'External causes of injury and poisoning'.

(b) Rate per 100,000 population. Crude rates for individual causes and standardised rates for 'All external causes'.

Source: AIHW National Injury Surveillance Unit, derived from ABS 1991b

Infant and perinatal mortality

The two key mortality indicators from around the time of birth until the end of the first year of life are the *infant mortality rate* and the *perinatal mortality rate* (The definitions of these are quite complex—see Box 2.4). For each of these indicators, Australia has very low rates by international standards. However, rates in some countries are even lower, suggesting that there is still room for improvement in the survival of Australian babies.

Infant mortality

For Australia in 1990, the infant mortality rate was 8.2 infant deaths per 1,000 live births, much lower than the rate for 1921–1925, which was 57.9. For males, the rate declined from 64.2 per 1,000 in 1921–1925 to 9.1 in 1990 (Figure 2.8). The decline for females is of a similar magnitude, from 51.2 per 1,000 in 1921–1925 to 7.2 in 1990. The difference between the male and female infant mortality rates has narrowed appreciably, but the ratio of the rates has remained remarkably constant around 1.3.

The major difference between the States and Territories in infant mortality rates is the much higher rate for the Northern Territory—16.3 infant deaths per 1,000 live births in 1988–1990 (see also Table S22, page 318). The Northern Territory level is due largely to the much higher rate for Aborigines (see Section 4.2, page 210), who make up a much larger proportion of the population in the Northern Territory than they do elsewhere in Australia. During the 1980s, the infant mortality rate for Tasmania was consistently higher than the rates for the other States and the Australian Capital Territory. In 1988–1990, the rate for Tasmania was 9.7 per 1,000, while Victoria had the lowest rate, 7.4 per 1,000, and South Australia the second lowest rate, 8.0.

Box 2.4: Infant and perinatal mortality

The infant mortality rate (IMR) is used internationally as one of the key indicators of a community's health. It is a measure of the yearly rate of death of children less than one year of age (infants). The IMR is defined as the number of infant deaths for every 1,000 live births.

The other key indicator is the perinatal mortality rate, which is a measure of deaths in the late stages of pregnancy (fetal deaths) and in early life (neonatal deaths). Despite efforts over a number of years, there are no universally accepted definitions for the two components of perinatal deaths.

In official Australia-wide collections by ABS, a fetal death (or stillbirth) is defined as the death of a fetus weighing at least 500 grams (or if birthweight is unknown, of at least 22 weeks gestation) which shows no signs of life after delivery. In the context of perinatal deaths, neonatal deaths are defined as deaths of liveborn infants (weighing at least 500 grams or, if birthweight is unknown, of at least 22 weeks gestation) occurring within 28 days of birth. The perinatal mortality rate is the number of perinatal deaths (fetal plus neonatal deaths) per 1,000 total births (fetal deaths plus live births). It should be noted that these definitions used by ABS differ slightly from the legal definitions used by each State and Territory, and from the definitions used generally by other countries.

Within Australia, another complicating feature is that the definition used by the ABS of a neonatal death differs according to whether the death is being counted as an infant or perinatal death. In the context of infant deaths, a neonatal death is the death of a liveborn infant, itself defined as 'a child, irrespective of the duration of pregnancy, who after being born breathes or shows any other evidence of life such as heart-beat' (ABS 1991a: 17). According to this definition, births of less than 500 grams are not excluded from the numbers of live births and of neonatal deaths. As a result there are two different counts of neonatal deaths. In the context of infant deaths, there were 1,275 neonatal deaths in Australia in 1990, 153 more than the 1,122 counted in the context of perinatal deaths.

Internationally, the Australian infant mortality rate is among the lowest, being comparable with rates for the United Kingdom and Norway, and lower than those for New Zealand, Italy, Spain and the United States (Table S23, page 318).

The Australian rate is higher than rates in Japan (particularly), Iceland, Sweden, the Netherlands and Canada. The very low rate documented for Japan in 1989—4.6 infant deaths per 1,000 live births—suggests that significant further reductions in the Australian rate are achievable.

Further analysis of differences in infant mortality rates requires an examination of deaths in two time periods within the first year of life: the first four weeks of life (neonatal period) and the period from 28 days to one year (postneonatal period). In developed countries, most neonatal deaths are now due to conditions originating around the time of birth or to congenital malformations. Postneonatal deaths, on the other hand, are more commonly associated with adverse social and environmental conditions.

Between 1921–1925 and 1986–1990, the relative contributions of neonatal and postneonatal deaths in Australia have changed considerably. In 1921–1925, the neonatal mortality rate of 29.9 deaths per 1,000 live births was virtually the same as the postneonatal mortality rate of 28.0 per 1,000 (Figure 2.9). As social and environmental conditions in Australia improved during the first half of this century, both rates declined, but the postneonatal rate did so much more quickly. In 1946–1950, the neonatal rate of 19.3 per 1,000 was more than twice the postneonatal rate of 7.6 per

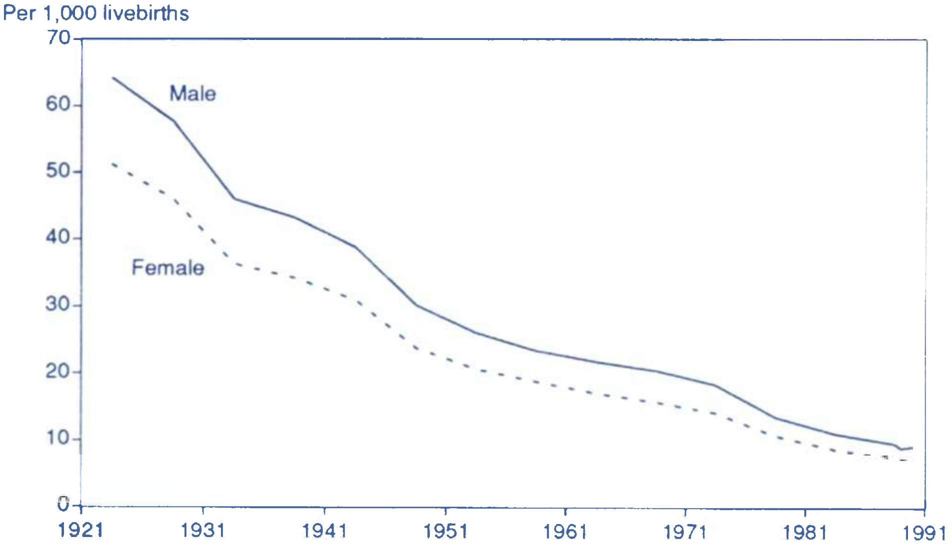
1,000. Particularly since the advent of specialised neonatal care in the late 1960s and early 1970s, the neonatal rate has declined more quickly. In the period 1986–1990, the neonatal rate of 5.1 per 1,000 was 1.5 times the postneonatal rate of 3.4 per 1,000.

On the basis of experience in countries with the lowest infant mortality rates, there is scope in Australia for further reductions in deaths in both the neonatal and postneonatal periods. In the neonatal period, this will require avoidance of preventable deaths caused by conditions originating around the time of birth and those resulting from congenital malformations. In the postneonatal period, deaths attributed to 'ill-defined conditions' account for over half of the deaths. The large majority of these deaths are due to the sudden infant death syndrome (SIDS, also known as cot deaths). Evidence from countries such as Japan, Sweden and Czechoslovakia, where the rate of deaths from SIDS is much less than the Australian rate, suggests that many of these deaths are preventable (Beal, Porter 1991).

Perinatal mortality

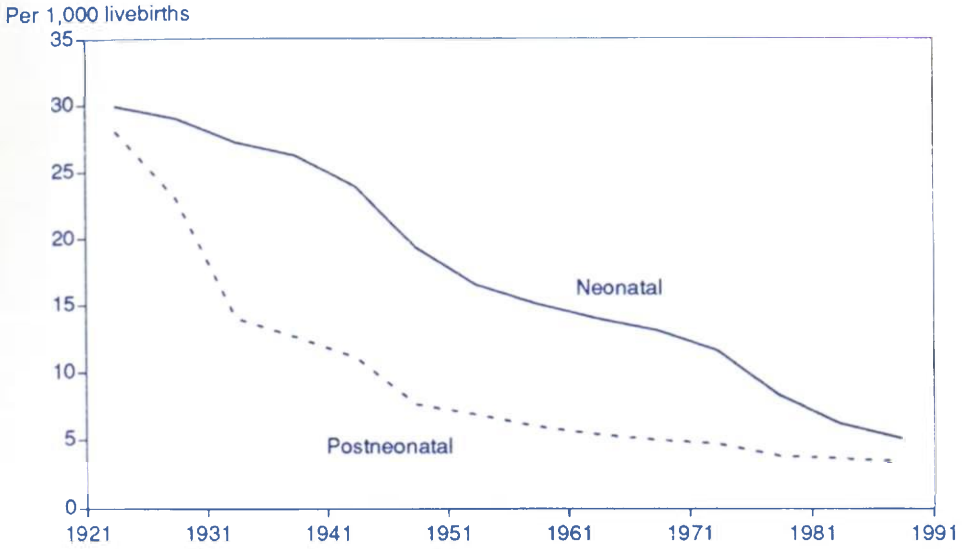
The perinatal mortality rate has more than halved since the early 1970s, declining from 21.7 perinatal deaths per 1,000 total births (live births plus fetal deaths) in 1973 to 10.3 per 1,000 in 1990 (Figure 2.10). (See Box 2.4, particularly the comment on numbers of neonatal deaths.) The annual rate of decline was slower in the 1980s than in the earlier period. Between 1981 and 1990, the average annual decline was 2.9 per cent, compared with 6.3 per cent between 1973 and 1981. The decline in neonatal deaths between 1973 and 1990 (from 11.3 to 4.3 neonatal deaths per 1,000 live births—an average annual rate of 5.8 per cent) was greater than the decline in fetal deaths (from 10.5 to 6.0 fetal deaths per 1,000 total births—3.3 per cent per year).

Figure 2.8: Infant mortality rates by sex, 1921 to 1990



Source: State/Territory Registrars of Births, Deaths and Marriages *Refer to Appendix 1, Table A3*

Figure 2.9: **Neonatal and postneonatal mortality rates, 1921–1925 to 1986–1990**



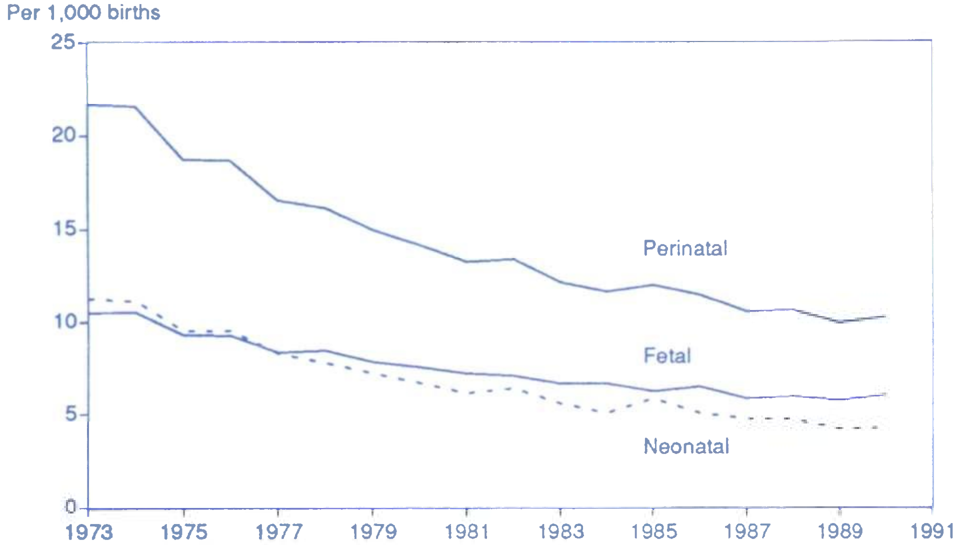
Source: State/Territory Registrars of Births, Deaths and Marriages *Refer to Appendix 1, Table A2*

As was the case for infant mortality, the Northern Territory has relatively high perinatal mortality rates compared with the States and the Australian Capital Territory. Again, the proportionally larger Aboriginal population in the Northern Territory contributes most to the Territory's high rates, which were much higher than national levels throughout the 1980s (Table S23, page 318; see also Section 4.2, page 210). For 1988–1990, the Northern Territory perinatal mortality rate of 19.3 per 1,000 was 1.9 times the national rate of 10.3 per 1,000. During the 1980s, the rates for New South Wales and Tasmania tended to be above the national rate, and those for Western Australia (particularly), South Australia and the Australian Capital Territory below (Table S23, page 318). For 1988–1990, the lowest perinatal mortality rates were in Western Australia (9.1 per 1,000), Queensland (9.8) and Victoria (10.0).

There is a characteristic pattern of perinatal deaths associated with maternal age, with higher mortality rates towards each end of the reproductive years. In 1987–1989, this variation was more pronounced for fetal deaths than for neonatal deaths (Table 2.2). The rate of fetal deaths was 2.3 times higher for mothers aged 40 years and over than for mothers in the 25 to 29 year age group. The corresponding rate ratio for neonatal deaths was 1.4. For teenage mothers, the rate of fetal deaths was 1.6 times higher and the neonatal rate 1.5 times higher than those for 25- to 29-year old mothers.

Deaths occurring in the neonatal period may be further subdivided into three main groups according to the age at which death occurred: the first 24 hours of life, from 1 to 6 days, and from 7 to 27 days. Between 1973 and 1990, the overall decline from 11.3 to 4.3 deaths per 1,000 births largely reflects the substantial falls in deaths on the first day and in the period 1 to 6 days, with relatively little reduction in deaths occurring in the period 7 to 27 days (Figure 2.11).

Figure 2.10: Fetal, neonatal and perinatal mortality rates[(a)], 1973 to 1990



(a) For the fetal and perinatal rates, the denominator is total births (fetal deaths plus live births); for the neonatal rate it is live births.

Source: AIHW National Perinatal Statistics Unit, derived from ABS 3304.0

Refer to Appendix 1, Table A4

The majority of perinatal deaths involve fetuses and infants of low birthweight (less that 2,500 g). In 1990, 69 per cent of perinatal deaths with known birthweights were of fetuses or infants weighing less than 2,500 g. Between 1973 and 1990, more of the decline in perinatal mortality rates was attributable to reductions in deaths of fetuses and infants weighing 1,000–2,499 g than to deaths of fetuses and infants of other weights (Figure 2.12).

Table 2.2: Fetal, neonatal and perinatal deaths[(a)] by maternal age, 1987 to 1989

	Fetal			*Neonatal*			*Perinatal*		
Maternal age group (years)	*Number*	*Rate* [(b)]	*Rate ratio*[(c)]	*Number*	*Rate* [(b)]	*Rate ratio*[(c)]	*Number*	*Rate* [(b)]	*Rate ratio*[(c)]
Less than 20	336	7.9	1.6	256	6.1	1.5	592	13.9	1.5
20 to 24	976	6.1	1.2	723	4.5	1.1	1,699	10.5	1.2
25 to 29	1,430	5.0	1.0	1,144	4.0	1.0	2,574	9.0	1.0
30 to 34	1,052	5.6	1.1	778	4.2	1.1	1,830	9.8	1.1
35 to 39	422	7.2	1.4	281	4.8	1.2	703	12.0	1.3
40 and over	100	11.6	2.3	49	5.8	1.4	149	17.3	1.9
All ages[(d)]	**4,356**	**5.9**		**3,381**	**4.6**		**7,737**	**10.4**	

(a) Includes live births and fetal deaths (stillbirths) with known birthweight of at least 500g.

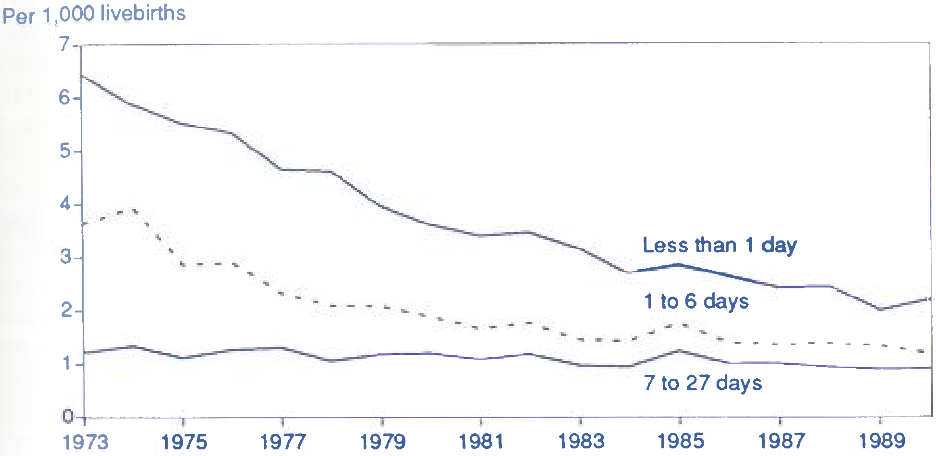
(b) For the fetal and perinatal rates, the denominator is total births (fetal deaths plus live births); for the neonatal rate it is live births.

(c) The ratio of the rate of each group to that of the group with the lowest rate—mothers aged 25 to 29 years.

(d) Includes unstated maternal age.

Source: AIHW National Perinatal Statistics Unit, derived from ABS 3304.0

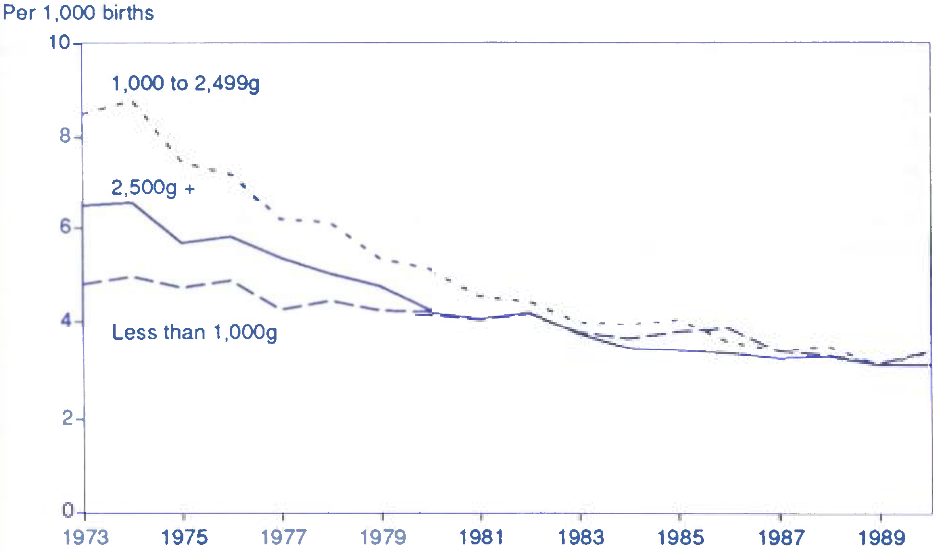
Figure 2.11: Neonatal mortality rate by age at death, 1973 to 1990



Source: AIHW National Perinatal Statistics Unit
derived from ABS 3304.0

Refer to Appendix 1, Table A5

Figure 2.12: Proportionate perinatal mortality rates[(a)], selected birthweights[(b)], 1973 to 1990



(a) In the absence of national birthweight-specific rates for the whole period, these rates show deaths by birthweight per 1,000 total births (fetal deaths plus live births) of all weights.

(b) Excludes perinatal deaths for which birthweight was not known.

Source: AIHW National Perinatal Statistics Unit
derived from ABS 3304.0

Refer to Appendix 1, Table A6

2.3 Sickness and disease

Evidence of morbidity from hospital admissions

An indication of the number and type of serious health problems in Australia is given by the numbers of hospital admissions, the reasons why people are admitted and the length of time they stay there. However, as noted in Section 2.1, it should be borne in mind that hospital admission data have limitations as indicators of morbidity.

Each State and Territory collects information about hospitalisation, and some produce reports containing useful morbidity data. In recent years, there have been encouraging developments towards the standardisation of core data items, and most States and Territories provide data to the Institute for inclusion in national databases. However, of the current data held by the Institute, only those for New South Wales and South Australia provide sufficient details about hospitalisation in public and private hospitals for inclusion in the analysis presented here. The combined data for New South Wales and South Australia for 1988 (which have been standardised using the total 1988 Australian population as the reference population) have been used to provide a picture of hospital morbidity in those two States, but it may well not be representative of the rest of Australia.

Admission rates

In 1988, there was slightly more than one admission for every five people. Standardised admission rates for females were slightly higher than those for males, 238 admissions per 1,000 population compared with 197 per 1,000 (Table 2.3).

Table 2.3: Hospitalisation, admission rates and average length of stay, by sex and ICD-9 chapter, New South Wales and South Australia, 1988(a)

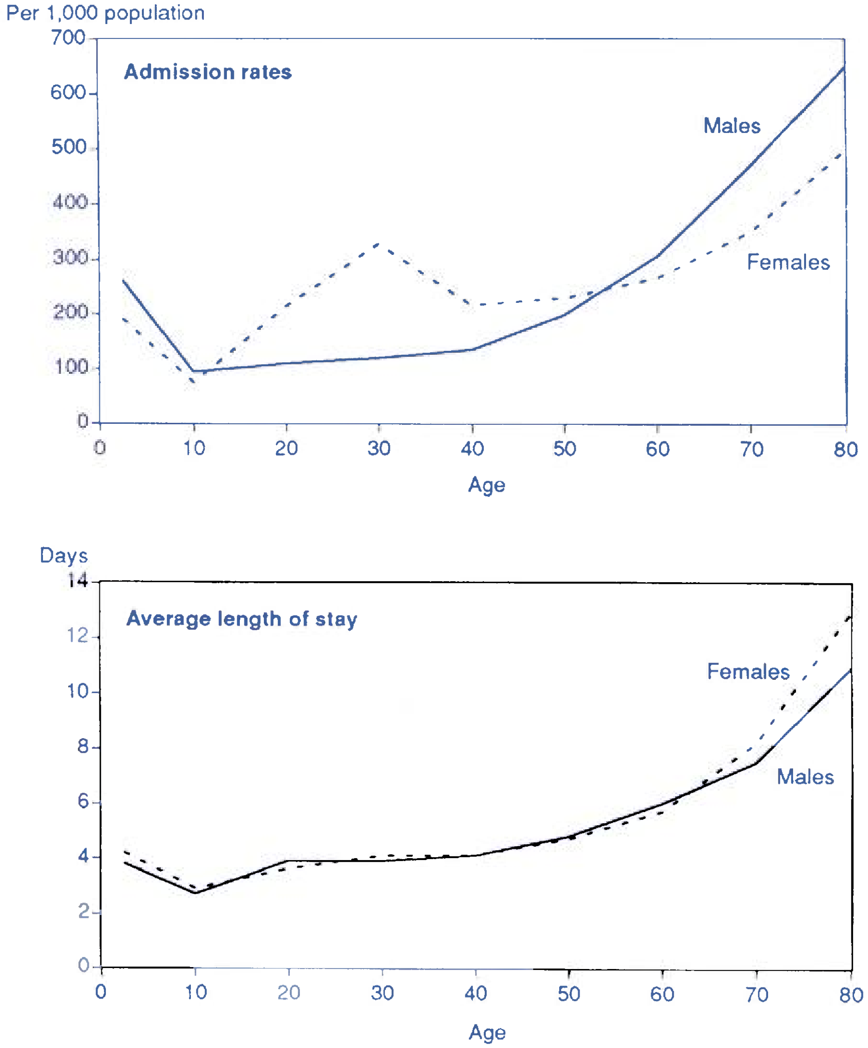
	Admission rate (per 1,000 popn.)			*Average length of stay (days)*		
ICD-9 chapter	*Male*	*Female*	*Persons*	*Male*	*Female*	*Persons*
Infectious and parasitic	3.4	3.6	3.5	5.1	4.0	4.5
Neoplasms	15.1	13.9	14.1	7.9	7.2	7.6
Endocrine, nutritional	2.1	2.7	2.4	9.1	8.1	8.5
Blood diseases	1.8	1.6	1.7	4.3	4.7	4.5
Mental disorders	5.3	5.9	5.6	12.2	14.6	13.5
Nervous system diseases	11.3	11.1	11.2	4.3	4.1	4.2
Circulatory diseases	22.1	14.4	18.0	9.2	9.8	9.4
Respiratory diseases	17.9	14.4	15.9	5.3	4.8	5.0
Digestive diseases	24.7	23.5	24.0	4.4	4.3	4.4
Genitourinary diseases	11.1	27.9	19.1	4.9	3.3	3.7
Complications of pregnancy	na	45.9	na	na	4.7	na
Skin diseases	5.0	4.2	4.6	5.6	6.4	6.0
Musculoskeletal diseases	13.3	12.1	12.8	5.7	7.1	6.4
Congenital anomalies	2.5	1.9	2.2	5.0	5.4	5.1
Perinatal conditions	3.1	2.6	2.9	8.6	8.8	8.7
Ill-defined conditions	12.3	12.8	12.5	3.8	3.6	3.7
Injury and poisoning	23.6	14.9	19.5	5.5	6.9	6.1
Supplementary	22.7	24.4	23.5	3.6	3.6	3.6
All causes	**197.4**	**237.9**	**216.0**	**5.8**	**5.4**	**5.6**

(a) Standardised to the 1988 Australian population.

Source: Australian Institute of Health and Welfare

For both males and females, admission rates were quite high in infancy and the early childhood years (0 to 4 year age group) and lowest for the 5 to 14 year age group (Figure 2.13). Thereafter, overall rates rose with age, the admission rate for people aged 75 years or over being more than four-and-a-half times that for people aged 15 to 24 years.

Figure 2.13: Hospitalisation, admission rates and average length of stay, by age group and sex, NSW and SA, 1988[(a)]



(a) Standardised to the 1988 Australian population.

Source: Australian Institute of Health and Welfare

Refer to Appendix 1, Table A7

The reason for the higher overall admission rate for females than for males was the higher rates for females than males in the young and middle adult years. For these age groups, a substantial number of the admissions for females were pregnancy-related. For the younger and older age groups, age-specific admission rates were higher for males than for females (Figure 2.13).

Causes of hospitalisation

For males, the highest standardised admission rate was for the ICD diagnosis category *Diseases of the digestive system*, followed by conditions classified in the category *Injury and poisoning* (Table 2.3). *Complications of pregnancy, childbirth and the puerperium* was the leading cause of admission for females, followed by *Diseases of the genitourinary system*. For males and females, the third highest rate was for conditions assigned to the ICD *Supplementary classification*, which includes a variety of circumstances other than a disease or injury classifiable to one of the specific ICD categories—for example, special investigations and examinations, uncomplicated childbirth, sterilisation and admission of parents accompanying sick children.

For children up to 14 years of age, *Diseases of the respiratory system* was the leading cause of hospitalisation, followed by *Injury and poisoning* and *Diseases of the digestive system* (Figure 2.14).

For the older age groups (65 to 74 years and 75 years and over), *Diseases of the circulatory system* was the leading cause of hospitalisation for males and females. For older males, *Neoplasms*, *Diseases of the digestive system* and *Diseases of the respiratory system* were also common reasons for hospitalisation. For older females, after *Diseases of the circulatory system*, the next most frequent cause for hospital admission was *Diseases of the digestive system*, followed by *Neoplasms*. For females aged 75 years or over, *Injury and poisoning* (most frequently an injury resulting from a fall) was the third most frequent cause of hospitalisation.

Duration of hospital stay

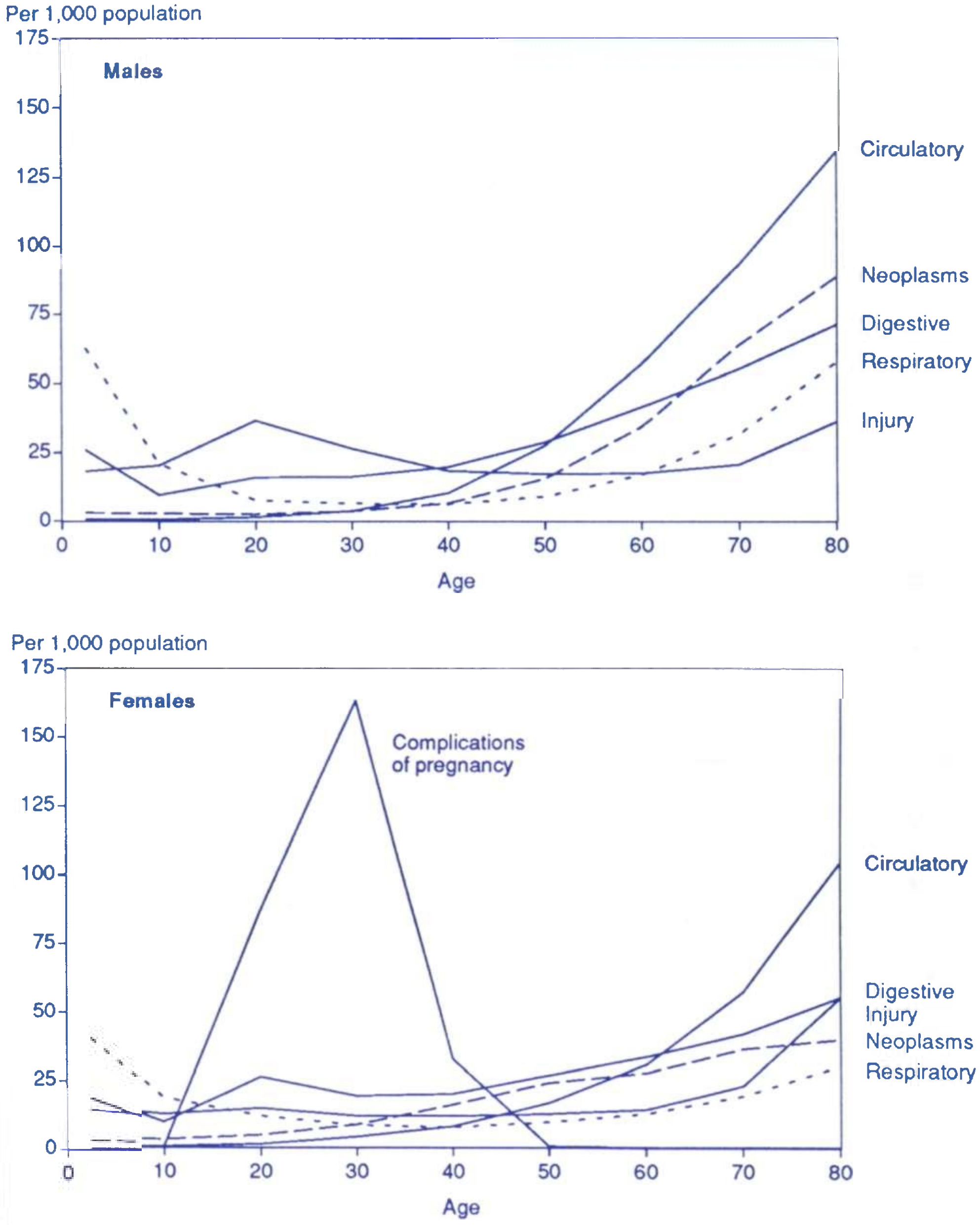
Generally, the average length of time spent in hospital increased with age, for males and females (Figure 2.13). The main exception was for infants and young children (0 to 4 year age group), who stayed slightly longer than older children. Age-specific lengths of stay were similar for males and females, except for the youngest and oldest age groups, where females had slightly longer stays.

For males and females, the average length of hospital stay was longest for *Mental disorders*, followed by *Diseases of the circulatory system* (Table 2.3). Average length of stay was also quite long for *Endocrine, nutritional, metabolic diseases and immunity disorders*, *Certain conditions originating in the perinatal period* and *Neoplasms*.

1989–90 National Health Survey

Earlier parts of this Chapter have presented data derived from records of death and of stays in hospital. These sources relate to the most severe forms of illness, and do not provide information about the very much larger number of episodes of minor and chronic illness that are treated in the community, or for which professional care is never sought. Neither do these sources tell us about the burden of disability and handicap caused by both major and minor illness (information about disability and handicap is summarised in Section 2.4).

Figure 2.14: Hospitalisation, age-specific admission rates by selected ICD-9 chapter and sex, 1988[(a)]

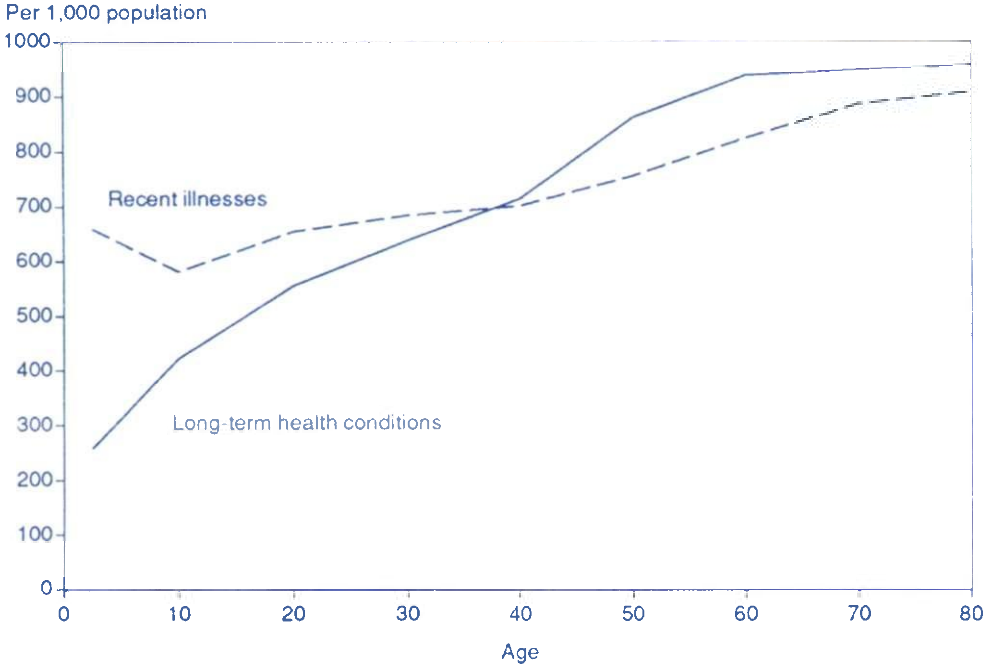


(a) Based on data supplied by NSW and SA, and standardised to the 1988 Australian population.

Source: Australian Institute of Health and Welfare

Refer to Appendix 1, Table A8

Figure 2.15: Persons reporting recent illnesses and long-term health conditions, age-specific rates, 1989–1990



Source: Australian Bureau of Statistics 1992b

Refer to Appendix 1, Table A9

Information about illness in the community can be obtained from population surveys. The most important recent survey of health in Australia took place from October 1989 to September 1990, when the Australian Bureau of Statistics conducted the National Health Survey (1989–90 NHS), the third such survey and the first of what is planned to be a new series of five-yearly surveys (ABS 1991f). In the 1989–90 NHS, information about the health of approximately 54,600 Australians living in a sample of about 22,200 households was collected by interview (see Box 2.7, page 66). Institutionalised people, including hospital inpatients and residents of nursing homes, were excluded from the survey.

Health-related information collected by interview included details of:

- *self-assessed health status*—excellent, good, fair or poor
- *recent illnesses and injuries, and long-term health conditions as a result of illness or injury*
- *reduced activity as a result of illness or injury*—including days off work or away from school
- *health risk factors*—such as smoking, alcohol consumption, diet, participation in exercise and immunisation status
- *actions taken in response to illnesses and conditions*—including hospital episodes, consultations with medical practitioners and other health professionals, and the use of various medications
- *preventive actions taken*
- *private health insurance.*

Female respondents aged 18 to 64 years were also asked to complete a supplementary questionnaire relating specifically to women's health issues—screening for breast and cervical cancer, use of contraceptives, and breastfeeding of infants.

As well as basic demographic details, information was collected from respondents about:

- *age at leaving school*
- *level of qualifications*
- *employment status and occupation*—if unemployed, whether work was being sought
- *total income*—wages, pensions, and benefits
- *family composition.*

Surveys such as the 1989–90 NHS are valuable, as detailed information about this many items cannot be collected in most other situations. For example, in creating records of deaths and of hospital admissions it is practicable to collect basic demographic details and information about occupation, but not details of key social indicators, such as education or income. Using those sources, studies of the associations between death or hospital admission, and education or income would have to rely on estimates of education or income.

Information from the 1989–90 NHS is presented in a number of places in this report, mainly using results from the Institute's analyses of the unit record file purchased from ABS. The following sections provide details of self-assessed health status, recent illnesses and injuries, and long-term health conditions. Section 2.5 summarises information about risk factors, and Section 2.6 includes some data on screening for breast and cervical cancer. Analyses of the relationship between various sociodemographic variables and health status and risk factors are presented in Sections 4.1 and 4.4.

Overview of findings of the 1989–90 NHS

According to the 1989–90 NHS, 30 per cent of males and 29 per cent of females aged 18 years or over reported that their health status was excellent, and a further 50 per cent of males and females that it was good. (It should be noted that these proportions have not been adjusted to account for the higher numbers of females than males in the older age groups.) Only 20 per cent of males and 21 per cent of females reported their health status as fair or poor.

As would be expected, the proportions reporting excellent health status were lower among those reporting a recent illness or the presence of a long-term health condition than among those without a recent or long-term condition. For males, 27 per cent of those who reported a recent and/or long-term condition described their health status as excellent, compared with 47 per cent of those who reported no conditions. For females, the proportions were similar, 27 per cent and 48 per cent.

Although most Australian adults assessed their health status as excellent or good, 68 per cent of males and 78 per cent of females reported experiencing one or more illnesses and/or injuries in the two weeks prior to being interviewed (ABS 1991e). As well, 64 per cent of males and 68 per cent of females reported having one or more long-term health conditions. Only 19 per cent of males and 14 per cent of females reported having neither a recent illness nor a long-term condition (some people reported both recent and long-term conditions).

The proportions reporting one or more long-term conditions increased with age (Figure 2.15), with 96 per cent of people aged 75 years or over reporting one or more conditions. Except for the youngest group (less than 5 years of age), the pattern for recent illness was similar.

Recent illness

Headache of unspecified cause was the most common recent illness, with 9.7 per cent of males and 14.7 per cent of females reporting having had a headache in the two weeks prior to interview (Table 2.4). A common cold had been experienced in the previous two weeks by 9.6 per cent of people (with similar proportions of males and females) and 6.5 per cent of males and 9.4 per cent of females reported hypertension as a recent illness. A recent injury of some sort had been experienced by 8.0 per cent of males and 6.3 per cent of females, and 4.8 per cent of males and 6.3 per cent of females reported a recent skin condition. Other commonly reported recent illnesses were dental problems, arthritis and asthma.

Headache of unspecified cause was more commonly reported by young and middle aged adults than by younger or older people (Figure 2.16). The age pattern was similar for males and females, and the proportion of females reporting a headache was consistently higher than that of males, except for the 0–4 year age group.

Almost one in four males and females in the 0–4 year age group had experienced a common cold in the previous two weeks, and the proportions reporting having had a cold declined with age (Figure 2.16). The age-specific proportions of males and females were virtually identical.

For most age groups, the proportions of males and females reporting injuries were similar. However, men aged 15 to 34 years experienced about 70 per cent more injuries than women in that age range (Figure 2.16). For recent dental problems, women aged 15 to 24 years and 25 to 34 years reported around 50 per cent more problems than did men of those age groups (Figure 2.16). Otherwise, the age-specific proportions of males and females reporting dental problems were similar.

The age patterns for hypertension, skin conditions, asthma and arthritis (which were also reported frequently as long-term conditions) are considered in the next section.

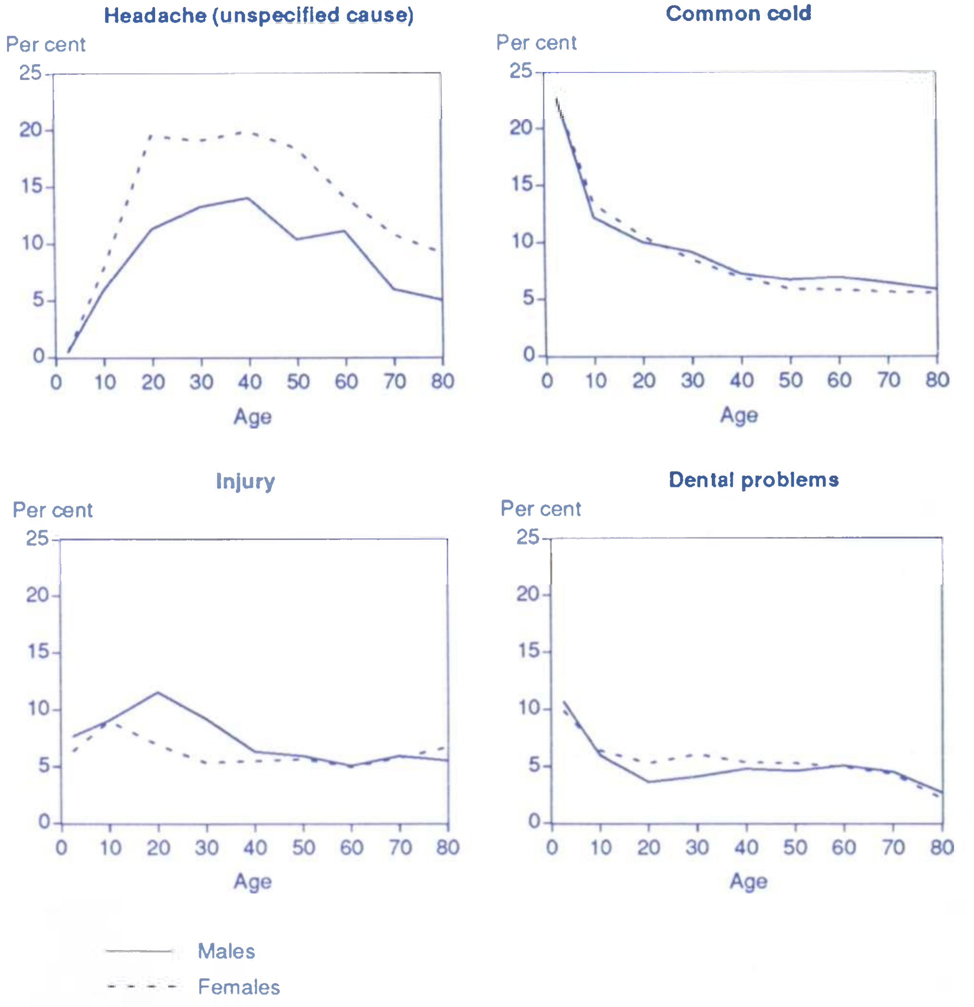
Table 2.4: Recent illnesses, eight most reported conditions, proportions by sex, 1989–1990

(Per cent)

Condition	*Males*	*Females*	*Persons*
Headache (unspecified cause)	9.7	14.7	12.2
Common cold	9.7	9.4	9.6
Hypertension	6.5	9.4	7.9
Injuries	8.0	6.3	7.1
Eczema, dermatitis	4.8	6.3	5.5
Dental problems	5.0	5.6	5.3
Arthritis	3.4	6.1	4.7
Asthma	4.5	4.1	4.3

Source: Australian Institute of Health and Welfare, derived from ABS 1989–90 National Health Survey

Figure 2.16: Reported recent illnesses, proportions by age and sex, 1989–1990



Source: AIHW, derived from ABS 1989–90 NHS

Refer to Appendix 1, Table A10

Long-term conditions

As noted above, 64 per cent of males and 68 per cent of females reported having one or more long-term health conditions. The most commonly reported long-term conditions were eyesight disorders of refraction or accommodation (reported by 32 per cent of people), arthritis (10.6 per cent), hay fever (9.8 per cent), unspecified back troubles (8.1 per cent), asthma (8.0 per cent), hypertension (7.1 per cent), deafness (4.0 per cent) and eczema or dermatitis (3.7 per cent) (Table 2.5).

Slightly more females than males reported an eyesight disorder of refraction or accommodation (Table 2.5), with a slight excess occurring for virtually every age group (Figure 2.17). Overall, 0.8 per cent of males and 0.7 per cent of females reported being blind, the proportions increasing with age.

Arthritis was reported more commonly by females than males, but the reverse was true for unspecified back troubles (Table 2.5 and Figure 2.17). Among other musculoskeletal conditions, 3.1 per cent of males and 2.1 per cent of females reported disorders of inter-vertebral discs, and gout was reported by 1.8 per cent of males and 0.4 per cent of females. Overall, 29 per cent of males and 32 per cent of females reported having a long-term musculoskeletal condition.

Slightly more females than males reported hay fever as a long-term condition, but the proportions of males and females reporting asthma as a long-term health condition were much the same (Table 2.5). As well as those reporting asthma as a long-term health condition (with or without a recent episode), 0.5 per cent of the population reported the condition as just a recent illness (ABS 1991d). In total, 8.5 per cent of the population reported asthma as a long-term and/or recent health condition.

The age-specific proportions of males and females reporting hay fever were similar (Figure 2.17). The main difference between males and females in reported asthma was for children: for the 0–4 year age group, 10.5 per cent of boys and 7.9 per cent of girls were reported as having asthma; for the 5–14 year age group, 17.8 per cent of boys and 12.5 per cent of girls had asthma (Figure 2.17).

Among other long-term respiratory conditions, bronchitis or emphysema was reported by 2.9 per cent of males and 3.0 per cent of females. Overall, 24 per cent of males and 27 per cent of females reported a long-term respiratory condition (including hay fever).

Hypertension was reported as a long-term condition by 6.1 per cent of males and 8.2 per cent of females. As expected, few young people reported hypertension as a long-term condition. From the 35 to 44 year age group, the proportions increased markedly, with more females than males reporting hypertension (Figure 2.18).

Of other diseases of the circulatory system, heart disease was reported by 2.0 per cent of males and 1.7 per cent of females. The proportions reporting heart disease increased markedly with age with the increase for males occurring at a younger age than that for females (Figure 2.18).

Table 2.5: Long-term health conditions, eight most reported conditions, proportions by sex, 1989–1990

(Per cent)

Condition	*Males*	*Females*	*Persons*
Eyesight disorders of refraction or accomodation	28.4	34.6	31.5
Arthritis	8.3	13.0	10.6
Hay fever	9.0	10.6	9.8
Back trouble (unspecified)	8.8	7.3	8.1
Asthma	8.2	7.9	8.0
Hypertension	6.1	8.2	7.1
Deafness	5.1	3.0	4.0
Eczema, dermatitis	2.9	4.5	3.7

Source: Australian Institute of Health and Welfare, derived from ABS 1989–90 National Health Survey

Similarly, cerebrovascular disease (including stroke after-effects)—reported as a long-term condition by 0.5 per cent of males and 0.4 per cent of females—was largely a condition reported by the older age groups, and from slightly younger ages for males than females (Figure 2.18).

Another fairly commonly reported condition of the circulatory system (though less serious) was varicose veins, which was reported by 1.0 per cent of males and 3.9 per cent of females.

Overall, 12.6 per cent of males and 18.6 per cent of females reported a long-term condition of the circulatory system.

Deafness, another strongly age-correlated long-term condition (Figure 2.17), was reported by more males than females (Table 2.5). The difference between males and females was consistent through all age groups.

The most frequently reported long-term skin condition was the group defined as eczema or dermatitis (2.9 per cent of males and 4.5 per cent of females). The higher overall proportion for females was mainly due to the much higher proportion of young adult females reporting a long-term skin condition compared with young adult males (Figure 2.18). For the older age groups, more males than females reported a skin condition. Acne, a skin condition affecting teenagers almost exclusively, was reported by 1.5 per cent of males and 1.1 per cent of females aged 15 to 19 years.

In total, long-term skin conditions were reported by 5.1 per cent of males and 6.4 per cent of females.

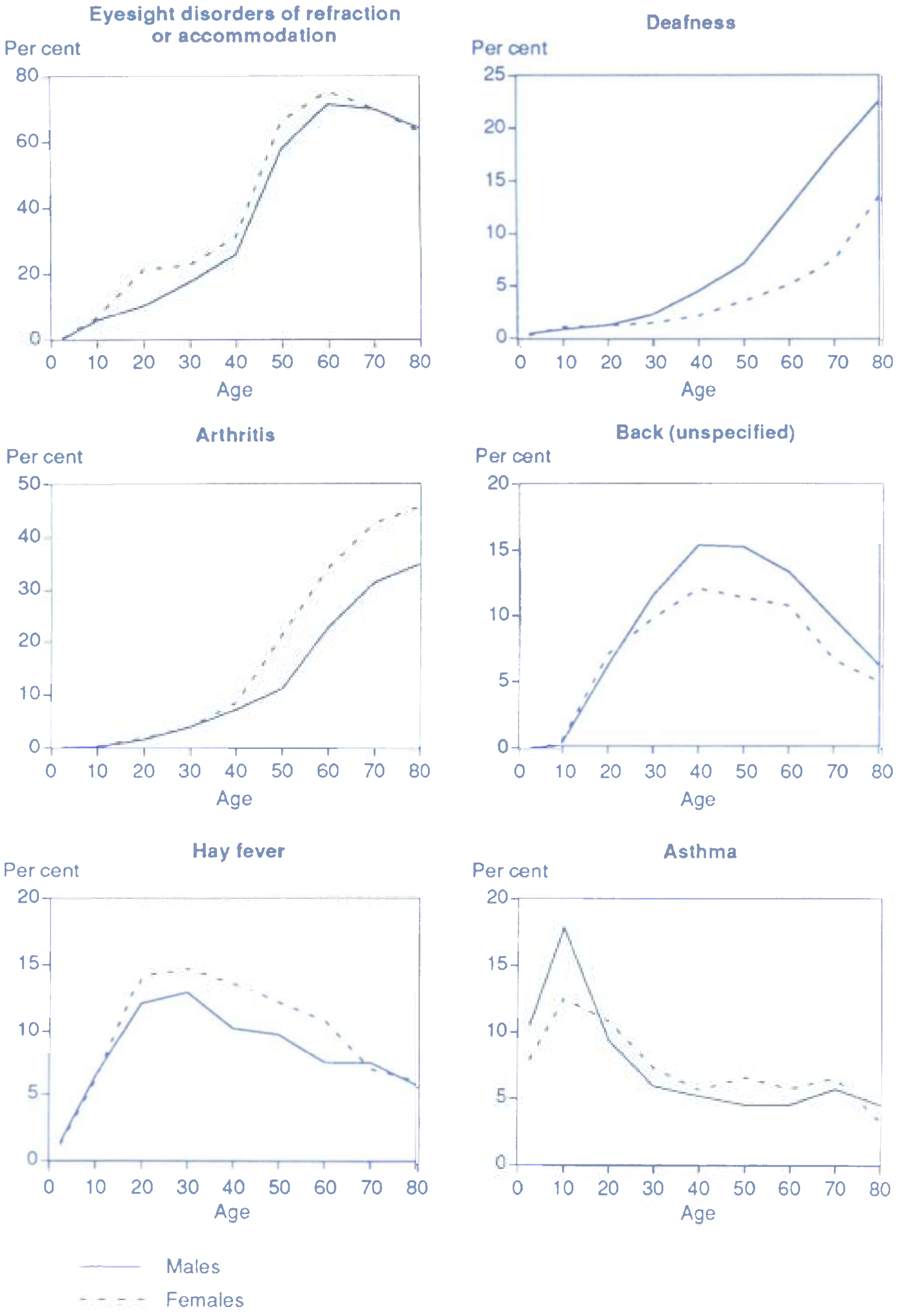
Of the many other conditions for which the 1989–90 NHS provides estimates (see ABS 1991e, 1992b), details of only a few can be summarised here.

Diabetes mellitus was reported as a long-term condition by 1.2 per cent of males and 1.1 per cent of females. An additional 0.1 per cent of males and 0.2 per cent of females reported 'high blood sugar' as a long-term condition. The proportions of people reporting diabetes increased with age, with only slight differences between the sexes in age-specific proportions (Figure 2.18).

Cancer was reported as a long-term condition by 1.6 per cent of both males and females. Among young adults, a slightly higher proportion of females than males reported a cancer, but, for the older age groups, the proportion of males was higher than that of females (Figure 2.18).

Of nervous system conditions, 2.1 per cent of males and 4.7 per cent of females reported migraine as a long-term condition (Figure 2.18), and 0.5 per cent of both males and females reported epilepsy. For both sexes, the conditions were more commonly reported by young and middle aged adults than by children or older people.

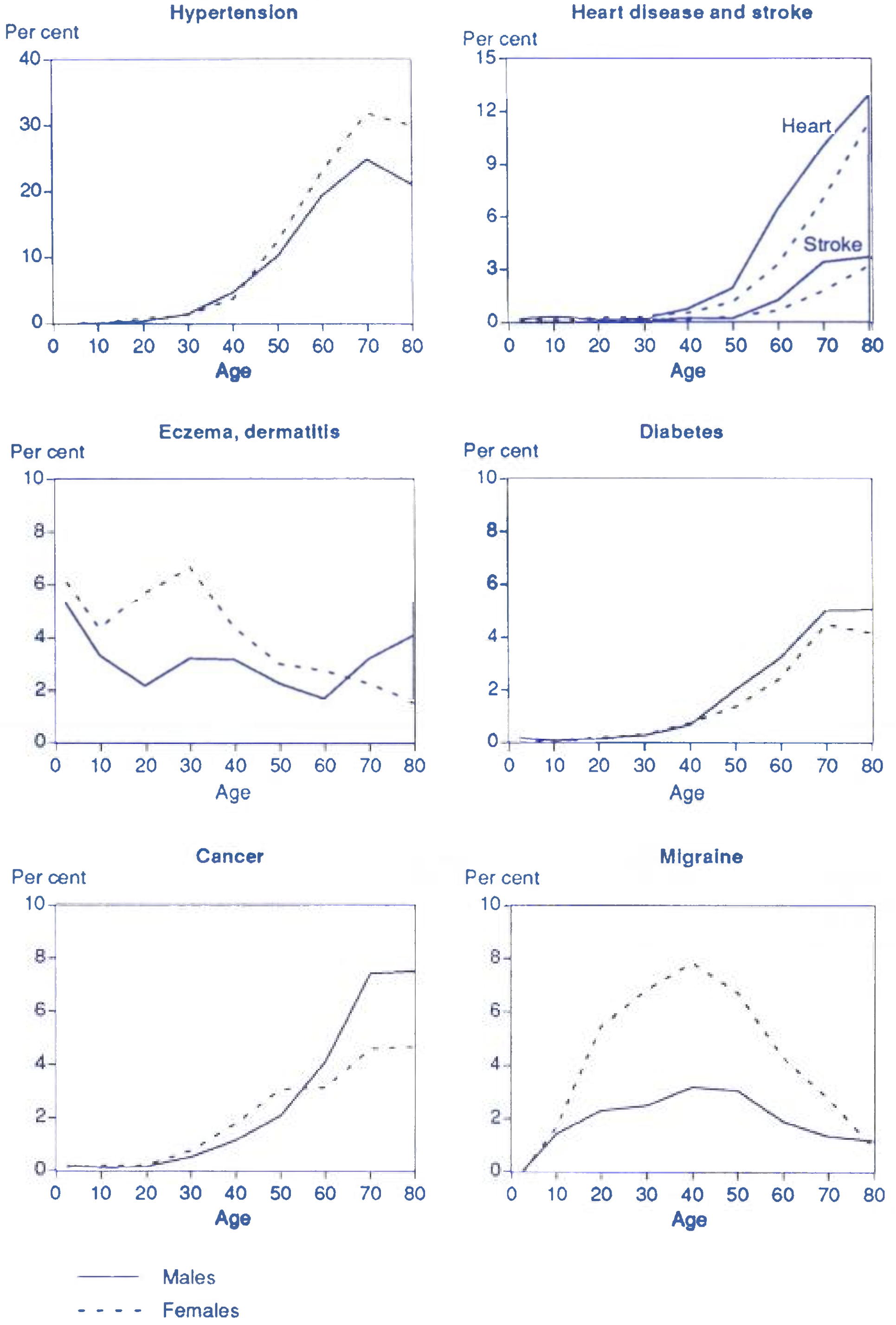
Figure 2.17: Reported long-term health conditions, proportions by age and sex, 1989–1990



Source: AIHW, derived from ABS 1989–90 NHS

Refer to Appendix 1, Table A11

Figure 2.18: **Reported long-term health conditions, proportions by age and sex, 1989–1990**



Source: AIHW, derived from ABS 1989–90 NHS

Refer to Appendix 1, Table A11

Cancer

Cancer is a diverse group of diseases characterised by the proliferation and spread of abnormal cells. These abnormal cells can invade and destroy surrounding tissue and spread (metastasise) to distant parts of the body. Cancer can develop from most types of cells, and each cancer has its own pattern of local behaviour and metastasis. While some cancers share common causes or risk factors, most cancers are believed to have a unique set of factors which are responsible for their initiation.

Collectively, an estimated 190,000 new cancers occur in Australia each year and cancer was the second leading cause of death in 1990, being responsible for 27 per cent of male deaths and 24 per cent of female deaths (see section 2.2).

Reflecting the importance of this group of diseases, each State and Territory has established a cancer registry, which collects information about people who have been diagnosed with most cancers (incidence data), as well as collating mortality data. Registration of cancers is mandatory under legislation in all States and Territories except Tasmania and the ACT, which at present operate under a voluntary reporting system, although both are in the process of drafting legislation. Reports on new cases of cancer are collected from pathologists, hospitals, nursing homes, cancer treatment centres and the State/Territory registries of births, deaths and marriages. These reports are combined to form a person- and tumour-based registry system.

Registration of cancer commenced in some States and the ACT in the 1970s, but national incidence data have only been available since 1982. The latest national data available from the National Cancer Statistics Clearing House, located at the Institute, are for cases diagnosed in 1985. These data form the basis of the material presented in this section.

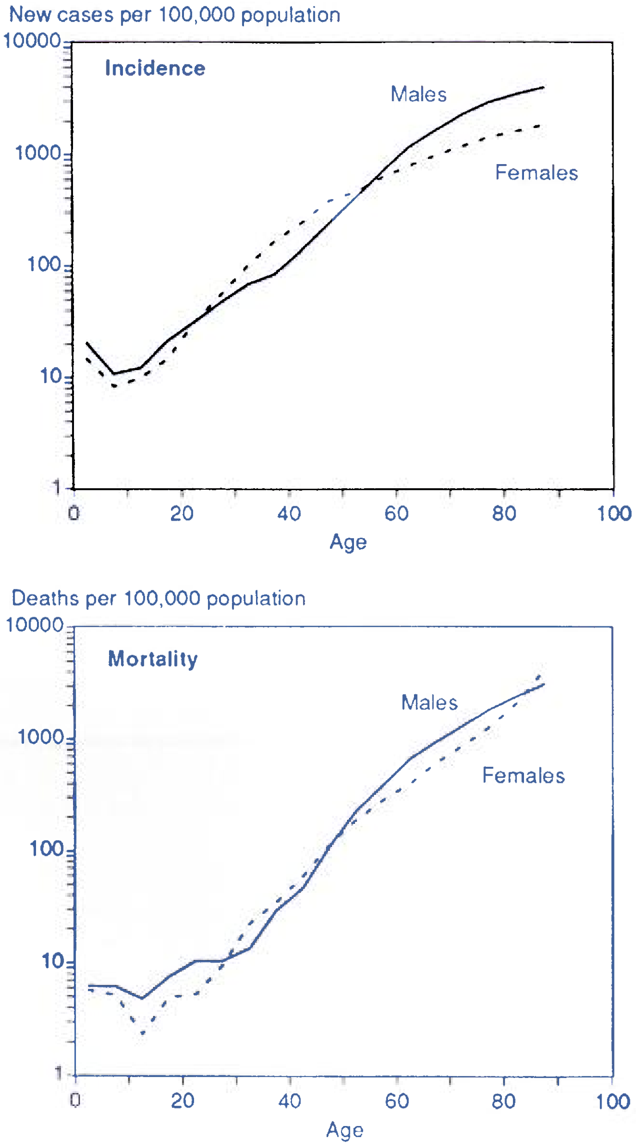
Incidence and mortality

Excluding non-melanocytic skin cancers (which are not recorded by all registries), in 1985, there were 28,476 new cancer cases registered for males and 23,094 cases for females. In the same year, 15,818 males and 12,130 females died of cancer. The age-standardised incidence rate for males (307 cases per 100,000) was 32 per cent higher than that for females (233 per 100,000). The mortality difference between males and females was even higher: the age-standardised death rate for males (164 deaths per 100,000) was 62 per cent higher than that for females (101 per 100,000). This difference reflects the greater incidence for males than for females, and the higher fatality of the cancer mix experienced by males.

The risk of developing cancer increases generally with age (Figure 2.19), with the number of cancers detected after age 50 years being 4.9 times the number detected before this age. Although, as noted above, the overall incidence of cancer is higher for males than females, for young and middle aged adults (aged 25 to 55 years), the incidence is higher for females than males. This reflects largely the fact that female-only cancers (such as cancer of the cervix, uterus and breast) have an age-specific incidence rate almost three times that of the male-only cancers in this age group. As well, age-specific rates for thyroid cancer are higher for females than for males. For the older age groups, the incidence of most cancers is much higher for males than for females.

Deaths due to cancer show a similar trend with age, although the male and female age-specific rates are more similar for deaths than for incidence (Figure 2.19).

Figure 2.19: Malignant neoplasms (excluding non-melanocytic skin cancer), age-specific incidence and death rates by sex, 1985



Source: National Cancer Statistics Clearing House (unpublished) *Refer to Appendix 1, Table A12*

Specific cancers

The most common of all cancers are non-melanocytic skin cancers (NMSCs), but details of these cancers are not recorded by all cancer registries as many of them are not histologically confirmed or reported. These cancers, almost entirely basal cell and squamous cell carcinomas, are often self-detected and usually removed in doctors surgeries by simple excision, curettage, or cryosurgery. Many lesions removed in this manner are cancerous, but others may be solar keratoses or other non-cancerous skin disorders. NMSCs are much less life-threatening than many other cancers, provided the lesions are treated early in their course, but even so were responsible for the deaths of 269 people in 1990 at an age-standardised rate of 21 per 100,000 for males and 16 per 100,000 for females.

Survey methods are the most appropriate way to ascertain the level of NMSC incidence in the population. Based on a national survey conducted in 1985, it has been estimated that the age-standardised incidence rate of treated NMSCs was 823 cases per 100,000 population (Giles, Marks, Foley 1988). The incidence rate of basal cell carcinoma was 657 cases per 100,000 and of squamous cell carcinoma 166 per 100,000. Overall, the incidence of NMSCs was higher for males than females, but this was almost entirely due to differences in those aged 60 years or more.

NMSCs are more than three times as common as all other forms of cancer combined. In terms of individual cancers, the incidence of NMSCs is approximately 12 times higher than that of lung cancer for males, and 7.5 times higher than that of breast cancer for females.

After NMSCs, the most common site for new cancers for males was the lung, with 53 new cases per 100,000 population in 1985 (Figure 2.20). The next most frequently reported new cancers for males were cancer of the prostate (42 per 100,000) and colon cancer (29 per 100,000). For females, the breast was second to NMSCs as the most common site for new cancers (59 per 100,000), the next most frequent site being the colon (24 per 100,000). Cancers of the colon and rectum are separated for statistical purposes, but they have common risk factors (Giles, Armstrong, Smith 1987). When combined, they are the third most common cancer in males (46 per 100,000) and females (34 per 100,000).

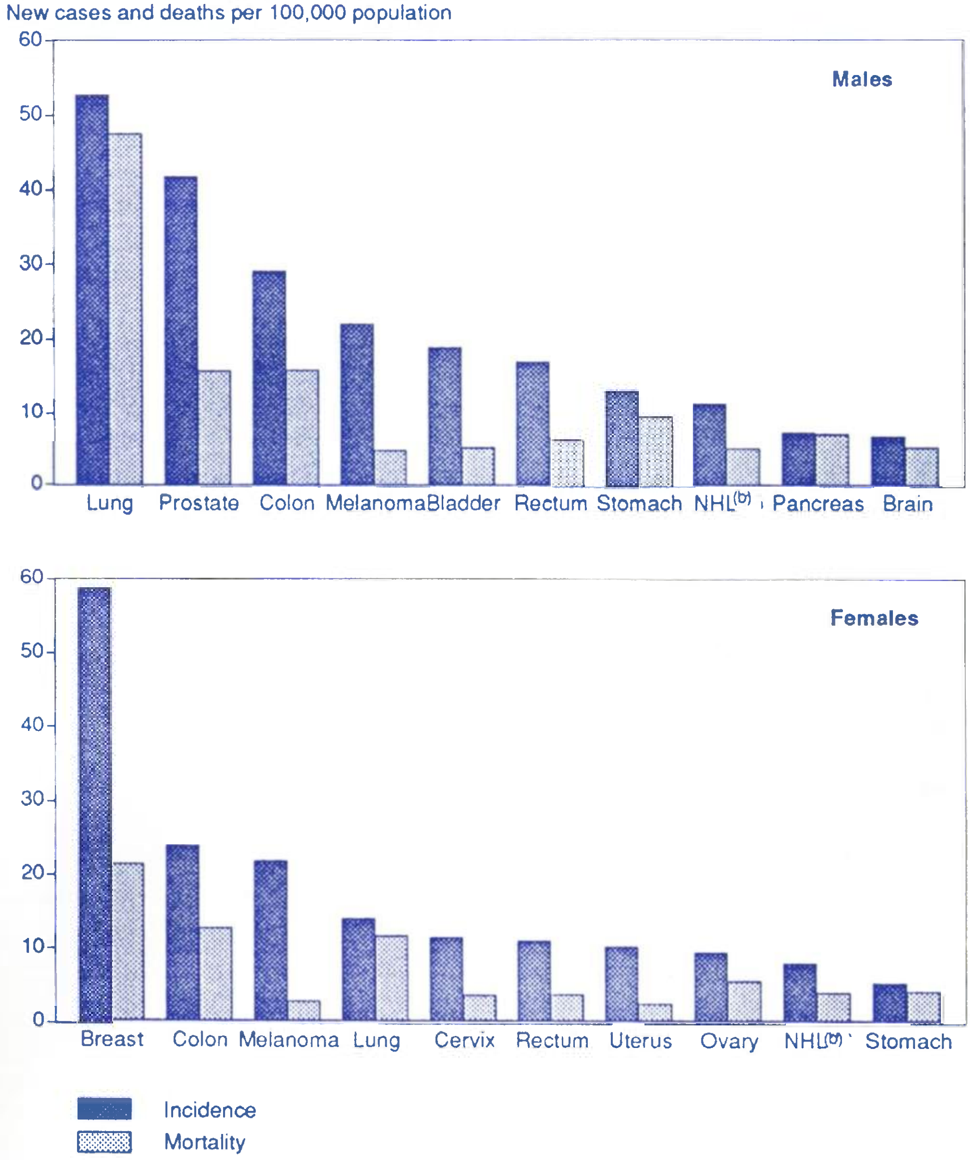
Of the most frequent cancers excluding NMSCs, survival rates of those diagnosed with lung cancer are particularly poor. It has been estimated that the 5-year relative case survival for lung cancer is 11 per cent, much lower than for breast cancer, which is 75 per cent (Bonett et al. 1991). (Relative case survival is the chance of surviving if all other causes of death are removed.)

Of the more common cancers occurring in both sexes, the incidence is greater for males than for females. The largest differential is for lung cancer, which occur 3.8 times more commonly in males than females. The incidence of melanoma is marginally higher in males than females.

As noted above, cancers occur largely among the middle and older age groups. However, some cancers are more common among children. Of 479 new cancers diagnosed in 1985 in children aged less than 15 years, the most common were acute lymphocytic leukemia (146 cases—30 per cent), brain and other nervous system (107 cases—22 per cent) and myelocytic leukemia (23 cases—5 per cent).

Cancer incidence rates varied little between 1982 and 1985. Small increases in age-standardised incidence rates were observed for colon cancer in males, and lung and breast cancer in females. For both sexes, the incidence of melanoma increased. For males, the incidence of lung and prostate cancer declined; for females, the incidence of cervical and bladder cancer declined.

Figure 2.20: Leading cancers (excluding non-melanocytic skin cancer), age-specific incidence and death rates[a] by sex, 1985



(a) Age-standardised to the World Standard Population
(b) Non-Hodgkin's lymphoma

Source: National Cancer Statistics Clearing House (unpublished) *Refer to Appendix 1, Table A13*

In response to concerns about the impact of cancer on the community, the Health Targets and Implementation Committee (1988) made preventable cancers one of their five priority areas for disease prevention strategies. As a result, the National Better Health Program (see Section 3.9) has set targets for reductions in the incidence of lung, breast, cervical and skin (melanoma and non-melanoma) cancers. These targets were reviewed in *Australia's health 1990* (AIH 1990), and more details about breast and cervical cancer screening programs and lung cancer are included in Section 2.6.

Dental health

Dental health problems were among the health conditions reported most frequently in ABS's 1989–90 National Health Survey. Many dental problems either re-occur at the same site or in many different sites in the mouth. Through this process, there is a cumulative impact of many dental problems on the teeth or their supporting structures.

There are two major dental health problems: loss of teeth and dental decay. Loss of teeth can arise from a number of causes such as dental decay, periodontal disease (disease of the gums), or trauma. Loss of teeth is measured either by the percentage of the population who are edentulous (have lost all their natural teeth) or by the number of missing teeth in those individuals who still have one or more natural teeth.

As well as the information on edentulism and dental decay presented in this section, Section 4.3 summarises evidence for differentials in dental health status between sub-groups of the Australian population characterised by age, occupation and education, and, for children, by Aboriginality.

Edentulism

Historically, Australian adults have had a comparatively high rate of edentulism. However, the percentage of edentulous adults is rapidly declining: data from the National Oral Health Survey, an Australia-wide household survey conducted between March 1987 and October 1988 under the auspices of the Commonwealth Department of Community Services and Health, revealed that there had been a substantial decline in edentulism since 1979 (ABS 1980) (Table 2.6).

Table 2.6: Edentulism(a), age-specific prevalence by sex, 1979 and 1987–1888

(Per cent)

	1979			*1987–1988*		
Age group (years)	*Males*	*Females*	*Persons*	*Males*	*Females*	*Persons*
5–14	—	—	—	—	—	—
15–24	—	—	—	0.4	—	0.2
25–34	4.7	6.0	5.4	0.6	1.6	1.1
35–44	11.0	17.2	14.0	4.5	7.8	6.2
45–54	20.3	33.1	26.5	11.7	21.5	16.7
55–64	32.8	47.3	40.2	22.0	53.4	27.8
65 and over	59.7	71.5	63.4	41.1	57.0	50.2

(a) Total tooth loss.

Source: ABS 1980; AIHW DSRU derived from 1987–88 National Oral Health Survey

Edentulism increases with age, with women having a much higher prevalence of edentulism than men at all ages beyond 24 years. Between 1979 and 1987–1988, the proportionate reduction in edentulism was highest among young adults, but the largest absolute reduction occurred among persons aged 65 years or older, where the prevalence of edentulism declined from 66 to 50 per cent.

There is no biological basis for the wide disparity in edentulism observed between men and women, and it is necessary to consider gender factors. Women make greater use of dental services, and their treatment has been affected by prevailing stereotypes (Davis 1986). During the first half of this century, complete extractions and the use of full dentures were seen frequently as the only reliable means of avoiding what was believed to be the inevitable breakdown of oral health. Consequently, women who developed some dental decay often were encouraged to have all teeth extracted—'dental sanitisation'—prior to marriage. In contrast, men with similar amounts of dental decay were less likely to visit a dentist, had roles which were perceived not to require such a level of 'dental sanitisation', and were more likely to ignore advice to have teeth extracted.

Differences in edentulism between men and women appear to be smaller among more recent cohorts. During the last few decades, perceptions about the inevitability of dental disease have changed and there is a widespread professional and community view that most teeth can be retained with moderate levels of self-care and dental treatment. Consequently, the fitting of full dentures prior to a woman's marriage would now be extremely unusual. As well, there probably has been a shift in perceptions about appropriate levels of dental health for men, with the result that they are more likely to seek and obtain conservative dental care.

Dental decay

While edentulism has decreased, most people still have substantial experience of dental decay, as measured by the DMFT index (Box 2.5). Results from the 1987–88 National Oral Health Survey reveal that, as expected, the DMFT index rises with age (Figure 2.21). Children aged 5 to 14 years had relatively low dental caries experience, and virtually no missing teeth from decay. Furthermore, very few of the teeth in children of this age range had untreated decay.

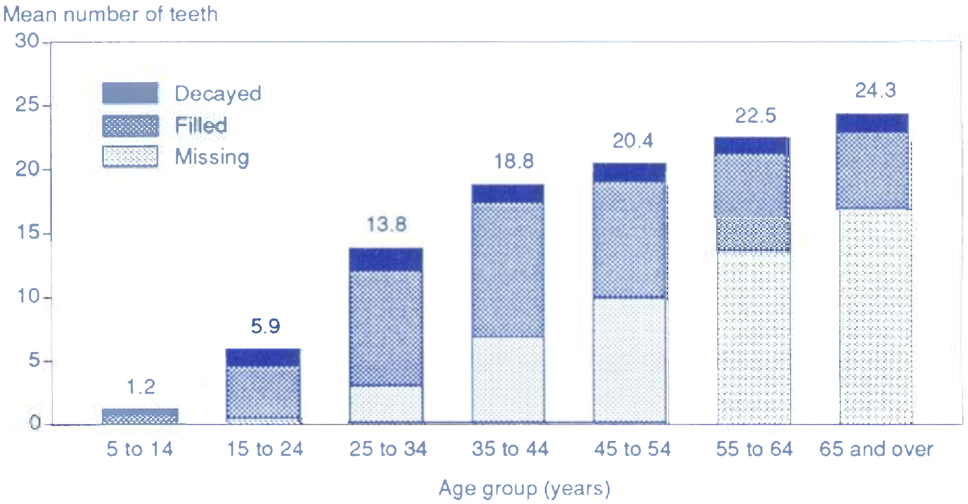
For people aged 15 years or older, the mean number of missing teeth increased with age. Dentate persons (people with one or more natural teeth) aged 65 years or older had a mean number of 17 missing teeth, representing more than a half of the complete dentition of 32 teeth. The mean number of filled teeth was highest in persons aged 35

Box 2.5: Dental caries experience

A person's experience with dental caries is measured using an index of decayed, missing or filled teeth (DMFT for permanent dentition and dmft for deciduous dentition), calculated by summing the teeth which are decayed (D/d), missing (M/m) or filled (F/f) due to dental caries. For people under 30 years of age, missing teeth which had been extracted for decay contribute to the index, but extractions for other reasons do not (WHO 1987). For older people, all missing teeth (regardless of the reason for extraction) are included.

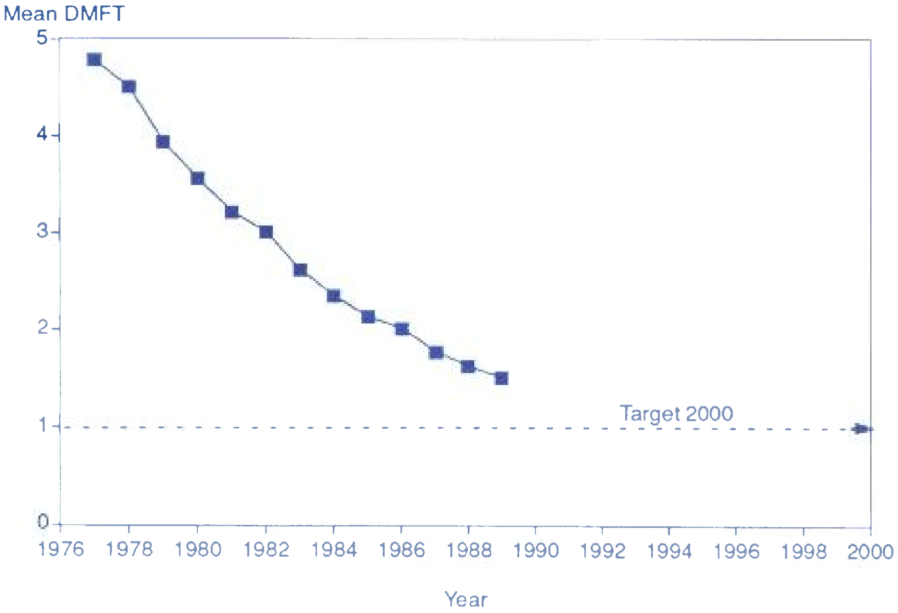
The index represents the cumulative experience of each person's extent of decay. It also captures partial tooth loss among those people with some natural teeth.

Figure 2.21: Dental caries experience, by age group, 1987–1988



Source: AIHW DSRU, from 1987–88 National Oral Health Survey *Refer to Appendix 1, Table A14*

Figure 2.22: Dental caries experience[(a)] of 12-year-old school children, 1977 to 1989



(a) Mean decayed, missing and filled teeth.

Source: AIHW DSRU, from 1987–88 National Oral Health Survey *Refer to Appendix 1, Table A14a* to 44 years, and lower towards each end of the age spectrum. The most consistent part of the index in the adult ages was the number of decayed teeth which ranged from 1.26 (55- to 64-year-olds) to 1.80 (25- to 34-year-olds).

Among children, the extent of dental decay has decreased markedly over recent years. Since 1977, data have been available through the Child Dental Health Survey on the caries experience of children treated by the Australian school dental services. Caries experience, measured by the DMFT index, for 12-year-old children decreased from 4.8 in 1977 to 1.5 in 1989 (Figure 2.22). From South Australian data, current projection models indicate a levelling off at somewhat less than the target of 1.0 in the year 2000 (Slade, Spencer, Dooland 1990).

2.4 Disability and handicap

Non-fatal consequences of disease and injury are seen in impairments, disabilities and handicaps, about which the most recent comprehensive source of information in Australia is ABS's 1988 Survey of Disabled and Aged Persons. Those surveyed included approximately 67,000 people from households and about 6,700 from 535 health establishments (ABS 1990).

Based broadly on WHO recommendations, ABS defined a disabled person as someone who had one or more of a group of selected impairments and disabilities which had lasted, or were likely to last, for six months or more. Disabling conditions were subdivided into:

- *mental disorders*—including mental retardation, mental degeneration, slowness at learning, and other mental disorders; and
- *physical conditions*—including loss of sight, loss of hearing, incomplete use of limbs or digits, restriction in physical activities or in doing physical work, and long-term conditions requiring treatment or medication.

The survey identified up to five disabling conditions for each person. The condition reported by the person as causing the most problems was identified as the primary disabling condition, and information was also collected on the cause of that condition.

People were defined as handicapped if their disability limited their capacity to perform tasks in one or more of five functional areas:

- *self-care*
- *mobility*
- *verbal communication*
- *schooling*
- *employment.*

Children under the age of 5 years with disabilities were all regarded as being handicapped. According to the extent to which the person was limited in performing these tasks, the handicap was classified as:

- *severe*—unable to perform one or more tasks relevant to these functions without personal help or supervision
- *moderate*—personal help or supervision not required, but some difficulty experienced in performing the tasks
- *mild*—no difficulty in performing the tasks, but an aid used or difficulty experienced in walking 200 metres or up and down stairs.

Severity of handicap was not determined for children less than 5 years of age, or for people with only a schooling or employment limitation.

These definitions were used in the 1988 survey (ABS 1990), and in a similar survey conducted by ABS in 1981 (ABS 1982). However, it should be noted that the definitions of disability and handicap used by ABS do not necessarily match those used in various government assistance programs (for example, eligibility for an invalid pension or nursing home admittance).

Disability

In 1988, one or more disabilities was reported by 15.6 per cent of Australians (2.54 million people) (ABS 1990), substantially higher than the proportion in 1981, 13 per cent (ABS 1982). However, a greater propensity of people to report a disability in 1988, particularly after the 1981 International Year of Disabled People, could well have contributed to much of this increase.

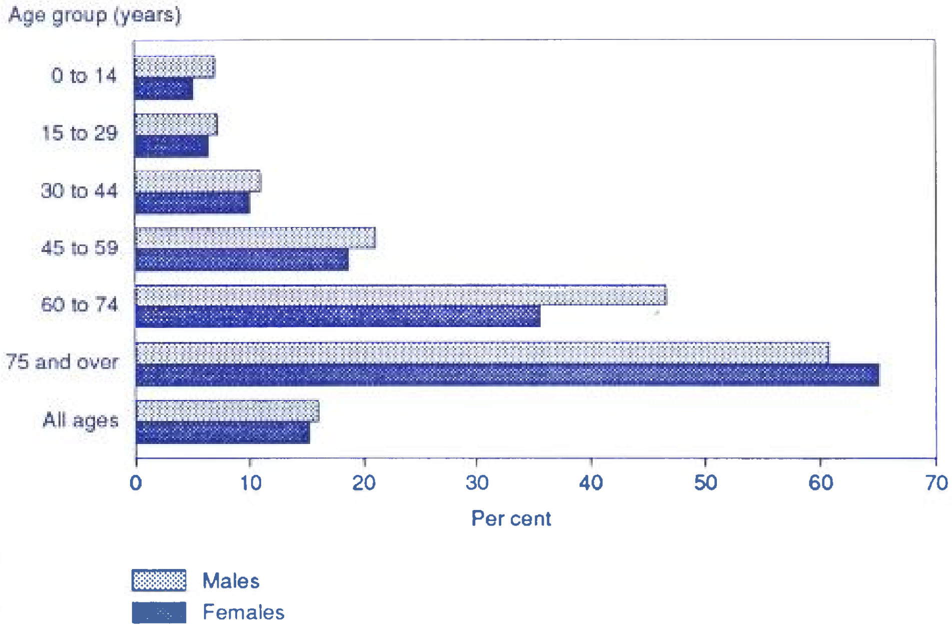
The proportions of people reporting disabilities rose uniformly with age. One or more disabilities were reported by 64 per cent of the 686,600 people aged 75 years or more, compared with 6.8 per cent of the 4.05 million people aged 15 to 29 years.

Except for those aged 75 years or over, the proportions of males reporting one or more disabilities were uniformly higher than the proportions of females (Figure 2.23, Table 2.7). This overall pattern reflects the proportions reporting a physical disability, with the pattern for mental disability being slightly different. For those reporting a mental condition as the primary disabling condition, the proportion of males was higher than that of females at young ages; was the same for age group 30 to 44 years; and thereafter the proportion of females exceeded that of males.

The most frequently reported primary disabling conditions were those of the musculoskeletal system and connective tissue, with 4.3 per cent of Australians (696,700 people) being disabled by these conditions. The proportions of people identifying a musculoskeletal condition as their primary disabling condition increased markedly with age (Table 2.7). The proportions of males and females were similar, except for those aged 75 years or over (the difference in this group largely reflects the higher proportions of females aged 85 years or over).

The next most frequently reported primary disabling conditions were hearing loss (2.1 per cent—345,600 people) and conditions of the circulatory system (1.7 per cent—280,300 people). The proportions reporting conditions in these groups increased with age, and higher proportions of males than females reported hearing loss or a disabling circulatory system condition for nearly every age group (Table 2.7).

Figure 2.23: Primary disabling conditions, age-specific proportions by sex, 1988



Source: Australian Bureau of Statistics 1990

Refer to Table 2.7

Handicap

In 1988, 13.0 per cent of the population (2.12 million people) reported being handicapped in some way by their disability (ABS 1990). As with the proportions reporting a disability, this represents a substantial increase from the almost 9 per cent who reported a handicap in 1981 (ABS 1982). Again, much of the increase could be due to a greater propensity to report a handicap, particularly of mild or moderate severity. This appears likely in view of the proportions reporting that they were severely handicapped by their disability—4 per cent in both 1981 and 1988.

In 1988, the proportions of people reporting that they were handicapped increased with age, except for the slightly lower level for the 15 to 29 year age group compared with the 5 to 14 year age group. Of people aged 75 years or more, 58 per cent (398,800 people) reported that they were handicapped, compared with 5.1 per cent (206,400 people) of those aged 15 to 29 years.

The age-specific patterns of males and females who reported that they were handicapped by their disability were similar to those for all disabling conditions: the proportions of males exceeded those of females for all age groups except for the 75 years and over age group (Figure 2.24). However, for all except the youngest age group for which severity was determined (5 to 14 years), a higher proportion of females than males reported that they were severely handicapped by their disability.

Table 2.7: Primary disabling conditions[a], age-specific proportions by sex, 1988

(Per cent)

Primary disabling condition	*Age group (years)* 0 to 14	15 to 29	30 to 44	45 to 59	60 to 74	75 and over	All ages[b]
Males							
Mental retardation etc.	1.4	1.1	0.4	0.3	0.4	1.1	0.8
Other mental disorders	0.6	0.6	1.1	1.3	2.3	2.2	1.0
All mental disorders	1.9	1.7	1.6	1.6	2.7	3.2	1.8
Sight loss	0.2	0.5	0.4	0.6	1.5	4.9	0.6
Hearing loss	0.7	0.9	1.8	3.7	8.0	12.2	2.6
Nervous system disorders	0.8	0.7	0.8	1.1	2.3	3.5	1.1
Circulatory diseases	0.1	0.1	0.3	2.8	8.9	10.9	1.8
Respiratory diseases	1.9	0.5	0.6	1.1	5.3	3.9	1.6
Musculoskeletal	0.2	1.6	3.8	6.5	11.0	13.3	3.9
Other conditions	1.2	1.4	1.9	3.8	7.1	8.9	2.6
All physical conditions	5.2	5.6	9.5	19.6	44.0	57.7	14.2
All conditions	**7.0**	**7.2**	**11.0**	**21.1**	**46.6**	**60.7**	**16.0**
Females							
Mental retardation etc.	0.7	0.6	0.2	0.2	0.5	2.8	0.6
Other mental disorders	0.2	0.6	1.4	2.0	2.5	4.9	1.3
All mental disorders	0.8	1.1	1.6	2.1	3.0	7.6	1.9
Sight loss	0.2	0.2	0.3	0.5	1.9	6.5	0.8
Hearing loss	0.6	0.6	1.1	1.8	4.3	6.4	1.7
Nervous system disorders	0.6	1.0	0.8	0.9	1.1	3.8	1.0
Circulatory diseases	0.1	0.2	0.3	2.0	5.7	10.4	1.6
Respiratory diseases	1.1	0.8	0.9	1.1	1.8	1.7	1.1
Musculoskeletal	0.5	1.6	3.3	7.2	12.3	20.0	4.8
Other conditions	1.2	1.1	1.7	3.0	5.5	9.3	2.5
All physical conditions	4.3	5.3	8.5	16.5	32.7	58.0	13.8
All conditions	**5.1**	**6.4**	**10.0**	**18.7**	**35.6**	**65.1**	**15.2**

(a) Persons with a primary disabling condition with both a mental and physical manifestation are shown in both components but are included only once in 'All conditions'.

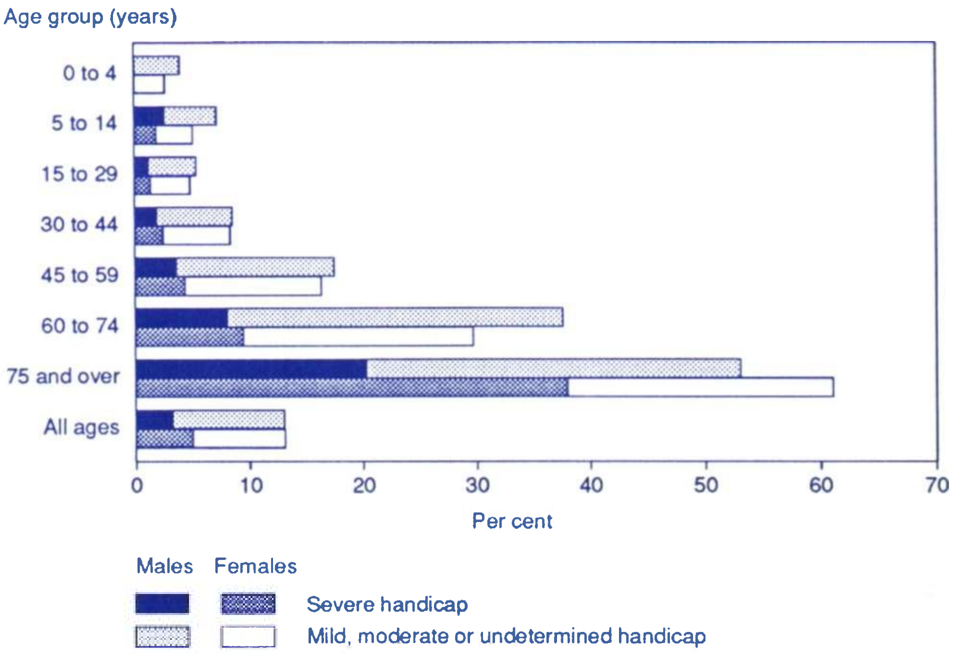
(b) Crude rate.

Source: Australian Bureau of Statistics 1990

The most frequent handicap was one of mobility, reported by 10.0 per cent of Australians (1.6 million people) and by 77 per cent of those with a handicap (ABS 1990). The next most frequently reported handicaps were employment (reported by 5.9 per cent of Australians and by 45 per cent of those with a handicap), self-care (5.6 and 43 per cent) and communication (2.5 and 19 per cent). (Note: people may be handicapped in more than one way.)

Of those who were severely handicapped, 44 per cent were handicapped in self-care, 34 per cent in mobility and 27 per cent in communication.

Figure 2.24: Handicap severity, age-specific proportions by sex, 1988



Source: Australian Bureau of Statistics 1990

Refer to Appendix 1, Table A15

2.5 Risk factors

Where and how people live can have very significant consequences for their health. As noted in 'Factors influencing health' (page 16), the physical and social environments and individual lifestyles contribute in complex ways to many of the causes of morbidity, disability and death.

In attempting to understand the relationship between these factors and health outcomes, epidemiologists examine the role of risk factors—attributes or exposures that are believed to be related to the chance of an individual developing a disease or suffering an injury. Risk factors may be correlated with known or unknown causes of the disease and, when combined with other risk factors, may further increase the chance of disease onset. Risk factors are identified by epidemiological research based on the facts that:

- disease patterns vary with changes in risk factors;
- the presence of the risk factor precedes the occurrence of the disease; and
- the observed relationship is independent of other risk factors.

There is some uncertainty about the strengths of particular risk factors for certain diseases, because methods of measurement can be imprecise or inconsistent (particularly for social or behavioural factors).

However, risk factors have been identified for various causes of morbidity, disability and death, and are used as the focus of health promotion and disease prevention campaigns (such as anti-smoking campaigns and nutrition programs). Often a risk factor associated with a particular disease is also a risk factor for other diseases, even though the causative process may be different (for example, the ways in which smoking contributes to lung cancer and coronary heart disease are different). Box 2.6 shows some of the common risk factors for selected health conditions. Of these risk factors, some are discussed in more detail below.

In Australia, data about risk factors are deficient in a number of areas (see AIH 1991), but useful information is collected from a variety of sources. Limited risk factor information is gained from the statutory collections of death certificates, cancer registrations or communicable diseases, and special surveys of health risk factors are conducted periodically.

The main sources of risk factor information used in this report are the National Heart Foundation's 1989 Risk Factor Prevalence Survey (1989 RFPS) and the ABS's 1989–90 National Health Survey (1989–90 NHS). The 1989–90 NHS was Australia-wide and had many more respondents than the 1989 RFPS (Box 2.7 gives a brief comparison of the two surveys, and more detail of the 1989–90 NHS is provided in '1989–90 National Health Survey', page 42), but the latter survey has the advantage of having measured height, weight and blood pressure and undertaken blood lipid analysis. As well as undertaking these physical measurements, the 1989 RFPS collected data on behavioural risk factors through a self-reported questionnaire. No physical measurements were made in the 1989–90 NHS, the survey relying instead on interviews to collect information on physical characteristics (height and weight), behavioural risk factors and health conditions. The 1989 RFPS also has an advantage in being the third in a series using the same protocol (the earlier surveys were conducted during 1980 and 1983), permitting an analysis of risk factors over time.

Because of uncertainty about the accuracy of self-reported information about physical characteristics and health conditions, this section draws more heavily on measured data from the 1989 RFPS than the interview data from the 1989–90 NHS.

Selected biological and behavioural risk factors

Blood pressure and hypertension

Estimates from the 1989 RFPS were based on the average of two consecutive blood pressure measurements taken 5 minutes apart at a single visit. The average systolic blood pressure was 129 mmHg for men and 122 mmHg for women, and the average diastolic pressure was 82 mmHg for men and 76 mmHg for women. Blood pressure was higher in the older age groups (Figure 2.25). A preliminary comparison of the 1989 estimates with those from the 1980 and 1983 surveys for the common age range (25 to 64 years) and common cities (Canberra and Darwin were not included in the 1980 and 1983 surveys) indicated that average levels of blood pressure have fallen over the 1980s, by similar amounts for men and women. Average systolic blood pressure fell by approximately 5 mmHg and average diastolic blood pressure by about 3 mmHg.

Box 2.6: Risk factors associated with major causes of morbidity, disability and death

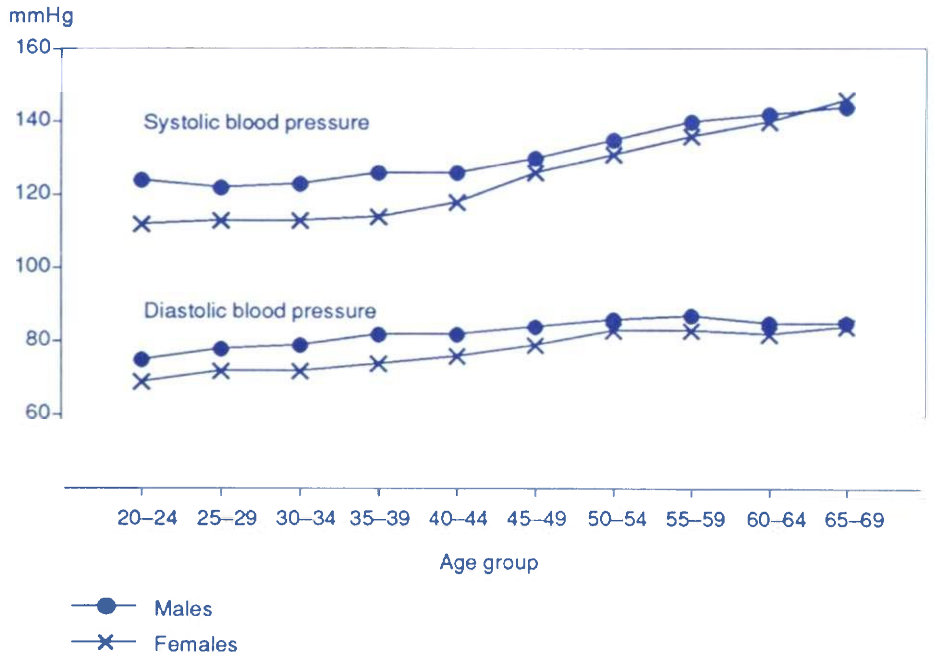
Risk factors	*Causes of morbidity, disability and death*
Smoking history	*Coronary heart disease, lung, cervical, buccal and digestive cancers, stroke, chronic lung disease*
Hypertension	*Coronary heart disease, stroke*
Excess alcohol consumption	*Digestive system cancer, motor vehicle accidents, other accidents, suicide, violence, liver cirrhosis, brain damage*
Drug abuse	*AIDS, suicide, violence, accidents, hepatitis, infections, renal failure*
Blood lipid levels *—raised total cholesterol* *—raised low density lipoproteins* *—low high density lipoproteins*	*Coronary heart disease*
Poor diet and nutrition (e.g. increased salt levels or deficiencies in particular nutrients)	*Coronary heart disease, stroke, breast and digestive system cancers, diabetes mellitus, gallstones, osteoporosis, malnutrition, dental conditions*
Physical inactivity	*Coronary heart disease, stroke, diabetes mellitus, osteoporosis*
Overweight and obesity	*Coronary heart disease, breast cancer, diabetes mellitus*
Familial associations	*Breast cancer, congenital abnormalities, various diseases*
Contraceptive use	*Stroke, gallstones*
Reproductive history	*Breast cancer, gallstones*
Unprotected or indiscriminant sexual activity	*AIDS, cervical cancer, infertility, pelvic infection, venereal disease*
Driver skill, vehicle safety and road conditions	*Motor vehicle, bicycle and pedestrian accidents*
Social and psychological factors	*Suicide, accidents, poisonings and violence*
Hazardous natural environmental conditions (eg. sunlight exposure, air contaminants, natural disasters)	*Skin cancer, cataracts, accidents, asthma, allergies*
Hazardous built environmental conditions (e.g. workplace or home)	*Accidents, poisonings, violence, asthma, lung cancer, leukemia, chronic lung disease*

Box 2.7: Main features of the 1989–90 National Health Survey and the 1989 Risk Factor Prevalence Survey

	1989–90 NHS	*1989 RFPS*
Scope	*Australia wide*	*All capital cities*
Ages	*All ages*	*Ages 20 to 69 years*
Timing	*October 1989–September 1990*	*June–December 1989*
Sampling	*Multistage area sampling; probability sampling*	*From Commonwealth electoral roll, stratified by city*
Methods	*Personal interview* *No physical measurements* *Home setting*	*Self-reported questionnaire* *Physical examination* *Clinic setting*
Response	*About 54,600 respondents* *96 per cent response*	*About 9,300 respondents* *75 per cent response*

Source: *ABS 1991f*
RFPS Management Committee 1990

Figure 2.25: Average blood pressure by age group and sex, 1989



Source: RFPS Management Committee 1990

Refer to Appendix 1, Table A16

About 18 per cent of men and 14 per cent of women were found to be hypertensive (defined as being on tablets for blood pressure, and/or having a diastolic blood pressure (DBP) of 95 mmHg or more, and/or a systolic blood pressure (SBP) of 160 mmHg or more). The prevalence of hypertensives increased steadily with age. In the oldest age group, 65 to 69 years, 44 per cent of men and 52 per cent of women were hypertensive (Figure 2.26).

Of all hypertensives, 48 per cent of men and 69 per cent of women were taking tablets for raised blood pressure. Of those who reported they were on tablets for blood pressure, 43 per cent of men and 29 per cent of women did not have their blood pressure controlled (that is, measured systolic and/or diastolic blood pressure was higher than the levels noted above).

Blood cholesterol

From blood samples collected in the 1989 RFPS, average fasting plasma cholesterol levels were 5.4 mmol/L in men and 5.3 mmol/L in women not taking the oral contraceptive pill (the oral contraceptive pill can effect blood lipid levels). For people aged between 20 and 29 years and between 60 and 69 years, plasma cholesterol was lower in men than women, but for those aged between 35 and 49 years, it was higher for men than women (Figure 2.27).

Forty-seven per cent of men and 39 per cent of women had plasma cholesterol levels of 5.5 mmol/L or more, which is the level the National Heart Foundation (1987) regards as higher than desirable.

Preliminary analysis of average plasma cholesterol levels from the three RFPSs indicate that men experienced a decline of about 0.1 mmol/L during the 1980s, and women a decline of 0.2 mmol/L. The significance of these declines has not yet been assessed.

Overweight and obesity

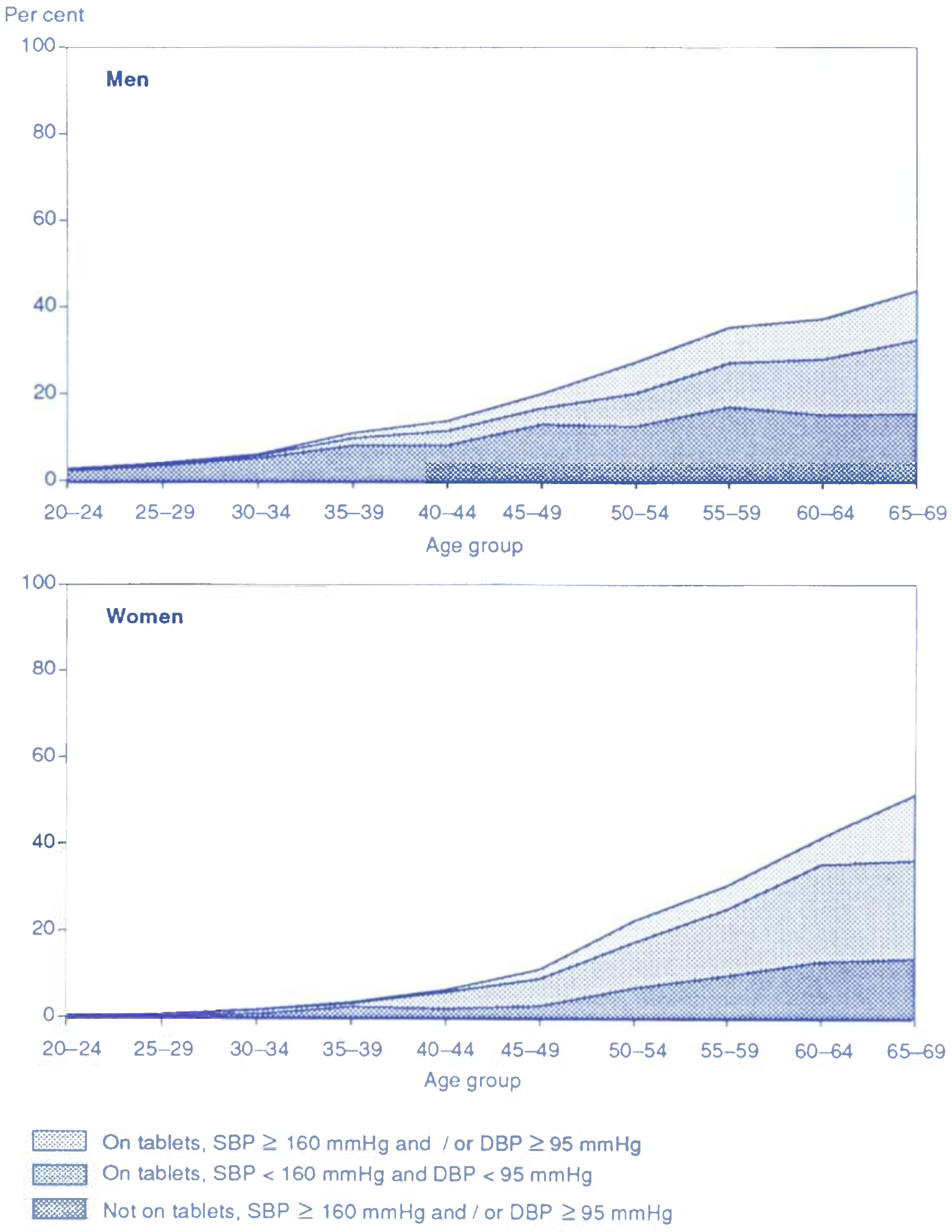
Based on height and weight measurements taken by the 1989 RFPS, almost 50 per cent of men and 35 per cent of women aged 20 to 69 years were overweight or obese (defined as body mass index (BMI) > 25 where BMI = weight (kg)/height $(m)^2$). The difference between men and women was found for all ages, but was greatest during the middle adult years (Figure 2.28). For those aged 45 years or more, about 60 per cent of men and 50 per cent of women were overweight or obese.

Overall, more women (11 per cent) than men (9 per cent) were obese, with the difference being greatest in the older age groups. A comparison of the 1983 and 1989 survey results indicate that there had been a significant increase in the prevalence of obesity in both men (22 per cent increase) and women (15 per cent increase) during that period.

The 1989 RFPS also found that almost 30 per cent of women aged between 20 and 24 years were underweight (defined as BMI < 20).

As noted above, the 1989–90 NHS did not measure height and weight, but relied on self-reported estimates. Based on this information, estimates of the prevalence of overweight or obese Australians aged 15 years or more (44 per cent of men and 31 per cent of women) were slightly lower than those from the 1989 RFPS, but show the same sex differential (ABS 1992b).

Figure 2.26: Hypertensives(a) by age group and sex, 1989

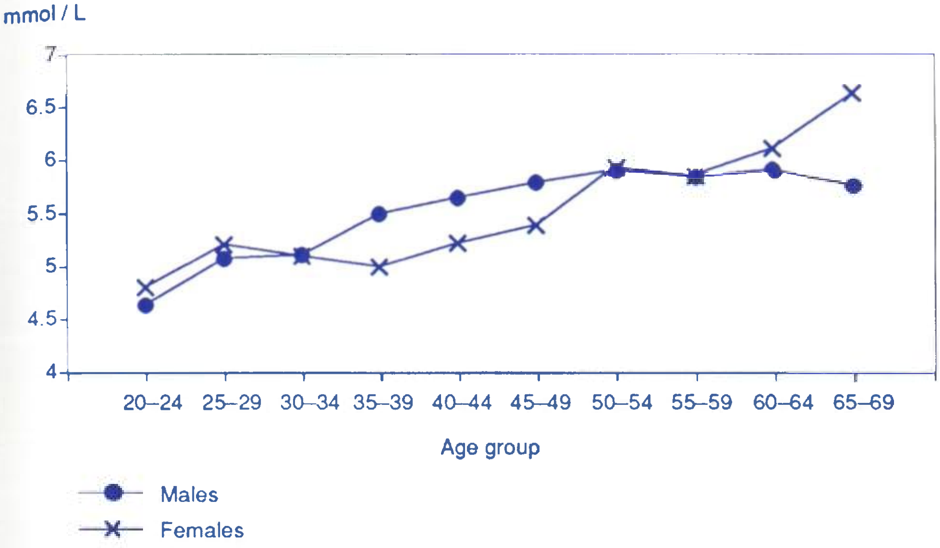


(a) On tablets, and / or SBP ≥ 160 mmHg and / or DBP ≥ 95 mmHg

Source: RFPS Management Committee 1990

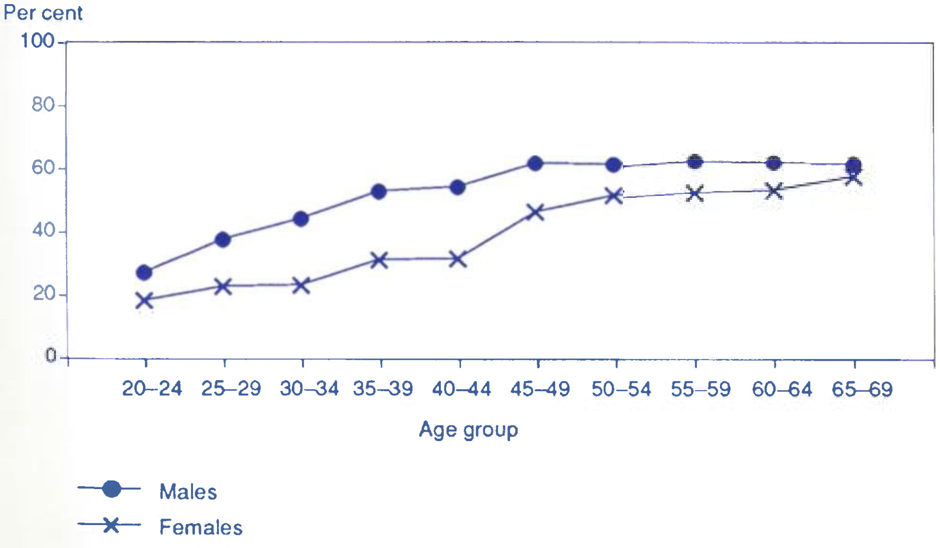
Refer to Appendix 1, Table A17

Figure 2.27: Average blood cholesterol by age group and sex, 1989



Source: RFPS Management Committee 1990 *Refer to Appendix 1, Table A18*

Figure 2.28: Proportion overweight or obese[(a)] by age group and sex, 1989



(a) Defined as body mass index > 25, where body mass index = weight (kg) / height $(m)^2$
Excludes 'not stated'.

Source: RFPS Management Committee 1990 *Refer to Appendix 1, Table A19*

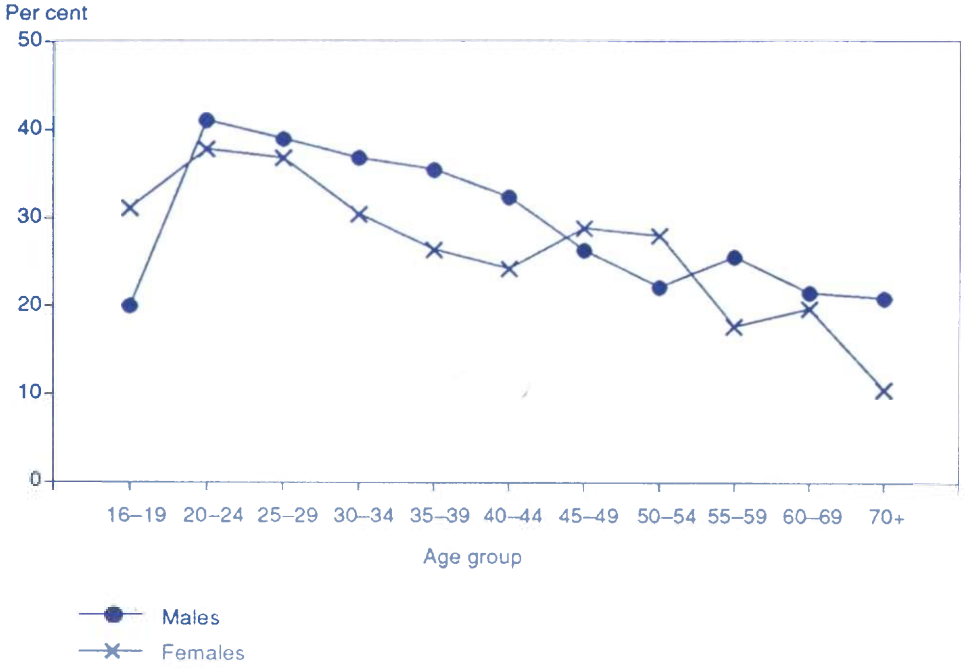
Smoking behaviour

The 1989–90 NHS estimated that 32 per cent of men and 25 per cent of women aged 18 years or over were current smokers. These figures represent marked declines in the prevalence of smokers compared with estimates from a survey of tobacco consumption patterns conducted in 1977 (ABS 1977) when 46 per cent of men and 29 per cent of women reported being smokers.

These observations are consistent with a recent detailed analysis of smoking behaviour, which estimated that in 1989 30 per cent of men and 27 per cent of women aged 16 years and over were current smokers (Hill, White, Gray 1991). Smoking was most common in the 20 to 24 year age group, for both men and women, but became progressively less common with increasing age (Figure 2.29). This strong decline in smoking prevalence with age was also shown in the 1989–90 NHS and the 1989 RFPS.

During the 1980s, the prevalence of smoking has been steadily falling, for both men and women (Figure 2.30). The decline since about 1983 has been attributed to the public response to the effort and expense put into smoking reduction programs (Hill, White, Gray 1991). Many strategies have been used, including mass media campaigns, individual efforts of doctors, other health professionals and teachers, legislation and regulation, and price increases.

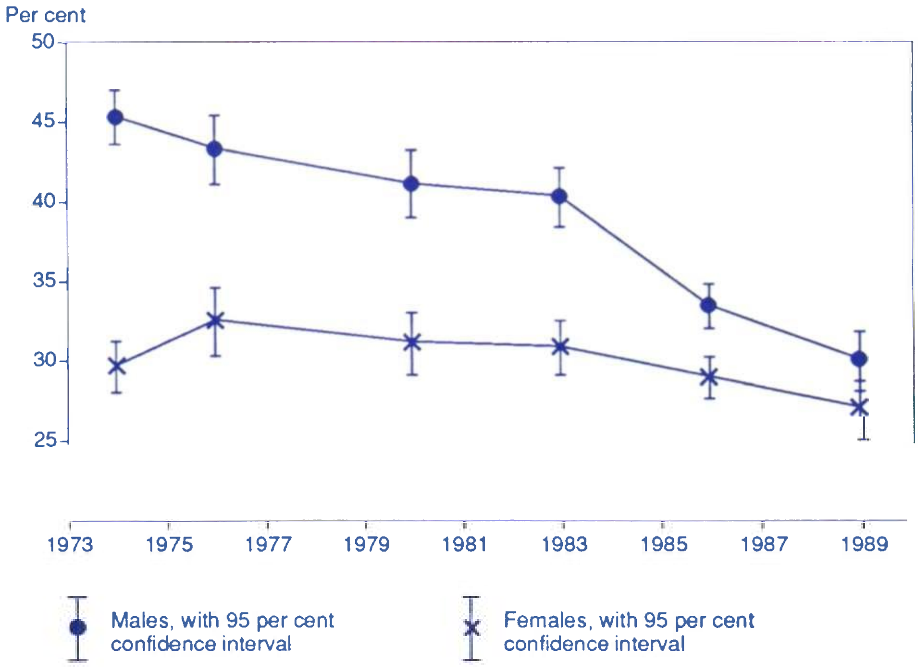
Figure 2.29: Current smokers by age group and sex, 1989



Source: Hill, White, Gray 1991

Refer to Appendix 1, Table A20

Figure 2.30: Smokers by sex and year of survey(a), 1974 to 1989



(a) Age standardised to 1986 sample.

Source: D. Hill, personal communication

Refer to Appendix 1, Table A22

Between 1986 and 1989, there were substantial reductions in estimated daily exposure to cigarette tar (10 per cent and 19 per cent reductions respectively for men and women smokers) (Hill, White, Gray 1991). Against these favourable trends, there is concern that larger packet sizes and associated price discounting may cause smokers to smoke more than they otherwise would.

Exercise for recreation, sport or fitness

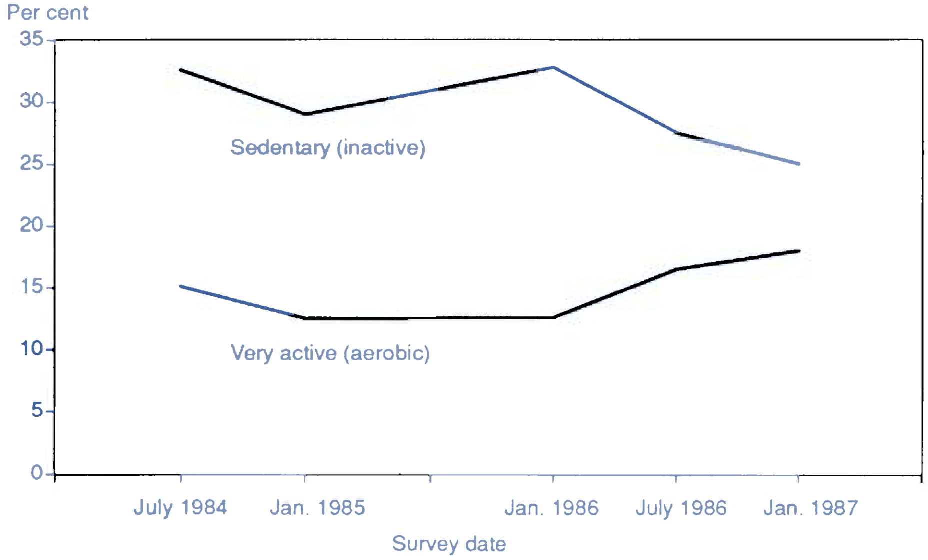
There are three sources of data on participation in leisure time exercise by Australians during the 1980s.

The 1989 RFPS asked people living in capital cities about their exercise for recreation, sport, or health and fitness during the preceding two weeks. About 27 per cent of men and women had taken no exercise of any kind during leisure time. They did not walk for recreation or exercise, or take part in more vigorous exercise of any kind. The information on exercise which has been published from the 1989–90 NHS reported that, Australia-wide, 36 per cent of people aged 18 years and over took no exercise for recreation, sport or fitness in the two weeks prior to interview.

Walking was the most popular form of exercise for respondents in the 1989 RFPS. Fifty-two per cent of men and 59 per cent of women said they had walked for recreation or exercise during the preceding two weeks. These estimates represent an increase of almost 6 per cent since 1983. Across all ages, 6 per cent of men and 4 per cent of women exercised regularly at a vigorous level (at least 3 sessions a week at an average of at least 20 minutes each session). This is the level of exercise commonly believed to confer a 'training effect' on the heart and lungs.

In the period 1984 and 1987, the Commonwealth Department of the Arts, Sport, the Environment, Tourism and Territories conducted national surveys of exercise participation. Over this period, there was a statistically significant decline in the proportion who reported being totally sedentary (Bauman, Owen, Rushworth 1990), from 33 per cent to 25 percent (Figure 2.31). There was a slight increase in the proportion of Australians who participated in regular physical activity.

Figure 2.31: Level of physical activity, 1984 to 1987



Source: Bauman, Owen, Rushworth 1990

Refer to Appendix 1, Table A21

Alcohol intake

In the 1989 RFPS, 87 per cent of men and 75 per cent of women reported that they drank alcohol. The proportion of drinkers was lower in the older age groups. Younger adults who drank did so more heavily than older adults, but they were likely to drink less frequently.

The 1989–90 NHS collected information on types and quantities of alcoholic drinks consumed on each of the seven days prior to interview. Almost 74 per cent of men and 52 per cent of women reported having an alcoholic drink during the week prior to interview (ABS 1991e). The average daily consumption of those who drank (23.6 mls of alcohol) was roughly equivalent to two 'standard' drinks (a 'standard' drink is defined as 285 mls of full strength beer, 30 mls of spirits, or 120 ml of wine). The average daily consumption by men (31.0 mls) was almost two and a half times that by women (13.2 mls).

Almost 10 per cent of male drinkers reported drinking at a level which put their health at high risk (greater than 75 mls of alcohol per day), as did 3 per cent of female drinkers (greater than 50 mls of alcohol per day).

Dietary behaviour

The 1989 RFPS data on dietary behaviour showed that 20 per cent of men and 27 per cent of women followed some kind of special diet. A fat-modified diet to lower blood fat was reported by 11 per cent of men and almost 13 per cent of women. For both sexes, the use of this diet increased with age, being around 20 per cent for men and 23 per cent for women at older ages. People were twice as likely to be on a fat-modified diet in 1989 than in 1983.

At all ages, men were more likely than women to add salt to their food after it was cooked. Overall, 49 per cent of men rarely or never added salt to their food, compared with 58 per cent of women. A preliminary comparison of these data with 1983 figures indicate a sharp reduction in the proportion of people who added salt to food after it was cooked.

ABS regularly produces estimates on the apparent consumption of foodstuffs and nutrients, based on production, import and export statistics. These estimates reveal a number of changes in the Australian diet over the 5 year period from 1983–84 to 1988–89 (ABS 1992a) (Figure 2.32).

The apparent per capita consumption of meat and meat products was fairly constant, although the consumption of veal and lamb decreased and that of pig meat increased. Per capita consumption of poultry increased by 24 per cent between 1983–84 and 1988–89, and seafood by 16 per cent.

The per capita consumption of dairy products showed a marginal increase overall. Cheese consumption in 1988–89 was 12 per cent greater than in 1983–84.

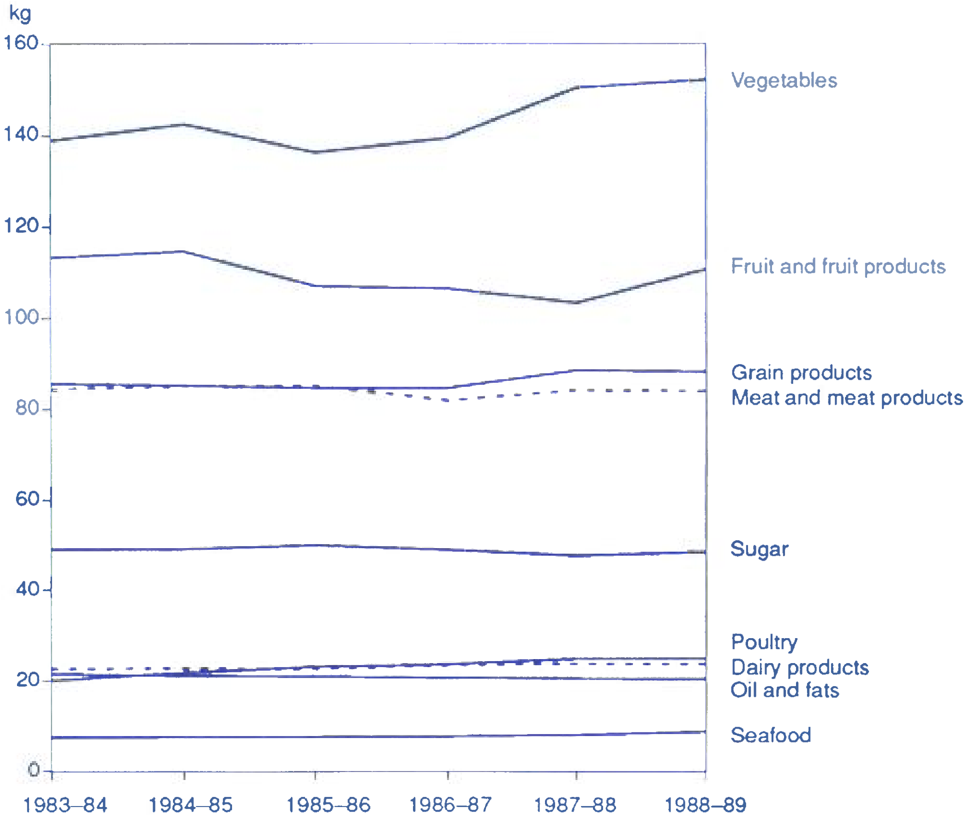
Per capita consumption of fruit and fruit products increased by 7 per cent between 1987–88 and 1988–89, prior to which consumption had fallen. Consumption of vegetables has generally been increasing, reflecting increased consumption of leafy and green vegetables (17 per cent) and tomatoes (13 per cent) since 1983–84. Consumption of grain products increased during the five-year period to 1988–89, reflecting increased consumption of table rice and breakfast foods.

Since 1983–84, consumption of eggs has declined steadily with a decrease of 12.3 per cent over the recent 5-year period (from 146 to 128 eggs per person). Consumption of oils and fats decreased by almost 6 per cent over the period, and butter consumption decreased by almost 21 per cent. The recent decrease in total fat consumption (from 21.5 to 20.3 kg per person) followed a net increase over the previous 45 years. In that period, a large decline in butter consumption (from 15 kg to about 4 kg per person) had been offset by increases in the consumption of margarine and vegetable oils and other fats.

Over the past 50 years, total sugar consumption has remained relatively constant, but there has been a marked shift from sugar consumed as refined sugar to sugar consumed in manufactured foods. As a proportion of total sugar consumption, sugar consumed in manufactured foods increased from 32 to 70 per cent.

Tea consumption has fallen by 20 per cent over the past five years and coffee consumption has remained fairly stable. Between 1987–88 and 1988–89, there was a 36 per cent increase in consumption of low alcohol beer. Consumption of other beer has shown a gradual decline over recent years, as has the consumption of wine.

Figure 2.32: Apparent per capita consumption of selected foodstuffs, 1983–84 to 1988–89



Source: Australian Bureau of Statistics 1992a

Immunisation status

The lack of immunisation is a risk factor for a number of communicable diseases, including diphtheria, tetanus, whooping cough, poliomyelitis, measles, mumps and rubella. Recommended immunisation schedules for these diseases have been produced by the NHMRC (1991), and completion of the schedule for a specific disease will normally provide immunity against that disease. For example, serological evidence of immunity has been demonstrated in 95 per cent of children receiving the measles immunisation and 97 per cent receiving the mumps immunisation (Kakakios et al. 1990) according to the NHMRC schedule (immunisation between 12 and 15 months of age).

The 1989–90 NHS included questions on immunisation covering:

- the immunisation status of children aged 0 to 6 years against diphtheria, tetanus, whooping cough and poliomyelitis
- the immunisation status of children aged 1 to 6 years against mumps and measles

- the immunisation status of women aged 15 to 44 years against rubella (German measles).

Children were classified as fully immunised, partly immunised or not immunised according to whether or not they had received the recommended immunisations appropriate to their age.

The proportion of children aged 0 to 6 years who were fully immunised against diphtheria and tetanus was 91 per cent for males and 90 per cent for females (Table 2.8). A further 5 per cent of males and 6 per cent of females were partly immunised. The proportions fully immunised against whooping cough were lower (73 per cent of males and 75 per cent of females), but a further 21 per cent of males and 20 per cent of females were partly immunised. Similarly, 76 per cent of males and 78 per cent of females were fully immunised against poliomyelitis, and 17 per cent of males and 16 per cent of females were partly immunised.

The proportion of children aged 1 to 6 years who were fully immunised against measles was 88 per cent for males and 89 per cent for females. The corresponding figures for mumps were 84 per cent for both males and females. The recommended vaccination for measles and mumps involves a single injection, so there were no children partly immunised.

Table 2.8: Immunisation status for selected diseases, children aged 6 years and under, 1989–1990

(Per cent)

Disease	*Males*	*Females*	*Persons*
Diphtheria / Tetanus[a]			
Fully immunised	91	90	90
Partly immunised	5	6	6
Not immunised	4	4	4
Whooping cough[a]			
Fully immunised	73	75	74
Partly immunised	21	20	20
Not immunised	6	5	6
Poliomyelitis[a]			
Fully immunised	76	78	77
Partly immunised	17	16	17
Not immunised	7	6	6
Measles[b]			
Fully immunised	88	89	89
Not immunised	12	11	11
Mumps[b]			
Fully immunised	84	84	84
Not immunised	16	16	16
Overall immunisation status[b]			
Fully or partly immunised	80	81	80
Not immunised	20	19	20

(a) Children aged 0 to 6 years.

(b) Children aged 1 to 6 years.

Source: AIHW, derived from ABS 1989–90 National Health Survey

An estimate of overall immunisation status can also be made according to the proportion of children aged 1 to 6 years who have been fully or partly immunised for all of the diseases listed above as appropriate for their age. From immunisation status reported in the 1989–90 NHS, 80 per cent of male children aged 1 to 6 years and 81 per cent of female children aged 1 to 6 years were fully or partly immunised (Table 2.8).

Rubella immunisation aims to ensure the immunity of women of child-bearing age, so that, if they become pregnant, they will not expose their fetus to rubella damage in utero. To achieve immunity, it is recommended that all females between the ages of 10 and 16 years be immunised against rubella (NHMRC 1991).

A rubella immunisation program was introduced throughout Australia during 1970–71. In the first year of the program, nearly all girls aged 12 to 14 years were immunised. Since then, most State and Territory health authorities have continued the program. The 1989–90 NHS estimates reflect this, with the proportion of immunised younger women ranging from 94 per cent (for those aged 15 to 19 years) to 84 per cent (for those aged 30 to 34 years) (Table 2.9). Of women aged 35 to 39 years, the proportion immunised was 63 per cent, and only 51 per cent of women aged 40 to 44 years had been immunised.

Overall, 81 per cent of women aged 15 to 44 years had been immunised against rubella. In addition, a further 9 per cent reported having previously had rubella or having had immunity confirmed by a blood test. Despite the high levels of immunisation in the age groups with highest fertility, the occasional case of congenital rubella syndrome still occurs.

Table 2.9: Rubella immunisation status, females by age group, 1989–1990

(Per cent)

Age group (years)	*Received immunisation*	*Already immune*	*Unprotected*
15–19	94	2	5
20–24	94	2	5
25–29	92	3	5
30–34	84	8	8
35–39	63	22	14
40–44	51	19	30
All ages	**81**	**9**	**11**

Source: AIHW, derived from ABS 1989–90 National Health Survey

Use of sunscreens

Protection against some of the adverse health effects of the sun's ultraviolet (UV) radiation (see 'Factors influencing health', page 16) can be achieved by the use of protective clothing or, where this is impractical, an SPF (sun protection factor) 15+ broad spectrum sunscreen (Australian Cancer Society 1987).

Data from the 1989–90 NHS suggest that 52 per cent of Australian men and 40 per cent of Australian women do not adequately protect themselves from UV radiation with sunscreens or protective clothing (Table 2.10). Only 23 per cent of children aged under 15 years were inadequately protected, but the proportion was higher among adolescents and adults—49 per cent for people aged 15 to 19 years, and 51 per cent for those aged 20 to 24 years. The proportion with inadequate protection fell with age for younger adults to 46 per cent for people aged 35 to 39 years, but rose with age for older people, reaching 59 per cent for people aged 60 to 64 years and 58 per cent for people aged 65 years or over.

A 1986–1987 study of the use of sun-protection measures among 10 to 18 year olds in New South Wales found that 62 per cent of males and 77 per cent of females did not use adequate sun protection methods (Cockburn et al. 1989). Corresponding estimates from the 1989–90 NHS were 58 per cent for males and 46 per cent for females. Some of the differences may be due to methodological differences between the studies, but the results suggest that the use of sun-protection measures by females in this age group has risen since 1986–1987.

Table 2.10: Adequacy of protection from ultraviolet radiation(a), proportions by age group and sex, 1989–1990

(Per cent)

	Adequately protected			*Inadequately protected*		
Age group (years)	*Males*	*Females*	*Persons*	*Males*	*Females*	*Persons*
Under 15	74	79	77	26	21	23
15 to 19	46	57	51	54	43	49
20 to 24	42	57	49	58	43	51
25 to 29	42	57	50	58	43	50
30 to 34	46	61	54	54	39	46
35 to 39	45	62	54	55	38	46
40 to 44	42	59	50	58	41	50
45 to 49	37	55	45	63	45	55
50 to 54	34	51	42	66	49	58
55 to 59	37	48	42	63	52	58
60 to 64	35	47	41	65	53	59
65 and over	36	47	42	64	53	58
All ages	48	60	54	52	40	46

(a) By use of sunscreens or protective clothing.

Source: AIHW, derived from ABS 1989–90 National Health Survey

2.6 Selected health topics

The main purpose of this report is to present an overall picture of health and health services in Australia, and it is beyond its scope to examine a wide range of specific issues. However, this section considers briefly five topical aspects.

Lung cancer, a largely preventable disease, is the major cause of cancer deaths of males, and is responsible for an increasing number of deaths of females. The following section reviews trends in lung cancer mortality, and considers the differences between different segments of society in awareness of and exposure to the risks of smoking. The next two sections summarise data and recent developments in programs for two female cancers—breast and cervical cancer. Recent trends in the incidence and mortality of AIDS are presented after that.

The final section focuses on an innovative new data collection, which is proving valuable in the planning of injury intervention strategies and in intervention monitoring. Its use is examined in relation to head injuries to cyclists, a public health issue to which Australian governments have responded in recent years with the introduction of legislation requiring the wearing of protective helmets.

Lung cancer

Of cancers, lung cancer ranks first for males and third for females in terms both of incidence and mortality (see 'Cancer', page 52). However, while the death rate for males has fallen slightly over recent years (Holman 1991), the rate for females is still rising. For males, reductions in death rates have occurred for most age groups, but were proportionately larger for younger age groups. In contrast, the age-specific death rates for women continue to rise. The differential declines in age-specific death rates for males and the increasing rates for females reflect differences in the lifetime smoking experience of men and women born at different times.

The genesis of these recent observations was recognised as long ago as 1966, when the number of lung cancer deaths was increasing rapidly. At that time, it was noted that lung cancer death rates in England and Wales were still increasing rapidly in most age and sex groups, but they were no longer doing so for young men (Springett 1966). Grouping of mortality data according to year of birth had revealed that, for men, lung cancer mortality increased up to the year of birth 1911. Among men born after that time, there was no further increase. For women, the increase was continuing.

The most recent Australian data illustrate this phenomenon very clearly (Figures 2.33 and 2.34). For men born between 1873 and 1903, there was a progressive increase in lung cancer mortality between successive birth cohorts (see Box 2.8). For men born after 1903, there is a remarkably constant mortality, with the suggestion of a slight decrease in mortality for men born since 1933. It is reasonable to anticipate that this last trend will continue and that, as these men pass 60 years of age, they will experience less lung cancer than did their predecessors.

For Australian women, the prospects are very different. The increases in lung cancer have continued at least until the birth cohort of 1928. There is some suggestion that mortality may be beginning to stabilise in later birth cohorts, but even this is not certain.

These changes illustrate the long lag period between changes in smoking habits and in consequent lung cancer mortality. Men took up smoking before women did and, over recent years, many more men than women have quit smoking (Figure 2.30, page 71).

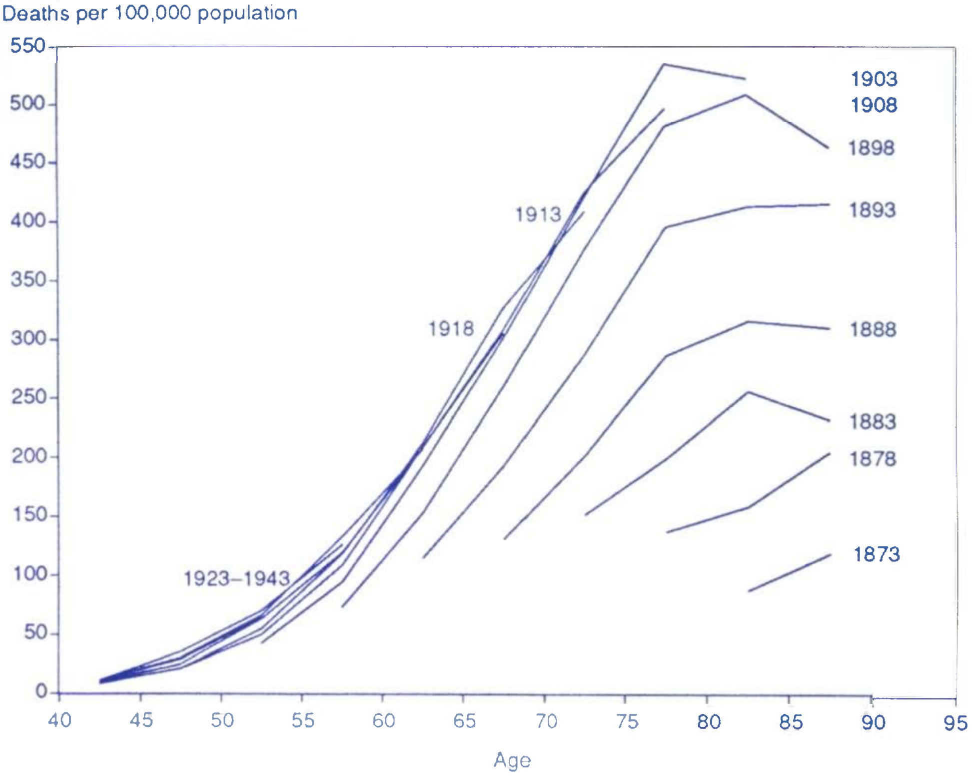
Awareness of the harm caused by smoking, including its contribution to the development of lung cancer, is not yet universal. A tenth of Australian 'lower blue collar' workers aged 16 years or older reported they were unaware of any illnesses caused by smoking, compared with 5 per cent of 'upper white collar' workers (Hill 1991). Eleven per cent of those with 9 or less years education reported being unaware of any illnesses caused by smoking, compared with only 4 per cent of those with 12 or more years education

Generally, this awareness is reflected in practice—the reductions in smoking since 1980 have been greatest among the better informed sections of the community (Table 2.11). As a result, the relative prevalence of smoking in 'lower blue collar' men compared with 'upper white collar' men has increased from 57 per cent higher in 1980 to 115 per cent higher in 1989.

In aiming towards equity in risk of developing lung cancer, Australia has targeted a prevalence difference of 10 per cent or less by the year 2000 (HTIC 1988). However, the widening differentials in the prevalence of smoking make the achievement of this target unlikely.

An important task for the campaigns against smoking is to achieve in the less well-informed sectors of the community the reductions in smoking that are well under way in better informed sectors. Even after that has been achieved, the long lag period between changes in smoking habits and death from lung cancer will mean that lung cancer will remain an important cause of death for many years.

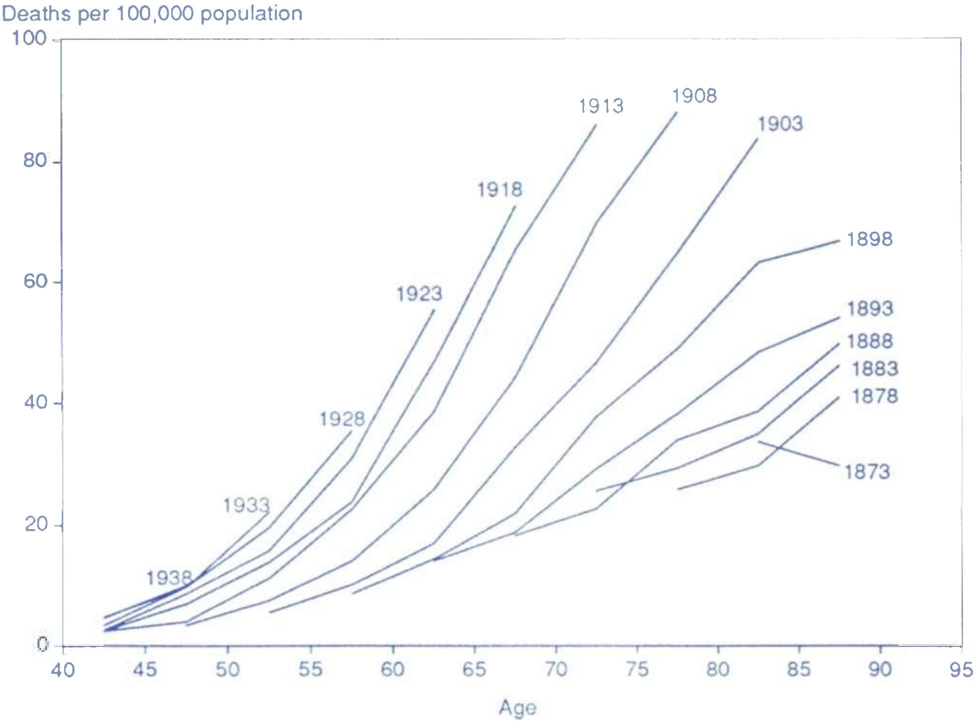
Figure 2.33: Lung cancer, males, age-specific death rates 1953 to 1987, by median year of birth[(a)]



(a) Five year age cohorts, 1868 to 1943. See Box 2.8

Source: National Cancer Statistics Clearing House (unpublished)

Figure 2.34: Lung cancer, females, age-specific death rates 1953 to 1987, by median year of birth[(a)]



(a) Five year age cohorts, 1868 to 1943. See Box 2.8

Source: National Cancer Statistics Clearing House (unpublished)

Box 2.8: Mortality in birth cohorts

Figure 2.2 (page 26) is an example of a graph showing trends over time in mortality for specific age groups.

Another way of analysing trends in mortality, which is particularly useful when examining the effects of lifetime exposure to risk factors, is to study mortality in birth cohorts. A birth cohort is all persons born in a specified time period. The cohort is then followed throughout its life. For example, a person born on 1 January 1903 would, if still alive, have turned 50 years on 1 January 1953, 55 on 1 January 1958, and so on. That person would have been aged 50 to 54 years from 1953 to 1957, and 55 to 59 years from 1958 to 1962.

The mortality of persons born in the 5 years centred on 1 January 1903 (that is, from 1 July 1900 to 30 June 1905) can be represented quite accurately by mortality at age 50 to 54 years from 1953 to 1957, 55 to 59 years from 1958 to 1962, and so on up to mortality at age 80 to 84 years from 1983 to 1987.

This has been done in Figure 2.34, where the death rates of this cohort from 50 to 54 through to 80 to 84 years are marked '1903' to denote the central year of birth.

Table 2.11: Smokers by occupation, educational attainment and sex, 1980 and 1989

(Per cent)

	Males		*Females*	
Occupation / Educational attainment	*1980*	*1989*	*1980*	*1989*
Occupation				
Lower blue collar	**47**	43	**30**	**31**
Upper blue collar	**45**	32	**32**	28
Lower white collar	**36**	27	**29**	26
Upper white collar	**30**	20	**31**	22
Educational attainment				
9 years or less	**44**	35	**31**	28
10 or 11 years	**41**	37	**32**	29
12 years or more				
Not a graduate	**31**	26	**27**	26
Graduate	31	21	27	20

Source: Hill, Gray 1984
Hill, White, Gray 1991

Breast cancer

It is over 20 years since breast cancer mortality was shown to be influenced by treatment following breast screening X-rays in apparently well women (Shapiro, Strax, Venet 1971), but specific recommendations for such screening (known as mammography) in the early detection of cancer of the breast have been formulated only relatively recently in Australia.

From 1988 to 1990, an AHMAC Committee considered requirements for an effective breast cancer screening program. The Committee examined evidence from countries with organised mammography screening programs, and also monitored pilot screening programs in several urban and rural locations throughout Australia, testing recruitment and operational strategies.

Based on the findings of overseas studies, the Committee recommended 'vigorous promotion' of screening programs for women aged 50 to 69 years (AHMAC 1990). For women in this age group, regular mammographic screening should reduce their risk of death from breast cancer by up to 60 per cent. The impact of screening on breast cancer mortality reduction for women aged 40 to 49 years is less well established, and screening is not cost-effective before 40 years. As a result, the Committee concluded that screening should be made available and publicised for women aged 40 years and above, but that recruitment strategies should be targeted at women aged 50 years and above. It was estimated that, after allowing for deaths among women who are not targeted or do not participate in screening, such a program could reduce mortality from breast cancer among all Australian women by approximately 16 per cent.

Data from the 1989–90 NHS reveal that only 22 per cent of women aged 40 to 64 years had had a mammogram in the previous three years (Table 2.12). The highest proportion having had a mammogram, 25 per cent, occurred among women aged 45 to 49 years. Thereafter, the proportion decreased with age, falling from 24 per cent of those aged 50 to 54 years to 17 per cent of those aged 60 to 64 years. Of women aged 40 to 44 years, 22 per cent had had a mammogram (Table 2.12).

Table 2.12: Proportion of women who have had a mammogram or a Pap smear[a] in the previous three years, 1989–90

(Per cent)

Age group (years)	*Mammogram*	*Pap smear*
18 to 24	na	61
25 to 34	na	85
35 to 39	na	80
40 to 44	22	75
45 to 49	25	73
50 to 54	24	64
55 to 59	20	55
60 to 64	17	45
All ages[b]	22	72

(a) Excludes women who had a hysterectomy.

(b) Ages 40 to 64 years for mammograms and ages 18 to 64 years for Papanicolaou smears.

Source: AIHW, derived from ABS 1989–90 National Health Survey

One reason why women might not participate in screening is that they do not know about it. Data from the 1989–90 NHS reveal that, among women aged 50 to 64 years, awareness of mammography is very much lower among women who do not speak English in the home than among women who do (Table 2.13). As well as this major effect, awareness of mammography is influenced by education level, family income and place of residence. For both women who speak English at home and women who do not, awareness is higher among those with higher income, higher levels of education and who reside in a metropolitan rather than non-metropolitan area.

Table 2.13: Women aged 50 to 64 who had never heard of mammography, by language, income, education and place of residence[a], 1989–1990

(Per cent)

	Language spoken at home	
	English	*Other than English*
Family income level		
First quintile	4	34
Second quintile	8	34
Third quintile	10	31
Fourth quintile	12	37
Fifth quintile	14	40
Education level		
High	5	20
Medium	11	36
Low	14	42
Place of residence		
Metropolitan	10	36
Non-metropolitan	11	39
Total	10	36

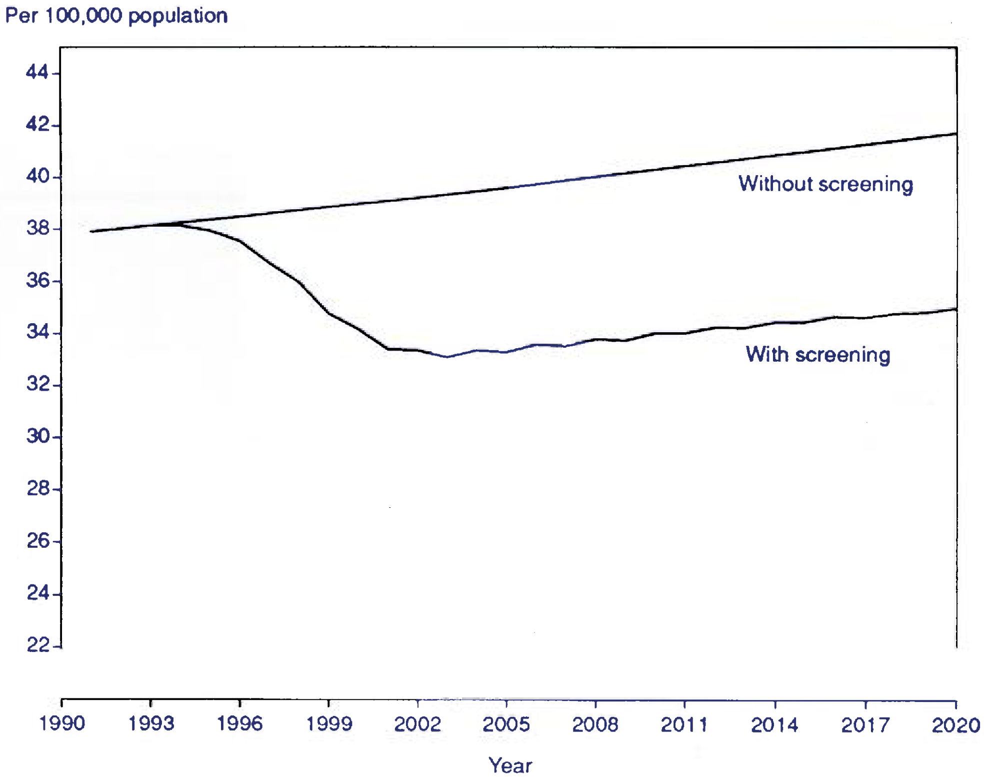
(a) Age-standardised to the 1988 Australian female population.

Source: AIHW, derived from ABS 1989–90 National Health Survey

Since the AHMAC Committee presented its report, governments have been organising screening programs. The impact of the screening programs will ultimately be measured by their effect on existing trends in mortality, so it is useful to examine projected trends in mortality from breast cancer, both in the presence and absence of such screening programs. These projected trends in mortality, based on population projections made by ABS and on the Committee's description of how a mammography screening program would operate in Australia, have been made for the 30 year period from 1991 to 2020 (AIHW unpublished).

In Australia, breast cancer mortality has increased only slightly in recent years, from 25.0 deaths per 100,000 women per year in 1971–1975 to 26.2 in 1986–1990. Assuming no advances in the treatment of breast cancer or reduction in risk factors, projections show that for a program which commenced in 1991 there would be no measurable reduction in mortality before 1995. The reduction in mortality would remain at less than 10 per cent till the year 1999 (Figure 2.35). By the year 2005, the reduction in mortality would be approximately 16 per cent. This reduction in breast cancer mortality is somewhat lower than the 25 per cent reduction that had been targeted by the National Better Health Program.

Figure 2.35: Breast cancer, predicted death rates with and without screening, 1991 to 2020[(a)]



(a) Assumes 70 per cent compliance. Rates standardised to 1988 Australian population.

Source: Australian Institute of Health and Welfare

Refer to Appendix 1, Table A23

Cervical cancer

In contrast to the quite recent clarification of the role of mammography in screening for breast cancer, the role of the Papanicolaou smear in the detection of potentially cancerous conditions of the uterine cervix has been well established for many years. Appropriate treatment following an abnormal smear can prevent most invasive cervical cancer. The risk of developing and dying from cervical cancer is influenced by a number of risk factors (including sexual history, infection with human papilloma virus and smoking habits) and by screening for the disease. The combined effect of these factors has varied from one generation of Australian women to another.

Except for younger ages, where there have been some increases, cervical cancer mortality in Australia has been decreasing for the last 20 years. During the 1970s, the standardised death rate declined from 5.3 to 3.7 deaths per 1,000 women (4.1 per cent per year). Since then, the rate of decline has been somewhat less, from 3.7 to 3.1 per 1,000 (1.6 per cent per year). Changes in risk factor levels may have influenced the size of these changes at different ages. However, it is clear that widespread acceptance of the Papanicolaou smear has been primarily responsible for the reductions in mortality. While 700 to 750 cases of cervical cancer are prevented each year in Australia, it has been estimated that at least a further 700 cases could be prevented with a more organised approach to screening, and that the majority of women who develop invasive cervical cancer are inadequately or never screened (AHMAC 1991).

Evidence from countries with organised screening programs suggests that up to 90 per cent of squamous cell cancer of the cervix (80 to 85 per cent of all forms of cervical cancer) can be prevented. Both the WHO and the International Agency for Research on Cancer have made recommendations about the requirements for an effective cervical cancer screening program (Hakama, Miller, Day 1986).

The major barrier to reduction in cervical cancer mortality is incomplete coverage of screening. The 1989–90 NHS estimated that, after excluding women with a hysterectomy, 72 per cent of Australian women aged 18 to 64 had had a Papanicolaou smear in the previous three years (Table 2.12). However, the risk of cervical cancer increases with age and most smears are taken from younger women who are at lower risk. According to the 1989–90 NHS data, the proportion of women who had a Papanicolaou smear in the previous three years was 61 per cent for women aged 24 years or less, 85 per cent for women aged 25 to 34 years, but only 45 per cent for women aged 60 to 64 years.

As is the case with breast cancer screening, Papanicolaou smear coverage is lowest in the less educated sectors of the community. For example, the proportion of women reporting to the 1989–90 NHS that they had had a smear test in the previous three years was 73 per cent for those with least education compared with 86 and 88 per cent for those in the two groups with more education.

In parallel with the work undertaken on breast cancer screening, another AHMAC Committee examined suitable strategies for cervical cancer screening in Australia (AHMAC 1991). The Committee's recommendations provide the basis for the development of government-organised screening programs. As with breast cancer, the impact of the cervical cancer screening programs will ultimately be measured by their effect on existing trends in mortality.

Health targets relating to cervical cancer were first set by the Australian Cancer Society and adopted by governments in 1988 (HTIC 1988). The targets for triennial participation in screening were 50 per cent by 1990, 75 per cent by 1995, and 'all but a negligible number' by 2000; however, the 1995 target had been passed by 1990.

Achievement of this overall target does not ensure that screening among women in high risk groups (for example, older or less educated women) has reached satisfactory levels. A second target was to reduce mortality from cervical cancer by more than 30 per cent between the base year 1988 and the year 2000. Achievement of that target will require an annual reduction of 2.2 per cent per year, somewhat higher than the rate of reduction achieved over the last decade or so.

AIDS

In 1990, it was noted that the AIDS epidemic in Australia was made up of sub-epidemics in largely separate risk groups, and that, at least in homosexual and bisexual men, the number of new cases of end-stage AIDS was no longer increasing rapidly (AIH 1990). Later data, compiled by the National Centre in HIV Epidemiology and Clinical Research, confirm this for homosexual and bisexual men, among whom 89 per cent of all cases of AIDS in Australia had occurred to the end of 1991. The data also suggest that the peak of AIDS cases has passed in others who became infected with human immunodeficiency virus (HIV) by transfusion of blood or blood products, except in those with hemophilia, for whom the peak may not have been reached (Table S38, page 337). Infections through intravenous drug use and from heterosexual activity were generally acquired later than those mentioned above. In these two exposure categories, numbers of AIDS cases are small, but rising slightly.

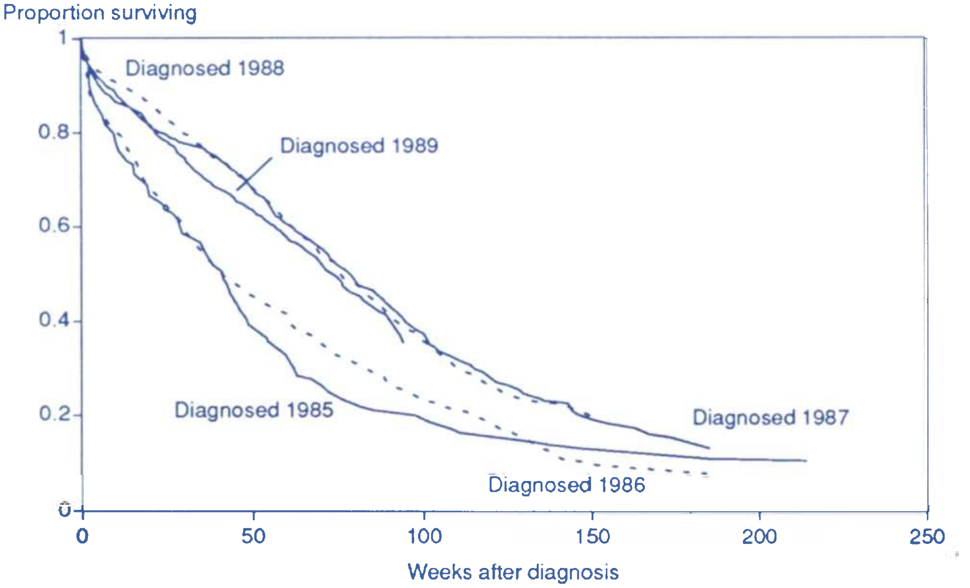
The features of the sub-epidemics reflect a complex of factors affecting individual exposure groups. For most groups, there have been reductions in new infection rates. For homosexual and bisexual men, there was a major change in sexual behaviour in late 1985. As well, since the introduction in 1985 of effective screening measures in the blood supply, there have been no new infections with HIV from blood or blood products. However, the great variability in the incubation period means that, for all exposure categories, new cases of AIDS will continue to develop for some years.

Continuing efforts by the National Centre in HIV Epidemiology and Clinical Research, assisted by work at the Institute in the detection of cases not notified and of deaths among cases which had been notified (Donovan 1991), have enabled more reliable statistics of survival to be compiled. The introduction in early 1987 of azidothymidine (AZT) treatment for AIDS increased survival time of patients with end-stage disease (AIH 1990). Since then, the drug has been used at successively earlier stages of the disease. This has deferred the onset of end-stage AIDS but recently there has been some decrease in survival in that stage of the illness (Kaldor et al. 1992). For homosexual and bisexual men with diagnosis of end-stage AIDS from mid-1989, survival from that stage was quite not as good as it had been in the previous two years (Figure 2.36).

The National Centre in HIV Epidemiology and Clinical Research also collects information on the numbers of persons diagnosed with HIV infections. The information in the national HIV database has recently been scrutinised very carefully to reduce duplicate notifications. Although it is believed that some duplication remains, the revised count of 15,679 total diagnoses of HIV infection in Australia up to 31 December 1991 is consistent with earlier estimates of around 15,000 infections.

There is, however, no room for complacency. New diagnoses of HIV infections continue to be reported—1,284 in 1991. Many of these persons would have been infected some years before. However, some of these infections were in persons who had previously been tested for HIV antibody, with negative results. There is thus evidence that new infections continue to occur, particularly among young men who report homosexual contact (National Centre for HIV Epidemiology and Clinical Research 1991). New infections are occurring also in other exposure categories, but homosexual men are more likely than others to have had previous tests for infection, so that the opportunity to demonstrate that an infection is new is more likely to be present in this group. Also, the comparatively minor first manifestation of HIV infection is more likely to be diagnosed in those known to be at high risk.

Figure 2.36: Survival of homosexual / bisexual men with AIDS, from time of diagnosis



Source: National Centre in HIV Epidemiology and Clinical Research (unpublished)

Injuries to cyclists—the role of injury surveillance

Injuries sustained by cyclists remain a problem in Australia and account for a significant number of deaths each year. As well, many non-fatal cycle-related injuries cause permanent disability, resulting in the need for lifetime institutional care or other support.

In recent years, between 60 and 65 males and 10 to 20 females have died each year from motor vehicle-related bicycle accidents. Between 1964 and 1987, age-standardised motor vehicle-related cyclist death rates for males declined substantially, but no trend was apparent for females. The falling rate for males is partly attributable to fewer older cyclists being killed in more recent years, probably reflecting changing modes of transport in older males. Cyclist fatalities not involving motor vehicles are fewer in number than motor vehicle-related fatalities (around 10 to 15 persons each year), and the number has remained stable for both sexes for many years.

Head injuries are sustained in a large proportion of cyclist fatalities, and young people are prominent in bicycle deaths. In the twelve months to November 1991, cyclists accounted for 3 per cent of all road deaths, and more than 39 per cent of cyclist fatalities were people aged 5 to 16 years (Federal Office of Road Safety 1991a).

However, deaths and morbidity data alone cannot provide much insight into the circumstances of cyclist injury. The Injury Surveillance Information System (ISIS), operated by 12 regional groups capturing data from about 50 hospital emergency departments from all States and the Australian Capital Territory, can provide additional data concerning pre-injury circumstances, the nature of injuries sustained, and outcomes. These data are collected for all people treated in the emergency departments, not just those admitted to hospital.

Unlike deaths and morbidity data, which focus on the injury event, ISIS has a range and richness of data items allowing diverse forms of analysis. For example, ISIS data allow examination of the pre-event context of injury events, the development of case characterisations, the identification of specific issues (such as malfunctioning equipment) and hypothesis generation, all of which are important in the development of specific countermeasures. For cyclists, ISIS data show that typically, the injured person is male and aged between 5 and 14 years, is injured between 3.00 p.m. and 6.00 p.m. during weekdays (or afternoons on weekends), and loses control of the bicycle while travelling on a public road. The range of information collected by ISIS is essential for the development of appropriate injury prevention programs, for priority setting, and for monitoring specific interventions.

In contrast to other data sources, ISIS data contain the conceptual elements required by the Haddon matrix model, found by a number of researchers to be a useful organising framework when analysing injuries. The Haddon matrix is a way of examining injuries in terms of the injury phase (pre-event, event, and post-event) and other elements of the event (for example, cyclists, cycle, physical environment and socioeconomic environment). It provides a focused structure for planning interventions. Recently, Childsafe NSW has used the model with ISIS data on injuries to cyclists to identify a number of possible countermeasures, and demonstrate that, while compulsory helmet wearing will result in a decline in cyclist deaths and head injuries, many other factors can assist in preventing the circumstances in which injury occurs (Carey 1991).

In addition to providing a detailed profile of cyclist injury patterns, ISIS data have the potential for use in the monitoring of injury intervention programs, including the early identification of trends and patterns following an intervention.

An important example of the use of ISIS data for intervention monitoring comes from Victoria, which, in July 1990, was the first State to introduce legislation for compulsory wearing of bicycle helmets. Legislation has since been developed in most other States and Territories.

The Victorian Injury Surveillance System (VISS) is using ISIS data obtained from three major hospitals in Melbourne to assess the impact of the legislation requiring helmet wearing. The data for the three hospitals cover at least a full year prior to the introduction of the helmet legislation. Data ascertainment rates at these hospitals exceed 90 per cent, and reach 100 per cent for cases admitted.

For cyclists under 15 years of age, the number presenting to these hospitals with a head injury was 40 per cent less in the year following the introduction of compulsory helmet legislation than in the year prior to its introduction (Victorian Injury Surveillance System 1991). For the same periods, the overall number of children presenting with any cycle-related injury declined by 26 per cent. Explanations offered for the overall reduction in presentations include a discouraging effect of the law on the use of bicycles, the fact that helmet use may have protected the heads of a greater proportion of cyclists and made cyclists more noticeable, and more careful riding habits stimulated by associated publicity were being practised (Ozanne-Smith, Sherry 1990).

Victoria's initiatives on helmet legislation, together with the ongoing monitoring of outcomes by VISS, have attracted considerable interest from a number of countries contemplating similar action. Indeed, WHO is currently developing an international strategy for bicycle helmet wearing, and the Australian experience, including the Victorian ISIS results, will be an important component in the development of this project.

VISS is also using ISIS data to monitor a trial of footpath cycling in two municipalities in Victoria, where, as in some other jurisdictions, cycling is prohibited on footpaths. One of the two municipalities is also involved in a community-based injury reduction project, in which road injury is one of many issues being addressed. Evaluation of the three year project, which commenced in December 1990, will include comparison of ISIS injury data for children within the municipality with baseline data for the three previous years.

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3 Health care funding, resources and utilisation

3.1 Health expenditure

Health expenditure statistics enable assessment of the volume and proportion of economic resources allocated to the production and consumption of health services. In addition to illustrating total health resource use—at a point in time, as well as over time—expenditure statistics can also be used to show the cost of various components of health services and the sources from which they are funded. Absolute dollar expenditures are significant for current accounting and budgeting purposes, but they are of limited use in analysing trends in the provision and utilisation of health services, because they may be heavily influenced by non-health factors such as general inflation and population growth.

The most interesting questions about health expenditure relate to its share of the total economic resources, its growth over time, and how a country's performance in these respects compares with other countries. The measures used for these purposes are health expenditure as a proportion of gross domestic product (GDP) and real (corrected for inflation) health expenditure per head of population (per capita). Neither is totally satisfactory for all purposes.

For long-term and international comparisons, the proportion of GDP is the best single indicator. However, over short periods, it is subject to fluctuations due to irregularities in the growth of GDP. Even over longer periods, international comparisons of health resources may be distorted by widely differing rates of GDP growth. Also, with differing use of health services by people of different age groups, both measures are influenced by differences in the age structures of the countries being compared.

For short-term comparisons, real health expenditure per capita may be a more useful measure than health expenditure as a proportion of GDP, but, over longer periods and in international comparisons, there are technical and conceptual difficulties with the choice and calculation of appropriate inflators and deflators (statistical techniques used to correct dollar expenditures to provide an estimate of 'real' amounts).

For planning and budgetary purposes, the composition of expenditures (with respect to the share of expenditure allocated to different services and to the source of expenditure) are of particular interest. The service breakdown is undertaken in accordance with WHO conventions, which may be clear in theory but are difficult to apply consistently in practice. These difficulties are particularly problematical in making international comparisons.

The main division of funding source is between the public and private sectors. This distinction is blurred (in some countries more than in others) by non-government organisations that perform quasi-government functions, and by the treatment of health expenditures for which tax deductions can be claimed. (Tax deductibility of private health care spending effectively shifts part of the funding of this expenditure from the private to the public sector.) In Australia, the relative contributions of Commonwealth and State and Territory governments are of considerable policy interest, but public accounting conventions do not always reflect the underlying reality.

The purpose of citing these complications is not to discount the value of health expenditure statistics. They can generate valuable insights. However, health expenditure statistics need to be interpreted in the context of the specific institutional arrangements of each country.

In the following sections, attention is directed to:

- overall levels of health expenditure, expenditures by the various components of health care system and the sources of the funds;
- a number of factors contributing to changes in health expenditure;
- the effect of population age structure on health expenditure; and
- possible future movements in health expenditure in Australia.

Health expenditure in Australia

In 1990–91, health expenditure by Australian governments and individuals was $30.9 billion, an average of almost $1,800 per person (Table S42, page 339 and Table S45, page 341). This expenditure represents 8.1 per cent of gross domestic product (GDP), a slight increase from recent years, but still of much the same magnitude as expended through the 1980s (Table S43, page 340).

Of the funds expended on health, governments provided $21.4 billion—the Commonwealth Government providing $13.3 billion and State and Territory and local governments $8.1 billion (Figure 3.1 and Table S48, page 343). The private sector provided $9.5 billion.

Since 1984–85, the proportion of total expenditure funded by governments has declined slightly, from 71 per cent to 69 per cent, with the private sector proportion rising correspondingly from 29 to 31 per cent (Table S48, page 343). The slight decline in the proportion of health expenditure funds provided by governments results from a combination of a fall in Commonwealth funding from 47 to 43 per cent of total expenditure, and a rise in State and Territory and local government funding from 25 to 26 per cent.

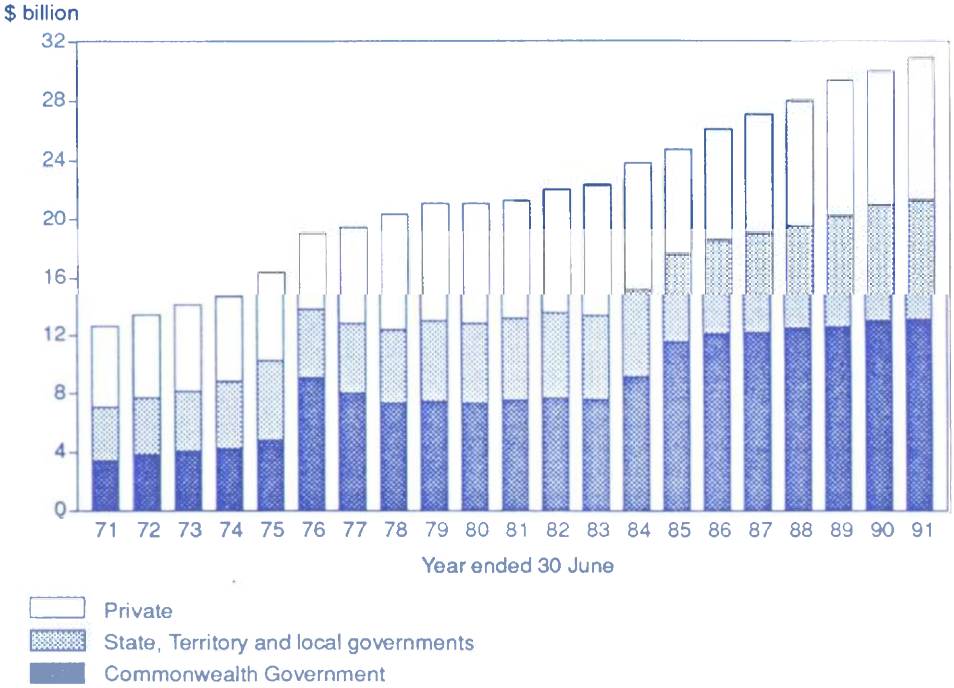
In 1988–89 (the most recent year for which complete data are available), recurrent health expenditure was $24.3 billion (93 per cent of the total), of which $10.4 billion was expended on hospitals (Figure 3.2; Table S46, page 341). Between 1983–84 and 1988–89, the proportion of recurrent expenditure devoted to hospitals declined from 45 per cent to 43 per cent.

In 1988–89, nursing home care was responsible for $2.1 billion (8.6 per cent) of recurrent health expenditure, medical services for $4.4 billion (17.9 per cent), pharmaceuticals $2.2 billion (8.9 per cent) and dental services $1.3 billion (5.2 per cent). A total of $0.85 billion (3.5 per cent) was spent on other health professional services such as physiotherapy, chiropractic and podiatry.

Changes in health expenditure 1975–76 to 1990–91

In the period 1975–76 to 1990–91, real health expenditure (in 1990–91 dollars) increased from $19.1 billion to $30.9 billion (62 per cent), an average annual increase of 3.3 per cent (see Table S48, page 343).

Figure 3.1: Total health expenditure(a) by source of funds, 1970–71 to 1990–91



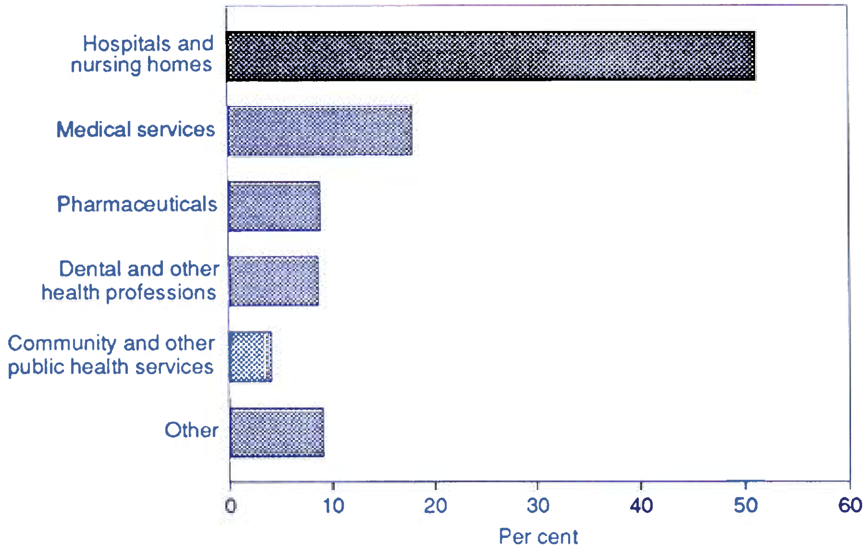
(a) Expressed in average 1990–91 prices.

Source: Australian Institute of Health and Welfare *Refer to Table S48, page 343*

Over that period, population growth was 23 per cent (1.4 per cent per year), and real per person health expenditure increased from $1,368 to $1,796 (1990–91 dollars), an increase of 31 per cent. This is an average annual increase of 1.8 per cent, or about $570 million (1990–91 dollars) extra spent per year on health.

Part of the increase in real health expenditure per capita is due to the ageing of the population, and increases in the relative use of health services by older people. Of the 31 per cent increase from 1975–76 to 1990–91, 9.4 per cent can be attributed to the increasing proportion of older people in the population (the ageing effect). By itself, the increasing proportion of older people is responsible for an increase in expenditure of about $170 million per year. The extra expenditure due to the increasing per capita use of health services by older people cannot be estimated. It is additional to the pure ageing effect of $170 million per year.

Figure 3.2: Recurrent health expenditure, proportions by major area, 1988–89



Source: Australian Institute of Health and Welfare

Refer to Table S46, page 341

An analysis of health expenditure changes, with some international comparisons

A number of factors contribute to the growth of health expenditure. Broadly, these factors relate to:

- price/cost inflation (general inflation and the excess over general inflation of any cost increases in the health sector)
- the greater use of services (from population growth and the greater per person use of services).

Technically, the effect of the inflation is summarised as a 'health care price deflator' (row 3 in Table 3.1), with the two component parts known as 'GDP deflator' (row 4) and 'excess health care inflation' (row 5). The effect of the greater use of services is known as 'real expenditure growth' (row 6), with its component parts known as 'population growth' (row 7) and 'per person volume intensity growth' (row 8).

A comparison of health expenditure growth in Australia with that in a number of other countries reveals some interesting differences (Table 3.1). Since the general inflation rate is not a characteristic over which the health system has control, the most useful index of health inflationary pressures for international comparisons is the excess health care inflation rate. This rate varies significantly from country to country. The US rate is high at an annual average rate of 2.2 per cent, and the Australian rate is low (0.4 per cent in the period 1974–75 to 1986–87). If Australia had had the same excess health care inflation rate as the US in the period 1974–75 to 1986–87, then Australian health expenditure in 1986–87 would have been $4.9 billion dollars higher than it was. An extra $4.9 billion would have lifted health expenditure in 1986–87 from 8.0 to 9.8 per cent of GDP.

Table 3.1: Comparison of health expenditure growth in Australia and selected OECD countries, 1975 to 1987

(Per cent)

Growth components[(a)]	*Aust*	*Can*	*Fra*	*FRG*	*Ita*	*Jpn*	*UK*	*USA*	*Unweighted mean*
(1) Share of health expenditure in GDP 1975[(b)]	**6.5**	7.3	6.8	7.8	5.8	5.5	5.5	8.4	6.7
(2) Nominal health expenditure growth	**14.3**	11.8	13.4	6.2	17.6	9.1	13.0	11.7	12.1
(3) Health care price deflator	**9.7**	8.6	7.6	3.9	14.9	4.1	10.8	8.1	8.5
(4) Of which GDP deflator	**9.2**	6.5	8.8	3.4	14.1	2.9	9.7	5.8	7.6
(5) Of which excess health care inflation	**0.4**	2.0	–1.1	0.4	0.7	1.2	1.0	2.2	0.9
(6) Real expenditure growth	**4.3**	2.9	5.4	2.2	2.3	4.8	2.0	3.3	3.4
(7) Of which population growth	**1.3**	1.0	0.5	–0.1	0.3	0.8	0.1	1.0	0.6
(8) Of which per person volume intensity growth	**2.9**	1.9	4.9	2.3	2.0	4.0	1.9	2.3	2.8
(9) Share of health expenditure in GDP 1987[(b)]	**8.0**	8.6	8.6	8.2	6.9	6.8	6.1	11.2	8.1

(a) See text for details.

(b) Due to differences between OECD and Australian labelling conventions, caution needs to be exercised in comparing data presented here with those published by OECD. This table follows the Australian convention of labelling data for a financial year by the second year (that is, 1974–75 data are labelled 1975), whereas OECD would label the data by the first year (that is, 1974–75 data would be labelled 1974).

Sources: Australian Institute of Health and Welfare
Schieber, Poullier 1989

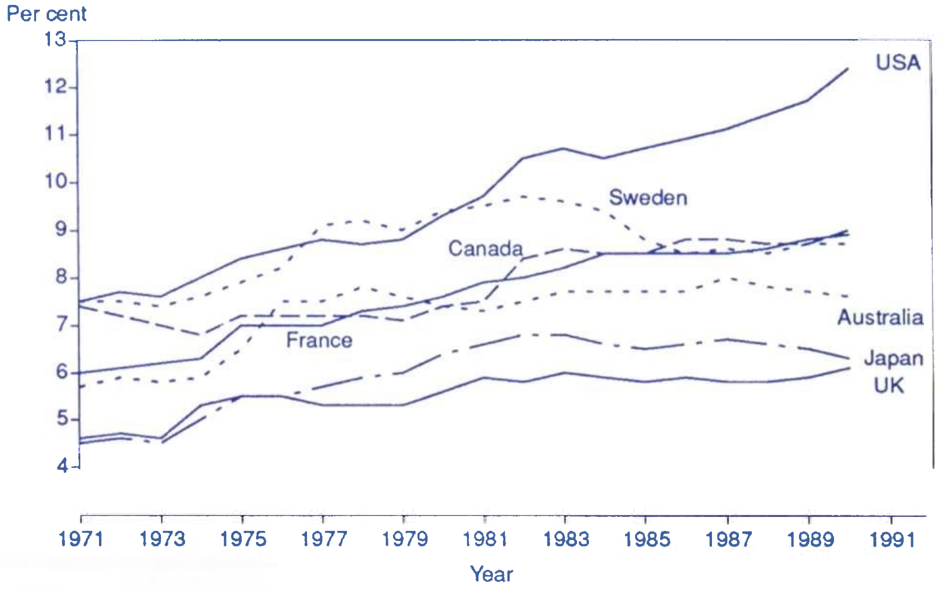
Compared with the other OECD countries considered, the higher population growth in Australia, Canada and the United States means that these countries need a higher growth in health expenditure just to keep up with population increase. The other component of real expenditure growth, the per person volume intensity growth, is the best measure of the increase in provision of health services. The growth in Australia of 2.9 per cent per annum over the period 1974–75 to 1986–87 is, except for France and Japan, higher than the other OECD countries considered.

For Australia, the 2.9 per cent annual average growth compounds over the 12-year period to a total increase of 41 per cent in services per person. France and Japan show particularly high annual average growth rates of 4.9 and 4.0 per cent respectively. Over 12 years, these compound to 78 and 60 per cent respectively.

The Japanese economy has been able to absorb the high growth rates in health services per person partly because the growth in GDP per person has been high—3.5 per cent in Japan versus the OECD average of 2.2 per cent and the Australian average of 1.8 per cent.

The change in the share of GDP expended on health depends on the growth in GDP as well as the growth in health expenditure. In the 1980s, most OECD countries have shown a levelling off in health expenditure as a percentage of GDP. The exceptions have been the United States, particularly, and France (Figure 3.3). Despite the increase in the use of health services in Japan, health expenditure as a proportion of that country's GDP is still low relative to the other OECD countries, partly due to measurement differences and partly because it started off at such a low level. The fact that most OECD countries have contained health expenditure as a percentage of GDP indicates that an increasing ratio is not necessary to maintain population health. Those countries showing stability in health expenditure have not suffered relative decreases in routine indicators of health status.

Figure 3.3: **Health expenditure for Australia and selected OECD countries as a percentage of GDP, 1971 to 1990**



Source: OECD 1991

Refer to Table S51, page 347

The effect of a country's population age structure on health expenditure

The age composition of a country's population is an important determinant of total health expenditure, because a comparatively high proportion of the health budget is spent on older people. For example, in Australia, it is estimated that 38 per cent of health expenditure in 1988–89 was for those aged 65 years and older. In June 1988, this group comprised 10.9 per cent of the population.

In contrast, many countries (particularly in Europe) have larger proportions of older people (see Table S3, page 299 and Table S4, page 300). In Sweden in 1985, for example, 17.9 per cent of the population was aged over 65 years. So, if all other things were equal, it would be expected that Sweden's health costs would be much higher than Australia's. As a direct proportion, Sweden expended 8.8 per cent of GDP on health in 1985, 15 per cent higher than the proportion expended by Australia. After allowing for differences in the age structures of the populations (using the Australian age-specific pattern of health expenditure), Sweden's health expenditure as a proportion of GDP was 9 per cent lower than Australia's (Table 3.2). Similarly, 1985 figures for West Germany suggest that health expenditure as a proportion of GDP was 13 per cent higher than Australia's. After adjustment for differences in the age structures of the populations, it was 6 per cent lower.

These adjustments make little difference when comparing Australia, the United States, Canada and New Zealand, because the age structures of the populations in these countries are similar.

Table 3.2: Health expenditure as a percentage of GDP, Australia and selected OECD countries, 1985

Country	*Health expenditure as per cent of GDP*	*Column 1 indexed to Australia as 100*	*Age-adjusted index*[a]
Australia	**7.7**	**100**	**100**
Canada	**8.5**	**111**	**110**
France	**8.5**	**110**	**97**
West Germany	**8.7**	**113**	**94**
Netherlands	**8.0**	**105**	**97**
New Zealand	**6.5**	**85**	**85**
Sweden	**8.8**	**115**	**91**
United Kingdom[b]	5.8	**76**	**65**
USA	10.7	139	139

(a) Allowance is made for differences in the age structures of the countries' populations (see text).

(b) United Kingdom health expenditure does not include nursing home expenditure. Data for 1988 for the United Kingdom indicate this omission is about 0.7 per cent of GDP (Schneider et al. 1992).

Sources: Australian Institute of Health and Welfare
OECD Secretariat 1989

Health expenditure growth in Australia

There are a number of factors influencing the proportion of GDP expended on health. Over the past 15 years, the balance of these factors has resulted in Australia experiencing reasonable stability in health expenditure as a proportion of GDP. Whether Australia can expect this stability to continue or whether the country may be faced with increases in the proportion spent on health will depend on the net effect of changes in these factors.

As noted above, the increasing proportion of older people in Australia's population has contributed to increases in health expenditure of around 0.5 per cent per year, well below the growth in GDP (about 1.5 per cent per year). While the trend to an older population will continue, the ageing of the population will not, in itself, require an increase in health expenditure as a proportion of GDP. However, the increasing per capita use of health services by older people may do so. Factors possibly contributing to a sustained growth in the use of services by older people include greater expectations of being healthy and the introduction of new technologies which enable more procedures to be undertaken safely.

The potential contribution of the cost and use of health technologies to health expenditure as a proportion of GDP is uncertain (see Section 3.7). While the advent of some new technologies has resulted in a reduction in the cost per service, easier access has enabled more services to be delivered. As well, new technologies have created new possibilities in both the diagnosis and management of many conditions. For example, it is anticipated that the new genetic technologies will generate a large demand for more diagnostic tests.

Over the last 15 years, an important factor in the growth in health expenditure has been the increase in the number of providers, particularly medical practitioners. The future impact of this factor is uncertain, as it will depend on whether governments decide to implement strategies to control it. As well, overall health expenditure may be greatly influenced if substantial changes occur in the wages and salaries of people working in the health sector.

Part of Australia's success in achieving stability in the proportion of GDP expended on health has been due to the ability of governments to contain public sector health expenditure (see 'Health expenditure in Australia', page 93). The constraints applied have affected capital expenditure more than recurrent expenditure. In the last 10 years, the growth in the total real value of capital in the health sector (that is, buildings and equipment) has not kept pace with the growth of recurrent health expenditure. This relative run down in the capital stock cannot continue indefinitely. However, there has been some catch-up in recent years and the relative decline has not been severe. This problem would require at most a 2 per cent increase in health expenditure, resulting in an increase in health expenditure as a proportion of GDP from 8.1 to around 8.3 per cent.

Possible changes to Australia's national health insurance system will also influence health expenditure, but, on past experience, incremental changes should not significantly change health expenditure as a proportion of GDP.

As explained earlier, health expenditure as a proportion of GDP also depends on the growth of GDP. For example, if GDP growth declined significantly, health expenditure as a proportion of GDP could increase without any increase in the growth of health expenditure. In the last 15 years in Australia, real GDP growth per person has averaged 1.5 per cent per year, after averaging 2.7 per cent for the 15 years previous to that. In the short term, there may well be slow-downs in GDP growth (as occurred in 1990–91 and is expected to occur in 1991–92), but there is no reason to expect that average GDP growth will fall significantly below the rather low 1.5 per cent for the last 15 years. During these 15 years, health expenditure as a proportion of GDP has remained fairly stable, within a range of 7.4 to 8.1 per cent.

Overall improvements in the health of the population could lead to reductions in health expenditure. The substantial reductions that have occurred in death rates from ischemic heart disease and strokes are encouraging. Road accident fatality and injury rates and other injury rates are continuing to decline, with a consequent reduction in the use of health services. As well, behavioural changes (such as reductions in cigarette smoking, improvements in diet and greater participation in exercise) may also result in improvements in health, possibly reducing the need for health services.

The actual level of health expenditure also reflects a society's values. For example, some societies place greater value than others on keeping terminally ill people alive, partly because of different attitudes to death. The nature of care expected also reflects current values. While societal values can change, changes are usually very gradual, so are unlikely to affect health expenditure in the short to medium term.

3.2 Private health insurance

Following the introduction of Medicare in 1984, private health insurance funds no longer provide coverage of medical practitioner services outside hospitals (see Section 1.3, page 7 for more details about Medicare). These funds now pay benefits principally for the following services:

- hospital services received by private patients in both private and public hospitals
- medical practitioner services received in a hospital by private patients
- dental, chiropractic, physiotherapy, dietetic and other supplementary services rendered by health professionals other than medical practitioners
- aids and appliances, especially spectacles
- ambulance services.

For hospital cover, private insurance is available in two forms: basic and supplementary. The basic table provides full coverage for standard facilities for private inpatients of recognised public hospitals, and partial coverage for private hospitals and day hospital facilities. The supplementary tables provide additional hospital accommodation benefits to cover the higher charges of private hospitals and the extra charge for a private room in a recognised public hospital. Membership of a basic hospital table is a prerequisite for membership of a supplementary hospital table. The following analysis focuses on private hospital insurance (basic and supplementary), which is the principal component of private health insurance. Ancillary insurance covers all areas apart from hospital services and medical services in hospitals, but only accounts for 2 per cent of private health insurance payments.

The main source for this analysis is the Private Health Insurance Administration Council (PHIAC) database, from which the details of private health fund membership for basic and supplementary hospital insurance have been extracted. Other sources are the ABS 1990 Health Insurance Survey (ABS 1991), the most recent survey of health care and insurance undertaken by TQA Research Pty Ltd (1991) and the background paper on private health insurance prepared by the National Health Strategy (Willcox 1991).

Recent changes in private hospital insurance coverage

Since the introduction of Medicare, the proportion of the population covered by basic private hospital insurance has declined. Following an initial rapid decline in the proportion of Australians covered by basic private hospital insurance from 63 per cent in September 1983 to 50 per cent in June 1984 (AIH 1990), coverage has continued to decline steadily to 42 per cent in December 1991 (see Figure 3.4, page 102).

Since March 1987, the proportion of the population with supplementary insurance cover has fluctuated around 38 per cent, and was at that level in December 1991. If the current rate of decline in membership of the basic table continues, the membership of the basic table will equal the membership of the supplementary table in March 1995 (that is, everyone who has private hospital insurance will have some supplementary cover in addition to basic cover).

These national levels conceal marked differences between the States and Territories in the proportion of the population covered by private hospital insurance, and in the rates of change in coverage since 1984. At December 1991, coverage by basic private hospital insurance was highest in New South Wales (45 per cent of the population covered) and lowest in Queensland (33 per cent) (see Figure 3.4).

Between December 1984 and December 1991, coverage by basic private hospital insurance declined most in South Australia (by 26 per cent—from 54 to 40 per cent covered) and Western Australia (by 23 per cent), and least in New South Wales (by 4 per cent) (Figure 3.4). Until 1991, the decline in Victoria had also been quite small (by 3 per cent between December 1984 and December 1990). Since then, the rate of decline in Victoria has increased markedly, with the proportion of the population with basic hospital insurance falling from 51 per cent in December 1990 to 44 per cent in December 1991—a 13 per cent decrease in one year.

The smaller than average declines in basic hospital insurance in New South Wales and Victoria in the 1980s have been attributed to significant industrial action in the health arena in those States—the doctors dispute in New South Wales and the nurses strike in Victoria (Willcox 1991). Queensland also recorded a lower than average decline (8 per cent), with basic hospital insurance falling from 36 per cent in December 1984 to 33 per cent in December 1991. The low level of initial coverage in Queensland reflects the differences in the health system in that State, which prior to the introduction of Medicare provided free hospital treatment for all its residents.

Factors influencing private hospital insurance coverage

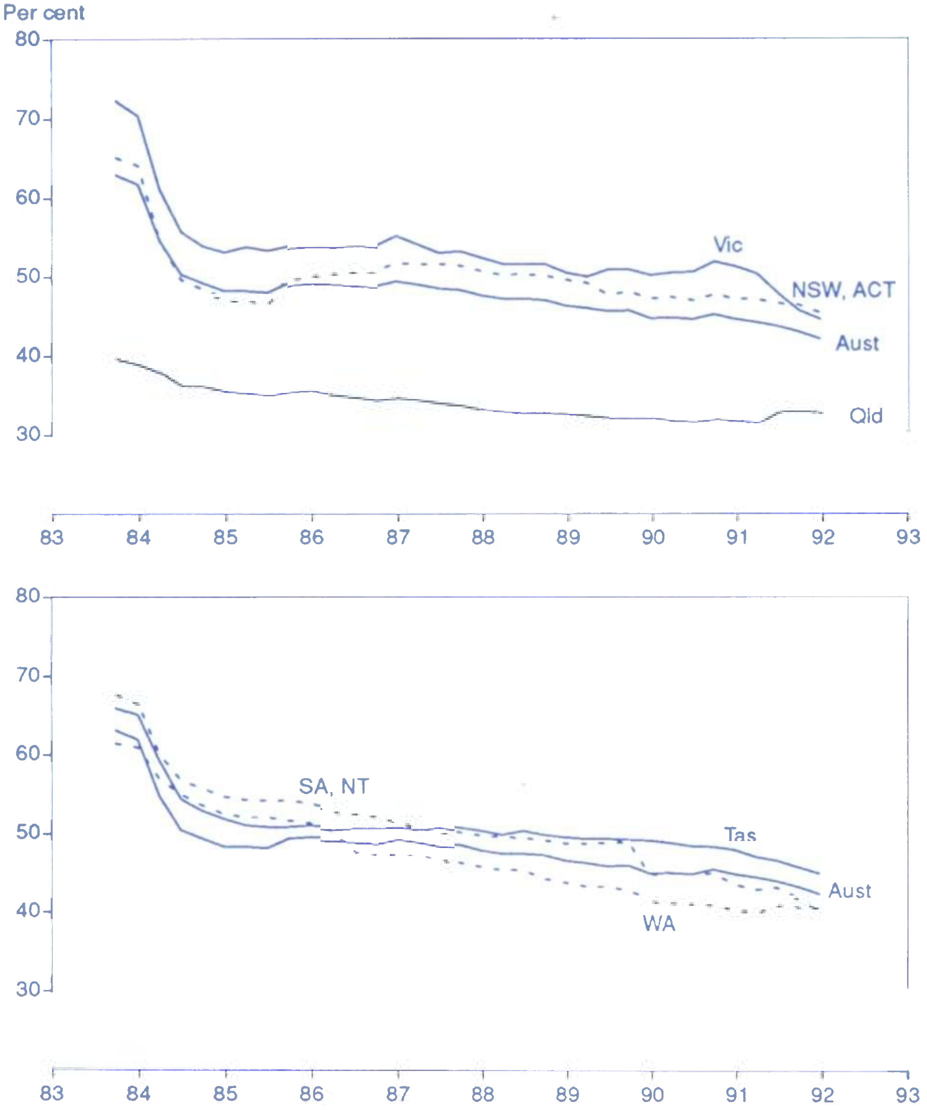
Although the proportion of the population holding only basic hospital insurance cover has declined, the proportion of the population holding both basic and supplementary cover has been stable. This suggests that those people who want private hospital insurance want more than simply choice of doctor in public hospitals—they appear to want the extra benefits that supplementary cover gives them (for example, the choice between public and private hospitals, and the ability, therefore, to avoid public hospital waiting lists). It is possible for patients with basic hospital insurance to be treated in a private hospital, but they are liable for the difference between the coverage level of basic insurance and the private hospital charge. It appears that most people are averse to large out-of-pocket health costs, so most of those wanting the option of private hospital treatment take out supplementary hospital insurance.

These reasons are largely borne out by responses to a question in the 1990 ABS Health Insurance Survey asking why people had private hospital insurance (ABS 1991). With more than one response allowed to respondents, the reason for having private hospital insurance was reported as 'choice of doctor' by 40 per cent, 'allows use of private hospitals' by 38 per cent, and 'shorter wait for treatment/concern over public hospital waiting lists' by 28 per cent. Of those with supplementary hospital insurance cover, 37 per cent reported they had insurance 'to provide benefits for ancillary services'. Overall, 43 per cent reported the reason for having private insurance was 'security/protection/peace of mind'.

These proportions for the various reasons for having private hospital insurance are similar to those reported to ABS's previous survey, in 1988. The main change in reasons given for having private hospital insurance was the decline from 47 to 43 per cent for 'security/protection/peace of mind' (ABS 1989b).

Recent market research indicates that if the segment of the population holding supplementary hospital cover were faced with a significant increase in the price of hospital insurance, very few would change down to basic cover (TQA Research Pty Ltd 1991)—they are 'price insensitive'. However, those who only hold basic cover are quite price sensitive. For this group, which is 4 per cent of the population, an increase in the cost of hospital insurance would lead to a significant number dropping their basic hospital insurance. The remaining segment of the population with no private hospital insurance are 'price insensitive', as few report they would take up insurance if there were a significant lowering in hospital insurance rates.

Figure 3.4: Proportion of population with basic private hospital insurance, States and Territories(a), 1983 to 1991



(a) Separate data not available for ACT and NT.

Source: Private Health Insurance Administration Council (unpublished) *Refer to Table S52, page 348*

Thus, if the real price of hospital insurance continues to increase as it has in the last 6 years, it appears that the trends in hospital insurance coverage will continue. The proportion who only hold basic hospital insurance will continue to decrease, but the proportion with supplementary insurance in addition to basic insurance will stay about the same, at about 37 to 39 per cent of the population.

Differences in private hospital insurance by age, income and country of birth

An important aspect of the changes that have occurred in coverage by private hospital insurance since the introduction of Medicare is the difference in coverage by age. While large declines in coverage have occurred among younger people, the proportion of older people with private hospital insurance has been virtually constant since 1983 (Table 3.3) (Willcox 1991). There was a small fall in coverage between 1983 and 1986, reflecting the introduction of Medicare in 1984, but since 1986 there have been increases in the proportions of those aged 60 to 69 years, and 70 years and over, with private hospital insurance. Between 1983 and 1990, the proportion of people with private hospital insurance who were aged 60 years and over increased from 14 to 22 per cent (Willcox 1991).

Table 3.3: Private hospital insurance, proportions by age group, 1983 to 1990

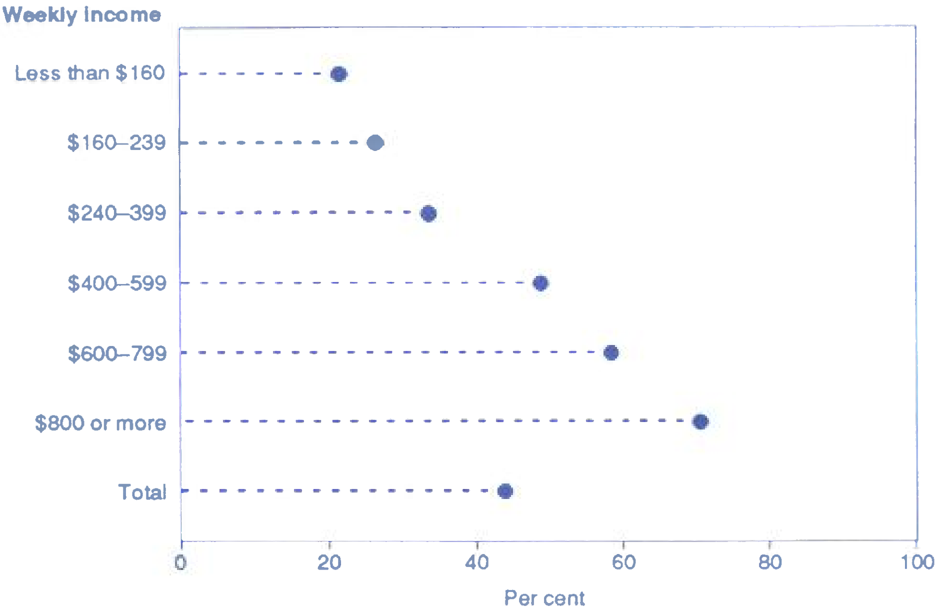
	Per cent of contributor units				
Age group (years)	*1983*	*1986*	*1988*	*1990*	*Per cent change*
15–24	**54.6**	29.3	30.0	29.5	–46
25–34	**70.4**	46.5	43.0	40.1	–43
35–49	**75.6**	55.5	53.8	52.7	–30
50–59	**71.4**	56.4	56.5	55.6	–22
60–69	**45.3**	42.0	43.4	45.1	—
70 and over	**36.0**	31.5	34.9	36.8	2
All ages	**62.1**	**44.2**	**43.6**	**43.1**	**–31**

Source: Willcox 1991

Coverage by private hospital insurance is also strongly related to income. The 1990 ABS Health Insurance Survey found that that only 21 per cent of contributor units with a gross weekly income of less than $160 had private hospital insurance, compared with 70 per cent of contributor units with a gross weekly income of $800 or more (Figure 3.5). (ABS uses the term 'contributor unit' to designate the contributor to a private health insurance fund plus all members of the same family who are covered by the health insurance arrangements of the contributor. For comparison purposes, those without private health insurance are also grouped into contributor units.) The proportions of contributor units with a gross weekly income of $600 or more having private hospital insurance increased with age, from 54 per cent of those aged 15 to 34 years, to 69 per cent aged 35 to 64 years, to 86 per cent aged 65 years or more (Willcox 1991).

The 1990 ABS survey showed some variation in insurance levels by country of birth of contributor. Private hospital insurance ranged from only 23 per cent for those units with a New Zealand-born contributor, to 48 per cent for those with a Western Europe-born contributor. Some of this variation is probably due to the average age of the different migrant groups. New Zealand-born migrants are younger than those from Western Europe, and this may be the main reason for the large difference in private hospital insurance rates.

Figure 3.5: Percentage of contributor units with private hospital insurance by gross weekly income, June 1990



Source: AIHW, derived from ABS 1991

3.3 Health personnel

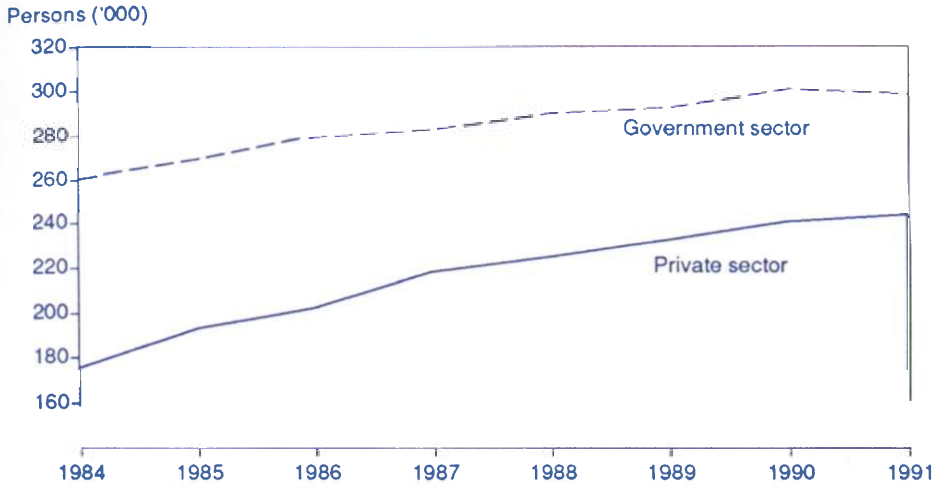
A wide variety of people are employed in the health industry, including health professionals (such as medical practitioners and nurses), other professionals (such as health service managers and engineers) and other staff (such as clerical, cleaning and various support staff).

Between 1981 and 1991, total employment in the health industry increased from 406,100 to 580,000 people (about 6.8 per cent of the civilian labourforce and 7.6 per cent of all employed persons) (see Table S53, page 348). In that period, the average annual increase in employment in the health industry was 3.6 per cent, compared with increases of 2.3 per cent in the civilian labourforce (which includes employed and unemployed people) and 1.8 per cent in the number of persons employed in industries other than the health industry. Between 1990 and 1991, the number of people working in the health industry increased by almost 4 per cent, compared with an increase of 0.7 per cent in the civilian labourforce and a decrease of 2.0 per cent in the number of employed persons in other industries.

Within the health industry, employment of wage and salary earners has continued to increase at a faster rate in the private than in the government sector (Figure 3.6).

Between 1984 and 1991, the proportion of employed wage and salary earners working in the private sector increased from 40 to 45 per cent.

Figure 3.6: Wage and salary earners in the health industry, government and private sectors, 1984 to 1991



Source: Australian Bureau of Statistics 6248.0

Employment in selected health occupations

At present, detailed figures of the numbers of people employed in different occupations in the health industry on a national basis are available only through ABS's five-yearly population censuses. At the request of AHMAC, the Institute is working on the development of a National Health Labourforce Collection, which will cover all registered health occupations. Annual figures are expected to become available progressively from 1993.

Information about the numbers of people counted in the 1991 ABS census should be available in late 1992; according to ABS's 1986 census there were 32,790 medical practitioners (23,790 general practitioners and 9,000 specialists) and 138,220 registered nurses in Australia (Table 3.4).

In an attempt to improve medical workforce data, AHMAC established a Medical Workforce Data Review Committee (MWDRC) in 1989. In a recent report to AHMAC, the MWDRC (1992) estimated that there were between 38,500 and 42,000 active medical practitioners in Australia, representing a doctor:population ratio of between 225 and 239 per 100,000. Other evidence presented in the Committee's report suggests that the doctor:population ratio for Australia is slightly lower than that for Canada and the United States, and higher than that for New Zealand and the United Kingdom. The Committee recommended that AHMAC should establish, as a planning target, a ratio of around 200 medical practitioners per 100,000 (MWDRC 1992:6).

Table 3.4: Persons employed in selected health occupations and proportions by sex, 30 June 1986

Occupation	*Persons*	*Males*	*Females*
	(Number)	*(Per cent)*	*(Per cent)*
Dental nurses	8,800	1	99
Dentists	6,310	86	14
Medical practitioners			
General practitioners	23,790	75	25
Specialists	9,000	84	16
Nurses			
Enrolled	35,220	6	94
Registered	138,220	8	92
Occupational therapists	2,770	7	93
Pharmacists	10,640	61	39
Physiotherapists	5,930	16	84
Radiographers	4,270	37	63
Speech pathologists	1,320	4	96

Source: Australian Bureau of Statistics 1989b

Education and training of health personnel

The output of graduates in the health field continued to grow in the period 1987 to 1990, but the increase between 1989 and 1990 was less than between the earlier years (Figure 3.7). The number of students commencing award courses in the health fields has also increased. Between 1988 and 1991, new enrolments in the health fields increased from 9.8 to 11.3 per cent of all award course enrolments in higher education. This increase suggests that the number of, and demand for, places in health courses has been maintained.

The phased transfer of basic nurse education from hospital-based training to the higher education sector, which began in 1984, resulted in an initial increase of about 9,000 students in basic nursing courses between 1984 and 1987. By 1991, 21,823 students (about 87 per cent of them female) were undertaking basic nursing courses in a tertiary institution. There are suggestions that newly graduated nurses are experiencing difficulties in finding employment, particularly in New South Wales, Victoria and the Australian Capital Territory. This may be a short-term situation, influenced by such factors as:

- concentration of large numbers of new job-seekers at a single point in the year (while nursing vacancies tend to be spread throughout the year)
- improved retention rates for nurses already in employment
- constrained funding
- continuing recruitment of overseas-trained nurses for specialist positions in response to high turnover rates
- more effective use of resources by employing organisations.

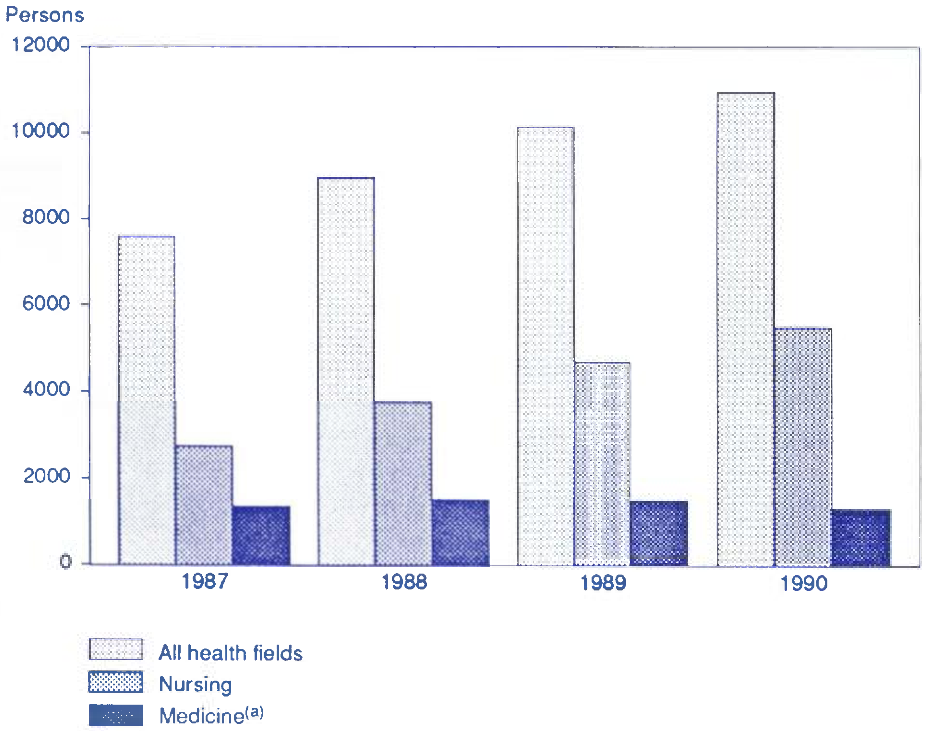
However, the situation deserves careful monitoring if over-production of nursing graduates is to be avoided.

Concern at the increase in medical practitioner numbers, particularly in general practice, led to an adjustment of medical school intakes in the mid-1980s (student enrolments in medical schools have been limited by quotas since the early 1950s). The number of Australian medical graduates, which averaged close to 1,340 per year between 1982 and 1985, declined to 1,225 in 1988, and was even lower between 1989 and 1991, due to the change in course length from five to six years at two of the larger medical schools (located at the Universities of Sydney and New South Wales). Assuming no changes in current policies, the average annual number of medical graduates is expected to be around 1,250 for the years 1993 to 1996 (Figure 3.8).

In February 1992, the AHMAC Medical Workforce Data Review Committee recommended that 'no further overall reductions should be made in medical school intakes, as the reductions which have already occurred are sufficient to move towards the proposed medical workforce target [of 200 medical practitioners per 100,000 population] provided that the growth in medical immigration is contained' (MWDRC 1992:3). The Committee also recommended an examination of the differences between States in medical school outputs and how these differences relate to the geographic maldistribution of the medical workforce.

Demand continues to exceed available places in medical schools. The Australian ratio of applications to acceptances ranges between about 5 and 10 to 1, far exceeding the ratios of 2:1 in the United States (Feldstein 1988:366), and 4:1 in Canada (Barer, Stoddart 1991: 4C15).

Figure 3.7: Students completing tertiary health professional courses in Australia, 1987 to 1990

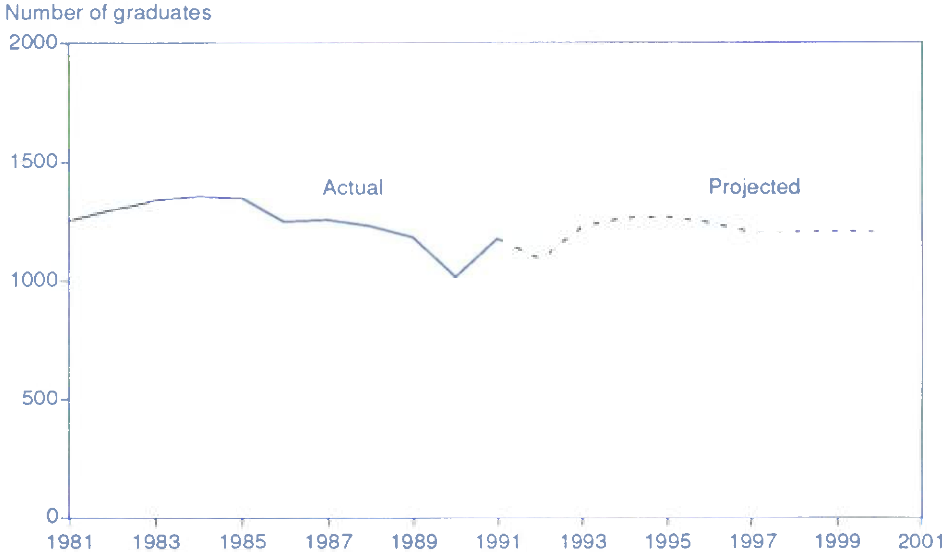


(a) Includes undergraduate training and postgraduate specialist training in tertiary institutions.

Source: Department of Employment, Education and Training (unpublished)

Refer to Appendix 1, Table A26

Figure 3.8: Graduates of Australian medical schools, actual and projected, 1981 to 2000(a)



(a) Projections for 1992 to 2000 assume no change to current policies.

Source: Deans of Medical Schools (unpublished) *Refer to Appendix 1, Table A27*

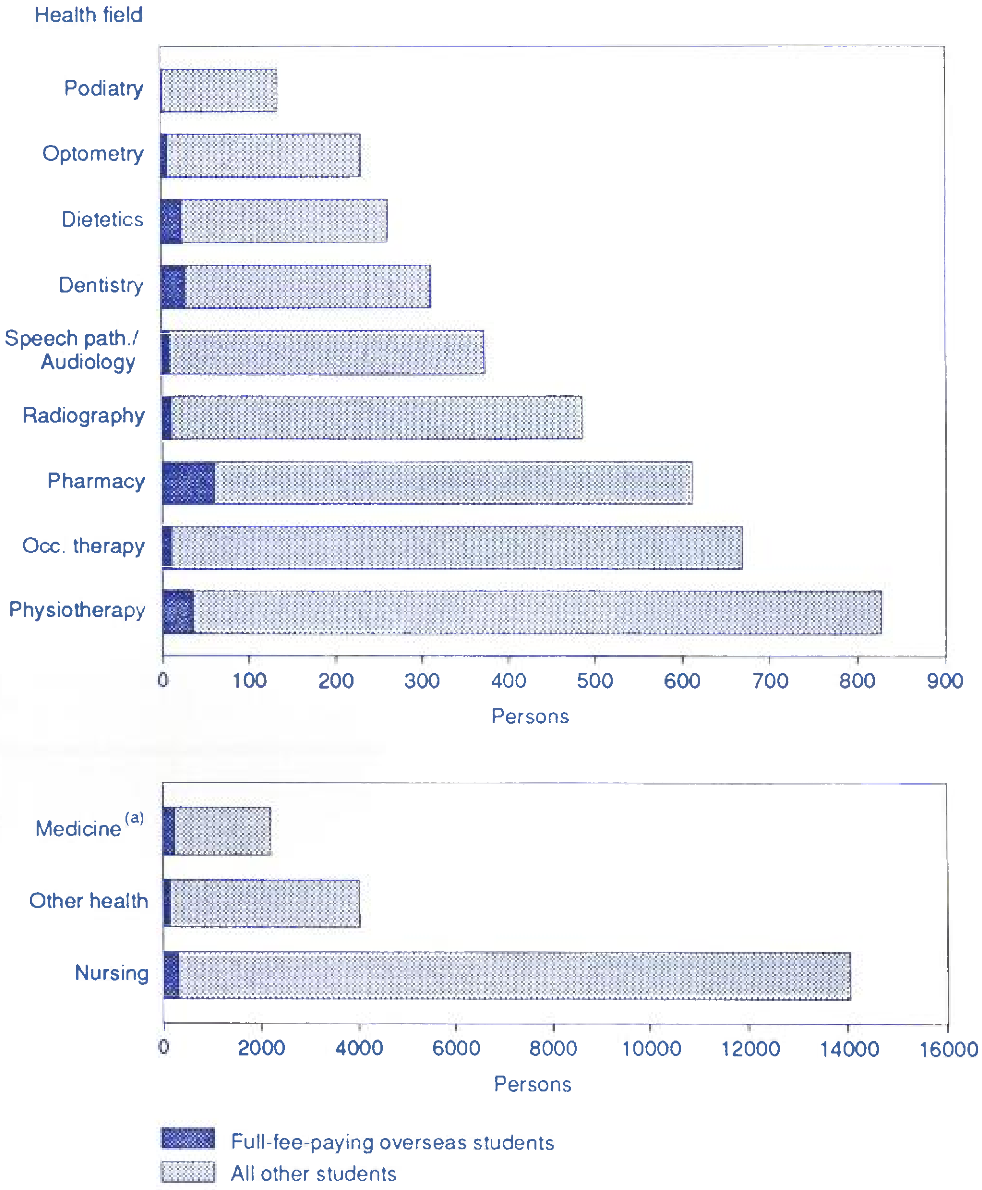
Australia's export of higher education in the health field continued to grow between 1988 and 1991, with medicine attracting the largest number of full-fee-paying overseas students undertaking award health courses. Medical schools must ensure that the enrolment of full-fee-paying overseas students does not conflict with the requirements of Australian students, for whom quotas apply (as they do for subsidised overseas students). The minimum annual fees for overseas students in medicine were set by the Commonwealth at $13,700 for 1991, but universities may charge higher fees. For example, the University of Sydney Medical School charged full-fee-paying overseas students $21,000 per year in 1991 (Industry Commission 1991).

Other health disciplines which attracted a large number of full-fee-paying overseas students were post-basic nursing, pharmacy, health administration, physiotherapy and dentistry (Figure 3.9).

The regulation of health occupations

Historically, Australia has followed the British tradition of regulating professions. The stated justification for such regulation (usually carried out through licensing or registration procedures) has been the need to protect consumers by ensuring the competence and integrity of the providers, thus maintaining the quality of professional services. Medicine, pharmacy and dentistry have been regulated for a long time, and other health occupations have been gradually added to those covered by regulatory legislation.

Figure 3.9: Commencing enrolments (excluding non-award) in health fields, 1991



(a) Includes undergraduate training and postgraduate specialist training in tertiary institutions.

Source: Department of Employment, Education and Training (unpublished)

Refer to Appendix 1, Table A28

Registration is required now for most of the key health occupations as a prerequisite to occupational practice. For most occupations, legislation requiring registration exists in all States and Territories and is administered by registration boards, usually operating as independent authorities responsible to the relevant Minister for Health. Some occupations (usually the newly emerged ones) are registrable only in some jurisdictions, some require only licensing, and some have no legal requirements to be satisfied (Table 3.5).

Regulatory arrangements originate from governments and from self-regulation, and are complicated by the involvement of members of the occupation on the boards that control them. The arrangements differ between occupations and between States and Territories.

States and Territories differ even about the qualifications and/or experience that are accepted as meeting the requirements for registration. In general, each registering authority recognises qualifications conferred by any accredited educational or training institution in Australia. However, recognition of qualifications and experience gained in other countries differs considerably between States and Territories.

Differences between regulations covering professional registration extend to areas other than eligibility for initial registration, and include restrictions on practice (imposed on practitioners as penalties under the disciplinary powers held by registering authorities), requirements for 'good standing', and restrictions on advertising.

The barriers to professional mobility and other problems created by the differences in State and Territory regulatory arrangements have been recognised for some time, but real progress on addressing these issues has been achieved only recently.

Table 3.5: Registration and other requirements for selected health occupations, States and Territories, 1991

Occupation	*NSW*	*Vic*	*Qld*	*WA*	*SA*	*Tas*	*ACT*	*NT*
Aboriginal health workers	X	M	M	X	M	X	M	R
Chiropractors	R	R	R	R	R	R	R	R
Dental technicians	R	R	R	M	X	M	R	X
Dentists	R	R	R	R	R	R	R	R
Dietitians	M	R	M	M	M	M	M	R
Medical practitioners	R	R	R	R	R	R	R	R
Nurses	R	R	R	R	R	R	R	R
Occupational therapists	M	M	R	R	R	M	M	R
Optical dispensers	R	X	L	L	X	L	X	X
Optometrists	R	R	R	R	R	R	R	R
Osteopaths	R	R	R	M	R	R	R	R
Pharmacists	R	R	R	R	R	R	R	R
Physiotherapists	R	R	R	R	R	R	R	R
Podiatrists	R	R	R	R	R	R	M	M
Psychologists	R	R	R	R	R	R	M	R
Radiographers	L	L	L	L	L	R	M	L
Social workers	M	M	M	M	M	M	M	R
Speech therapists	M	M	R	M	M	M	M	R

R Registration required by law.

L Licensing required by law.

M Membership of an appropriate body or other recognition will assist in gaining employment.

X No legal or other requirements.

Source: AHMAC Working Party on Mutual Recognition for Health Occupations unpublished

Of particular importance are the micro-economic reform proposals on mutual recognition of registration resulting from the Special Premiers' Conferences of 1990 and 1991.

At its March 1991 meeting, AHMAC translated the proposals into specific recommendations for medical practitioners, nurses and other health professions. These recommendations, endorsed in March 1991 by AHMC, will produce uniform national arrangements for all health occupations and will remove current impediments to mobility.

Medical practitioners

Since January 1986, the Australian Medical Council (AMC) has had responsibility for accreditation of Australian medical schools and for the assessment of overseas-trained doctors who seek to practise in Australia. The task of AMC's Uniformity Committee is to advise on the process of regulatory arrangements and to recommend how regulatory uniformity may be achieved.

In March 1991, AHMC decided to introduce a national system for the recognition of medical practitioners, with the new arrangements to be in place by 1 January 1993. From that date, medical practitioners who are of good standing and have complied with local practice requirements will be eligible for automatic registration if they are:

- graduates of an accredited Australian medical school who have successfully completed their intern training, or doctors who have met similar requirements in New Zealand
- overseas-trained doctors who have met the requirements of AMC, or, in the case of overseas-trained specialists, the specialist Colleges
- overseas-trained doctors who were domiciled, registered and practising on an unrestricted basis in Australia on 31 January 1992.

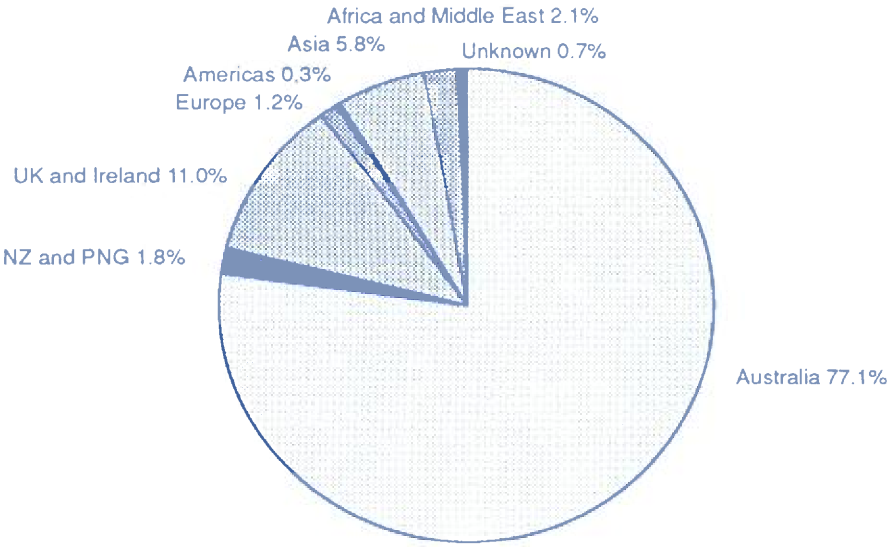
Under the new arrangements, States and Territories will still be able to register practitioners from overseas on a conditional basis to meet specific needs. Conditional registration granted under those circumstances will not confer a right to practise in other jurisdictions, unless such practitioners can demonstrate that they will be moving to a position with similar conditions.

A national database will be established and maintained by AMC on behalf of the State and Territory Medical Boards. This database, which will be updated daily from information provided by the Medical Boards, will enable practitioners registered in any State or Territory to apply for a licence to practise in any other jurisdiction. It will no longer be necessary to go through the full registration procedure in each State and Territory once primary registration has been granted. Disciplinary and other conditions will be transmitted and recorded in a similar way.

A significant impact of this coordinated approach to medical registration will be to constrain immediate entry to practice of overseas-trained doctors whose initial medical qualifications were obtained in the United Kingdom or Ireland. This group, comprising 11 per cent of all active Medicare providers in 1990–91 (Figure 3.10), have had automatic recognition in all States and Territories except New South Wales (where, from October 1987, they have had to meet AMC requirements) and South Australia (where Irish graduates must meet AMC requirements).

Accreditation of overseas-trained doctors has become progressively more restrictive over the past 20 years. In 1970, automatic accreditation was available to doctors from 20 countries in at least one State or Territory. By 1990, doctors from only four countries (the United Kingdom, Ireland, New Zealand and South Africa) were eligible. As noted above, after January 1993 automatic registration for newly arriving overseas doctors will apply only to graduates of courses in New Zealand which have been accredited by AMC.

Figure 3.10: Active Medicare providers[(a)], by place of initial qualification, 1990–91



(a) Active Medicare providers are defined as those medical practitioners who provided at least one service claimed under Medicare.

Source: Department of Health, Housing and Community Services (unpublished)

Nurses

In 1988, the Australasian Nurse Registering Authorities Conference (ANRAC), recognising the need for a coordinated approach to the regulation of nurses, foreshadowed the creation of a national register of nurses. Since May 1990, ANRAC has been moving towards the establishment of a national register and an Australian Nursing Council (ANC), whose responsibilities will be to provide and facilitate action on a range of matters including:

- the education, registration and/or enrolment, practice and professional conduct of nurses
- guidelines for the assessment and recognition of nurses qualified overseas
- competency standards
- mutual recognition of nursing qualifications
- the national register and a nurse database.

The steering committee set up by ANRAC to oversee the development of the ANC has foreshadowed the transfer of the current role of the Australian Nursing Assessment Council to the ANC. This would involve ANC in providing a single national mechanism for skills competency assessment processes for the State and Territory nurse registering authorities, and in the provision of a single pre-migration assessment process for overseas applicants.

The steering committee has advocated the establishment of the ANC under Commonwealth legislation, with complementary State and Territory legislation, and with the ANC accountable to AHMC and the State and Territory registering authorities. An alternative model is the establishment of ANC through incorporation, without a legislated framework. A decision on this issue is expected in 1992.

As is the case with the registration of medical practitioners, the State and Territory registering authorities will continue to be responsible for initial entry of nurses to their registers. Initial registration or enrolment by a State or Territory authority will entitle a nurse to practise in any other jurisdiction that maintains a comparable register. A current practising certificate will be required from the State or Territory of principal practice, but it will no longer be necessary to go through the full procedure in each jurisdiction.

There are moves under way to base registration and/or enrolment on national standards of competence, but, in the meantime, mutual recognition will be based on qualifications.

A target date of 1 January 1993 has been set for the mutual recognition of nurses, involving, in the first instance, recognition by all nurse registering authorities of:

- graduates of a nursing program approved by a State or Territory authority who have gained initial registration and/or enrolment with that authority
- overseas-qualified nurses registered and/or enrolled with an Australian nurse registering authority.

It is acknowledged that specific differences in the recognition of qualifications will continue to exist for some time—for example, nurses registered or enrolled on specific registers or rolls that are not maintained by all authorities will need to be considered on an individual basis.

Other health occupations

To varying degrees, other health occupations have also been addressing the issues of uniform regulation. Their initiatives have been given added impetus by the Conference of Premiers and Chief Ministers (CPCM), which, in November 1991, set a target date of 1 January 1993 for the introduction of mutual recognition for all occupations in the Australian labourforce.

As well as setting the mutual recognition target, the CPCM considered the development of uniform criteria, so that occupations with registration in some, but not all, jurisdictions could be either registered or deregulated throughout Australia. Although CPCM preferred deregulation for occupations where registration was not required in all jurisdictions (provided that self-regulation would not pose a risk to public health or safety), the issue has not been finalised.

An AHMAC working group is examining options for achieving mutual recognition for health occupations other than medicine and nursing. The working group is examining minimum national standards of entry to practice, and consideration is being given to alternative forms of regulation that are less restrictive than registration. These include:

- *licensing*—practice of the occupation is restricted by law to those individuals issued with licences, subject to completing or obtaining specified training or educational qualifications

- *certification*—indicates that an examination has been passed or standards of competence achieved; persons who are not certified are not, however, precluded from providing services
- *self-regulation*—an occupational organisation issues an acknowledgement that practitioners meet the organisation's standards of entry to practice (disciplinary action and requirements for continuing membership may fall within the scope of self-regulation).

Competency-based standards and assessment

The micro-economic reform proposals arising from the Special Premiers' Conferences in 1990 and 1991 covered the issues of industry and award restructuring, and restructuring of education and training. In this context, the development of competency-based standards has been advanced as a strategy that can 'offer a number of advantages to professions and para-professions whilst at the same time furthering important national objectives, particularly maintenance of professional standards, labour market efficiency and equity' (Gonczi, Hager, Oliver 1990:7ff).

'Competency-based standards', or 'levels of achievement required for competence in key areas of professional practice', can:

- assist in the maintenance of professional standards by providing explicit statements of what people need to be able to do to practise successfully as a professional
- facilitate the development of an international framework for trade in services by protecting national consumers of foreign supplied professional services, and help to reduce discrimination
- provide a useful basis for negotiation on the international recognition of qualifications
- cover all forms of achievement in competence, rather than rely exclusively on formal indicators
- enable professionals to enter the profession at an appropriate level, allowing best use of skills available in the community
- provide a basis for professionals already in practice to have their higher competency levels recognised
- facilitate the recognition and employability in an allied field of those who attempt but fail to obtain professional qualifications
- allow the development of career structures, including those that allow progression from trade to para-professional to professional levels
- help groups, whose skills may not presently be recognised, to gain recognition by focusing on competence rather than the way in which it was acquired.

The National Training Board, established in 1989 by the Commonwealth Government, has specific responsibility for the development of national skill standards. Following the development of these standards, suitable methods of assessing individuals will need to be established, as concern that formal education and training programs often lack relevance to the requirements of the workplace has led to demands for competency-based assessment.

Competency-based standards are being developed in a number of health professions. For example, the Dietitians Association of Australia adopted in May 1990 an interim set of 'Minimum standards for professional training', which specified competency areas required for entry to the profession. The standards covered a number of general attributes and included detailed recommendations for curriculum content and guidelines for training courses. The implementation of competency-based standards will require endorsement by the relevant industry training board. The Community Services and Health Industry Advisory Training Board (established in March 1992) will perform this function for the health industry.

Competency-based assessment procedures are seen as being of particular importance and relevance in the assessment for recognition of overseas-trained professionals, including health professionals. The Migrant Skills Reform Strategy, involving the Commonwealth, State and Territory governments, and the professions, is designed to promote better recognition of migrant skills in Australia. The Strategy encourages the development, adoption and application of national competency-based standards in occupations where entry requirements apply.

The move towards competency-based standards and assessment has led to a review of all the panels and councils making up the assessment network of the National Office of Overseas Skills Recognition. The coordination of these assessment functions, with the establishment and maintenance of mutual recognition and uniform regulation of health occupations, will be a challenge for such bodies as the Australian Medical Council, the Australian Nursing Council and the Association of Pharmacy Registering Authorities.

3.4 Institutional facilities

In Australia in 1989–90, there were approximately 1,000 acute care hospitals, 60 public psychiatric hospitals, 1,500 nursing homes and 1,000 hostels, the latter providing minimal level of health care and long-term accommodation for young disabled and older people (Table 3.6).

The number of institutions providing care is a not necessarily a good indicator of the supply of health care facilities—the number of beds per 1,000 population (bed ratio) is a better measure, provided the beds are 'available' to be filled if needed (see Box 3.1).

In Australia in 1989–90, there were 5.0 available acute hospital beds per 1,000 population. The 1980s was a period of steady decline in this number; the decline occurred mainly in the public sector, with numbers falling by about 3 per cent a year between 1985–86 and 1989–90, from 4.1 to 3.7 beds per 1,000 population (Table 3.6, Box 3.2). Between 1985–86 and 1989–90, the supply of private sector hospital beds remained roughly constant at about 1.3 beds per 1,000 population.

The reduction in acute hospital beds per 1,000 population has resulted from policy decisions made by the State and Territory health authorities. In 1985–86, the health authorities had planned to reduce their bed ratios from between 3.9 and 6.4 beds per 1,000 to between 3.25 and 5.0 (Harvey, Mathers 1988). Such reductions in bed supply were possible because of the rapid reduction in length of stay that occurred during the 1980s. By 1989–90, some authorities had achieved their targets, while others still had some way to go.

Accurate comparison with other countries is difficult, but the most recent data (for 1986) suggest that Australian bed ratios are high compared with many OECD countries (OECD unpublished). Compared with an Australian ratio of 5.3 beds per 1,000 population in 1986, USA had 4.1, Canada 4.5, the United Kingdom 2.8 and Sweden 4.3. However, some European OECD countries had higher ratios—Austria 6.6, France 5.6 and Germany 7.6.

For public psychiatric hospitals, the number of beds per 1,000 population has fallen from 2.3 in 1970 to 0.5 in 1989–90. During the 1970s and early 1980s, the ratio fell by about 6 per cent a year (Mathers, Harvey 1988). The rate of reduction increased temporarily between 1985–86 and 1987–88 with an average annual decline of 24 per cent (Table 3.6), and, since then, has continued to decline at about 2 per cent a year. The big reductions in the mid-1980s were the result of increasing moves towards the de-institutionalisation of patients requiring both acute and long-term psychiatric care.

Throughout the 1970s and early 1980s, the numbers of nursing home beds per 1,000 increased slowly (Mathers, Harvey 1988). Since 1985–86, with the introduction of Commonwealth planning ratios (see Section 1.3), this trend has reversed. The reduction in nursing home bed ratios since the mid-1980s is most evident when considering beds per 1,000 people aged 70 years and over. For this age group, the available data suggest a decline of 2.6 per cent per year, from 64.9 beds per 1,000 population in 1985–86 to 58.5 in 1989–90 (Table 3.6).

Table 3.6: Institutions and available beds, 1985–86 to 1989–90

Institution type	*1985–86*	*1987–88*	*1989–90*
Institutions			
Hospitals			
Public acute(a)	751	723	690
Public psychiatric	48	39	59
Private	332	331	329
Aged nursing homes(b)	1,410	1,429	1,437
Hostels	851	987	1,021
Available beds(c)			
Hospitals			
Public acute(a)	64,692	64,465	61,066
Public psychiatric	12,741	8,620	8,513
Private	21,101	21,568	21,733
Aged nursing homes(b)	72,168	72,116	72,615
Hostels	39,816	43,004	44,470
Nursing home:hostel ratio	64:36	63:37	62:38
Available beds (per 1,000 population)(a)(c)(d)			
Hospitals			
Public acute(a)	4.1	3.9	3.7
Public psychiatric	0.8	0.5	0.5
Private	1.3	1.3	1.3
Aged nursing homes(b)	64.9	61.4	58.5
Hostels	35.8	36.5	35.8

(a) Includes Department of Veterans' Affairs and auxiliary hospitals. Queensland outpatient clinics aggregated with associated hospitals. The 1985–86 data include approximately 19 Western Australian nursing posts which have been excluded from later years.

(b) Figures do not include approximately 70 nursing homes for the young disabled.

(c) Average available beds where possible, otherwise available beds at 30 June.

(d) Rates per 1,000 population calculated using total population for hospitals and population aged 70 and over for nursing homes and hostels.

Sources: Australian Institute of Health 1988
Department of Health, Housing and Community Services 1991a

Box 3.1: Indicators of institutional facilities

The numbers of institutions providing care are not, in themselves, good indicators of the supply of facilities. This is largely because institutions differ both in size and the type of services they provide, and the numbers change for a variety of administrative reasons (such as closures and mergers).

Even the definitions of the various institutions are problematic. For example, a country hospital with an attached nursing home may be counted as two institutions, while multiple, geographically separate facilities administered by a single board of management may be counted as a single establishment. Such problems are likely to increase with the trend towards the formation of area health authorities, and with program management. These difficulties are being considered in the review of the National Minimum Data Set for Institutional Health Care.

The number of beds per 1,000 population is a better measure of the provision of health care facilities, provided the beds are available to be filled if needed. However, while the concept of an 'available bed' is commonly used in the health industry, there is no universally accepted definition. It is generally accepted that to be 'available' a bed needs to be staffed, or be capable of being staffed within a reasonable time. There are, however, no standards as to the number or type of staff that are required before a bed can be regarded as being staffed, nor is there a precise definition of what is 'reasonable' in reference to time. Bed counts should exclude facilities such as recovery trolleys, delivery beds, cots for normal neonates and same-day beds for non-inpatients, but the extent to which these, and similar facilities, are included in reported bed counts is uncertain. Short-term bed closures for reasons such as industrial action or ward renovations also present a potential problem in counting bed numbers. As well, changes in definitions can result in apparent changes in the underlying supply of facilities, and in estimated occupancy rates. Despite this, the number of available beds represents a useful statistic for measuring the supply of institutional health care. In principle, available beds should be counted in an annual census of beds, but until recently there have been no guidelines relating to timing.

In addressing these problems, which create difficulties in considering State, regional and international differences, the Australian Institute of Health and Welfare has developed, in consultation with the State and Territory health authorities and the Australian Bureau of Statistics, a set of recommended definitions for use in hospitals and related institutions. This National Minimum Data Set for Institutional Health Care (NMDS) was approved in August 1989 by AHMAC. At subsequent meetings, AHMAC requested the Institute and ABS to conduct annual surveys of health institutions for four years from 1991–92. These surveys are to be based upon the definitions agreed in the NMDS. The Institute has also been requested to review and modify the NMDS as problems become apparent during its implementation by the various health authorities.

Between 1985–86 and 1987–88, the number of hostel beds per 1,000 persons aged 70 years and over increased slightly, but then declined slightly with the result that the level in 1989–90, 35.8 beds per 1,000, was the same as in 1985–86. However, in 1991, hostel bed numbers increased by 6 per cent with the addition of 2,600 beds (HHCS 1991). These changes are consistent with the Commonwealth Government's policy of accommodating older people who are less frail in hostels, rather than in nursing homes, and is reflected in changes in the ratio of beds in nursing homes to beds in hostels. In 1985–86, the ratio was 64:36, after having been approximately 75:25 in the early 1980s. In 1991 it was 61:39, compared with the long-term target ratio of 42:58 recommended by the Aged Care Reform Strategy Mid Term Review (HHCS 1991). As well as these changes in the nursing home to hostel accommodation ratio, the Commonwealth is also placing greater emphasis on community care for older people (see Section 1.3).

Box 3.2: Hospital Utilisation and Costs Study

At the request of AHMAC, the Australian Institute of Health undertook its first Hospital Utilisation and Costs Study (HUCS) in 1986. The Study provided information on the use and costs of hospitals and related institutions within Australia in 1985–86. Data from this study were presented in a four-volume report and in the Institute's first biennial report (AIH 1988).

During 1989, the AIH undertook a second HUCS for the fiscal year 1987–88 and the data were presented in a special AIH report and in Australia's health 1990. *Data from these two HUCS surveys and from the third and final HUCS for the fiscal year 1989–90, have been included in this report. The HUCS surveys have been replaced by an annual National Minimum Data Set collection which will include private hospitals (see Box 3.1).*

Regional variations in bed supply

Bed availability in all types of health care institutions varies between States and Territories (Table 3.7). For acute hospitals, Victoria (4.5 beds per 1,000 population) and New South Wales (4.7) have lower bed ratios than the other States. New South Wales has the lowest ratio of beds in private hospitals at 1.1 per 1,000 population. For aged care beds (in nursing homes and hostels), the lowest ratios are in Victoria (82.6 beds per 1,000 population aged 70 years or older) and Tasmania (84.2).

Table 3.7: Beds(a), States and Territories, 1989–90

(Per 1,000 population)

Institution type	*NSW*	*Vic*	*Qld*	*WA*	*SA*	*Tas*	*ACT*	*NT*
Hospitals								
Public acute(b)	3.6	3.1	3.9	4.0	4.0	4.3	3.1	3.8
Public psychiatric	0.5	0.6	0.4	0.3	0.5	0.5	0.0	0.0
Private	1.1	1.4	1.5	1.2	1.5	1.3	(c)	(c)
Aged nursing homes	64.5	50.2	57.7	59.4	59.7	59.5	53.7	67.3
Hostels	32.4	32.4	42.3	41.5	45.2	24.7	43.8	33.8

(a) Rates per 1,000 population calculated using total population for hospitals and population aged 70 and over for nursing homes and hostels.

(b) Includes Department of Veterans' Affairs and auxiliary hospitals.

(c) Inadequate cell size.

Sources: Australian Institute of Health and Welfare
Department of Health, Housing and Community Services 1991b

Overall, for acute hospital beds, people in major urban areas have lower bed ratios (4.4 beds per 1,000 population) than do people in other areas (5.4 beds per 1,000 population) (Table 3.8). (For an explanation of the terms 'major urban' and 'other' areas, please refer to page 125 in Section 3.5.) The much lower bed ratios for public hospital beds in major urban areas (3.1 per 1,000 population, compared with 4.6 in other areas) is partially offset by a higher ratio for beds in private hospitals (1.3 per 1,000 population in major urban areas, compared with 0.8 in other areas). Despite the higher bed ratios in areas other than major urban areas, people in these 'other' areas have generally limited access to particular specialities and intensive care beds. For example, all teaching hospitals are located in major urban areas. The greater specialisation in major urban areas, considered essential to maintain skill levels and quality of care, means that people living in other areas are more likely to require inter-hospital transfer at some stage of their hospital stay than are people living in the major urban areas.

In contrast to acute hospital beds, bed ratios for nursing homes are higher in major urban than in other areas (4.6 compared with 3.7 beds per 1,000 population) (Table 3.8).

Table 3.8: Beds[(a)] by major urban and other areas, 1989–90

(Per 1,000 population)

Institution type	*Major urban*	*Other*
Hospitals		
Public acute (b)	3.1	4.6
Public psychiatric	0.5	0.5
Private	1.3	0.8
Nursing homes	4.6	3.7

(a) Rates per 1,000 population calculated using total population for hospitals and nursing homes.

(b) Includes Department of Veterans Affairs' and auxiliary hospitals.

Sources: Australian Institute of Health and Welfare
Department of Health, Housing and Community Services 1991a

3.5 Use of hospitals and other institutions

Hospitals provide a wide range of health services and treat patients in a variety of settings. Some patients require admission to hospital and are referred to as inpatients.

Other patients do not require admission and are treated in accident and emergency (casualty) departments, undergo short-term specialist treatment (such as minor surgery, radiotherapy or chemotherapy), or are treated in their own homes through home nursing programs. Such patients are frequently termed outpatients, but the term has not been applied consistently. Some health authorities do not classify patients treated in accident and emergency departments or home nursing patients as outpatients, while other authorities include all patients not requiring admission. Classification of patients requiring specialist short-term treatment also varies, both between health authorities and for different types of treatment. Some patients are classified as outpatients and some as same-day inpatients.

Over recent years, these issues have been addressed by AHMAC, initially by the establishment in 1987 of a Taskforce on National Hospital Statistics, and then by a National Hospital Statistics Project, which included a number of working parties. At its August 1989 meeting, AHMAC endorsed the development of a National Minimum Data Set for Institutional Health Care (NMDS) (see also Box 3.1, page 117), as recommended by the National Hospital Statistics Project. The NMDS includes the use of standard definitions for the classification of hospital patients, comprising two main groups—inpatients and non-inpatients. While it may take some time for all health authorities to adopt completely these and other standard definitions, this section follows the NMDS definitions concerning inpatients (including same-day patients) and non-inpatients. Data are presented only for inpatients and non-inpatients treated within hospitals.

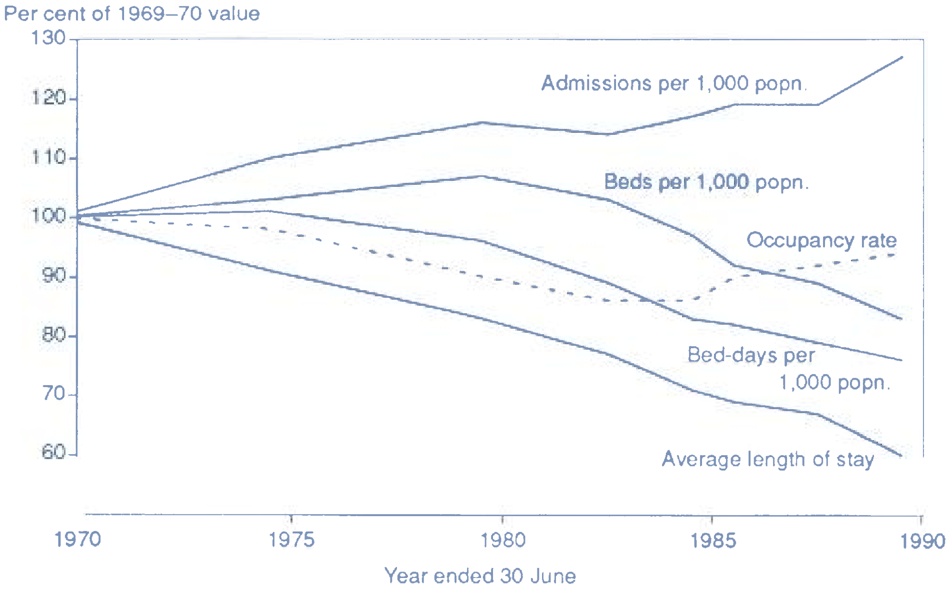
Use of acute hospitals—inpatients

Over the last two decades, rates of admissions to acute hospitals have fluctuated (Figure 3.11). Following the increase in admission rates that occurred during the 1970s, rates declined slightly in the early 1980s. These declines coincided with reductions in bed to population ratios, and partly resulted from industrial action within hospitals. In contrast, admission rates increased markedly during the late 1980s. Between 1985–86 and 1989–90, the rate increased from 211 to 225 admissions per 1,000 population (Table 3.9). Almost all of this increase occurred between 1987–88 and 1989–90, with an average annual increase of 2.8 per cent.

The average time spent in acute hospitals by inpatients has continued to fall (Figure 3.11). In 1989–90, the mean duration of inpatient stay was 5.6 days, with patients in private hospitals having shorter stays (4.6 days) than those in public hospitals (6.0 days). These levels are significantly lower than the levels in 1985–86—6.5 days overall, 6.8 days for public hospitals and 5.5 days for private hospitals.

The differences between the public and private hospitals partly reflect their different roles. For example, private hospitals generally do more short-stay surgery. In New South Wales in 1988–89, 64 per cent of private hospital patients underwent surgery, compared with 38 per cent of public hospital patients. Of those inpatients having surgery, 12 per cent of private hospital patients had surgery on the ear, nose, throat or eye, compared with 5 per cent of public hospital patients. In contrast, only 6 per cent of surgical patients in private hospitals underwent operations involving the circulatory or respiratory systems, compared with 16 per cent in public hospitals (AIHW unpublished).

Figure 3.11: Utilisation and bed supply[(a)], all acute hospitals, 1969–70 to 1989–90



(a) Beds and bed-days calculated at 30 June.

Source: Australian Institute of Health and Welfare

Refer to Appendix 1, Table A29

The continued reductions in lengths of hospital stay are reflected in falls in the number of bed-days used by patients in acute hospitals (Figure 3.11). Between 1985–86 and 1989–90, the number of bed-days per 1,000 population fell by 2 per cent per year, from 1,369 to 1,262 per 1,000 (Table 3.9).

In general, the proportion of bed-day use in the private sector increased from the early 1970s until the mid-1980s, with two significant discontinuities in the trend (Goss 1991). These discontinuities occurred in 1976 and 1983–84 and were probably due to the introduction of Medibank and Medicare respectively. Between 1985–86 and 1987–88 there was also a slight reduction in the proportion of bed-day use in the private sector, from 22 per cent to 21 per cent, which probably reflects both rapidly reducing lengths of stay and the removal in 1986–87 of Commonwealth bed-day subsidies to private hospitals (Goss 1991). By 1989–90, the proportion had returned to 22 per cent.

During the 1970s and the early 1980s, occupancy rates declined in response to reductions in lengths of stay (Figure 3.11). However, between 1985–86 and 1989–90, the estimated overall occupancy rate increased from 69 to 71 per cent (Table 3.9). Most of this increase occurred between 1987–88 and 1989–90, when occupancy levels for all acute hospitals increased by 1.7 per cent, compared with an increase of 0.5 per cent between 1985–86 and 1987–88 (Table 3.10). For both time periods, the increases occurred in the context of annual population growths of about 2 per cent.

Between 1987–88 and 1989–90, changing admission rates and bed closures also made substantial contributions to occupancy levels, but changes in these factors had less impact on occupancy rates in the earlier period. The factors contributing to increases in occupancy levels were partly offset by reductions in length of stay, which were even greater for the more recent period.

The relative importance of the various factors influencing occupancy levels differed between the public and private sectors (Table 3.10). Between 1987–88 and 1989–90, the effects of population growth and shorter lengths of stay were similar in public and private hospitals; however, the increase in admission rates made a much greater contribution to occupancy levels in private hospitals than it did in public hospitals. The other major difference between public and private sectors related to changes in bed supply. In contrast to the public sector, where the reduction in bed supply made a major contribution to occupancy levels, increased bed supply in the private sector made a small negative contribution.

For the 1985–86 to 1987–88 period, there is a marked difference between the public and private sectors in admission rate trend and its effects (Tables 3.9 and 3.10). For the private sector, the reduction in admission rates (possibly resulting from removal of the Commonwealth bed-day subsidy) contributed to an overall decrease of 4.4 per cent in occupancy levels. In contrast, admission rates rose slightly in the public sector, contributing to an increase of 1.0 per cent in occupancy levels.

There are significant inter-hospital differences in occupancy levels. In 1987–88, public sector metropolitan hospitals with 500 beds or more had an occupancy level of 84 per cent. Around 55 per cent of all teaching hospitals (comprising about 5 per cent of all hospitals) had occupancy levels in excess of 80 per cent, while about 16 per cent had average occupancy levels of over 90 per cent (Table 3.11). Some hospitals were running at, or near, capacity for significant periods, and this would certainly be the case in specific units or wards.

Table 3.9: Use of acute hospitals[a], 1985–86 to 1989–90

Use / Acute hospital type	*1985–86*	*1987–88*	*1989–90*
Admissions[b]			
Public ('000)	2,466	2,622	2,790
Public (per 1,000 population)	156	160	165
Private ('000)	872	878	1018
Private (per 1,000 population)	55	54	60
Total ('000)	3,338	3,486	3,808
Total (per 1,000 population)	211	213	225
Average length of stay (Days)			
Public	6.8	6.6	6.0
Private	5.5	5.2	4.6
Total	6.5	6.2	5.6
Bed-days			
Public ('000)	16,891	17,098	16,669
Public (per 1,000 population)	1,068	1,043	983
Private ('000)	4,766	4,531	4,731
Private (per 1,000 population)	301	276	279
Total ('000)	21,657	21,629	21,400
Total (per 1,000 population)	1,369	1,319	1,262
Occupancy (Per cent)			
Public	72	73	75
Private	62	58	69
Total	69	69	71
Non-inpatient services			
Public ('000)[c]	37,666	43,711	38,209
Public (per 1,000 population)	2,381	2,666	2,253

(a) Public hospitals include Department of Veterans Affairs' and auxillary hospitals. Private hospitals include private psychiatric hospitals.

(b) The number of separations was taken as the number of admissions.

(c) Number of services was estimated as the number of treatments plus three times the number of visits.

Sources: Australian Institute of Health 1988
Gillett et al. 1991

Table 3.10: Estimates of effects of various factors influencing occupancy levels in acute hospitals, 1985–86 to 1989–90

(Per cent)

	Public hospitals		*Private hospitals*		*All hospitals*	
Factor	*1985–86 to 1987–88*	*1987–88 to 1989–90*	*1985–86 to 1987–88*	*1987–88 to 1989–90*	*1985–86 to 1987–88*	*1987–88 to 1989–90*
Population growth	2.4	2.3	2.1	1.8	2.3	2.2
Admission rate	1.3	2.3	–1.8	7.2	0.3	3.7
Reduced length of stay	–3.3	–6.8	–3.6	–6.3	–3.2	–6.7
Bed supply	0.1	3.9	–1.5	–0.6	–0.4	2.5
Total	**1.0**	**1.9**	**–4.4**	**1.9**	**0.5**	**1.7**

Sources: Australian Institute of Health 1988
Gillett et al. 1991

Table 3.11: Percentage distribution of hospitals by average occupancy rate and type of public hospital, 1989–90

(Per cent)

Occupancy rate (%)	*Teaching*	*Base*	*Community*	*All hospitals*
0–29	—	—	5.1	4.3
30–39	—	—	6.5	5.5
40–49	—	—	10.1	8.6
50–59	4.7	7.1	19.7	17.6
60–69	7.0	16.1	26.2	24.1
70–79	37.2	42.9	16.6	20.3
80–89	37.2	28.6	11.9	15.0
90 and over	14.0	5.4	3.8	4.6

Source: Australian Institute of Health and Welfare

Same-day surgery

In recent years, there has been a trend towards treating hospital patients on a same-day basis, reflecting changing medical practice and increasing pressure on resources.

One aspect which has contributed to this trend is the provision, under the basic health insurance table, of same-day patient benefits for designated same-day procedures. Between 1987 and 1992, the number of free-standing private day surgery centres increased from 9 to over 60 centres (HHCS unpublished). Many of these centres are dedicated to gastrointestinal endoscopy.

As well, a greater proportion of patients in general acute hospitals are being treated on a day-only basis. These trends have been encouraged by the Commonwealth Government through the Medicare Agreements with incentives for public hospitals to treat suitable surgical patients on a day-only basis. The data available suggest that the proportion of same-day patients in public acute hospitals has increased from about 20 per cent in 1987–88 to 24 per cent in 1989–90 (AIHW unpublished). For the latter year, 27 per cent of admissions to private hospitals were same-day patients. For many diagnostic procedures and some surgical procedures most patients receive same-day care.

Use of acute hospitals—non-inpatients

A large part of the workload of the public hospital system involves the treatment of non-inpatients. However, compared with data on inpatients, the data available on non-inpatients treated in public hospitals are less reliable—they have not been collected in a consistent manner, either over time or between States and Territories. Despite limitations in the data, it is estimated that 38 million non-inpatient treatments per year are provided in public hospitals, or about 2,250 treatments per 1,000 population (Table 3.9). Generally, private hospitals do not give non-inpatient care—only about 4 treatments per 1,000 population are provided in private hospitals each year (AIH 1991a).

It is believed that an increasing number of hospital patients are being treated in non-inpatient settings. That the data in Table 3.9 do not support this almost certainly reflects definitional problems in the counting of non-inpatients. Since the late 1980s, New South Wales and South Australia have introduced more rigorous guidelines for the counting of non-inpatients. These changes reflect the NMDS principles, and should lead to a more appropriate count of non-inpatient services in future, but they have introduced difficulties in comparing trends over recent years. Excluding New South Wales and South Australian data, the numbers of non-inpatients increased from 23.0 million in 1985–86 to 24.6 million in 1987–88, and to 24.8 million in 1989–90, an average annual increase of 1.9 per cent (slightly less than population growth).

Regional variations in acute hospital use

Differences between regions (between and within States and Territories) in acute hospital use may result from a number of factors, including differences in the demographic structure of the population, differences in the underlying health status of the population, differences in policies and structure of the health system, and aspects of medical practice.

Structural and policy differences in the health system that can influence hospital use include the distribution of specialty services (and the necessity to transfer patients), the numbers of doctors, the de-institutionalisation of psychiatric services and the supply of hospital beds. Medical practice can differ in choice of inpatient or non-inpatient treatment of patients, and in the degree to which surgery is used as the definitive treatment for specific conditions.

Comparison of regional hospital use is complicated also by inter-regional flows (that is, by patients from one region being admitted to a hospital in another region), some of which can be significant. For example, the catchment population for hospitals in the Australian Capital Territory includes people living in the neighbouring areas of south eastern New South Wales. However, data on the catchment populations of specific hospitals or groups of hospitals are not generally available, so it is not possible to account for inter-regional flows in the following discussion.

States and Territories

There are substantial differences between the States and Territories in the use of acute hospitals (Table 3.12), but the reasons for the differences are not entirely clear. In 1989–90, the Australian Capital Territory had the lowest levels of hospital admissions—200 admissions per 1,000 population (11 per cent below the national average of 225 per 1,000)—and the lowest average length of stay (5.2 days—7 per cent below the national average of 5.6 days). As a result, bed-day use in the Australian Capital Territory was 18 per cent below the national average. In contrast, South Australia had an admission rate of 270 per 1,000 population (20 per cent higher than the national average). Its shorter average length of stay (5.4 days—4 per cent below the national average) resulted in a bed-day use per 1,000 population that was 16 per cent higher than the national average.

As noted above, differences in population age structures can contribute to the differences in admission rates between the States and Territories. For example, 12.8 per cent of the South Australia population is aged 65 years or more, the highest of any State or Territory, and only 5.9 per cent of the population of the Australian Capital Territory is in this age group. Unfortunately, the data necessary to adjust admission rates for different age structures are not available routinely to the Institute.

Some of the differences in admission rates could relate to differences in classification of same-day patients (as inpatients or as non-inpatients). In the absence of data on same-day admissions for all States and Territories, and for public and private hospitals, complete evaluation of this factor is not possible. However, exclusion of same-day admissions for those States and Territories for which data are available increases, rather than diminishes, the differences.

Table 3.12: Use of acute hospitals[a], States and Territories, 1989–90

	NSW	*Vic*	*Qld*	*WA*	*SA*	*Tas*	*ACT*	*NT*	*Australia*
Admissions (per 1,000 population)	221	211	231	224	270	232	200	246	225
Same-day admissions (per cent)[b]	28	na	20	20	23	na	na	na	na
Bed-days (per 1,000 population)	1,233	1,192	1,319	1,268	1,469	1,390	1,031	1,314	1,262
Average length of stay (days)	5.6	5.6	5.7	5.7	5.4	6.0	5.2	5.2	5.6
Occupancy (per cent)	72	73	67	66	72	67	79	77	71

(a) Includes private psychiatric hospitals.

(b) NSW, Qld and SA data estimated from 1989–90 data. WA data estimated from 1989 data. Private hospital data were unavailable for Vic, Tas, ACT and NT.

Sources: Australian Institute of Health and Welfare

Differences between major urban and other areas

Classification of areas into 'major urban' and 'other' generally follows the convention of the State or Territory health authority providing the information to the Institute, and has varied a little between years. In 1989–90, the only areas apart from the capital cities classified as major urban were Newcastle, Wollongong, Geelong and Launceston.

Admission rates to hospitals in major urban areas are slightly greater than those to hospitals in other areas (Table 3.13). However, patients in hospitals outside the major urban areas tend to have longer stays—on average 5.9 days compared with 5.5 days for those admitted to hospitals in major urban areas. These differences mean that, on average, the bed-day use per 1,000 population is 4 per cent higher for hospitals outside the major urban areas areas than for those in major urban areas.

Table 3.13: Use of acute hospitals[a] by hospital location, 1989–90

	Major urban	*Other*	*Ratio*
Admissions (per 1,000 population)[b]	224	220	1.02
Bed-days (per 1,000 population)[b]	1,237	1,291	0.96
Average length of stay (days)[b]	5.5	5.9	0.93
Non-nursing home type patient bed-days (per 1,000 population)[c]	1,222	1,115	1.10

(a) Includes Department of Veterans' Affairs and private psychiatric hospitals.

(b) Data for Tasmanian private hospitals were excluded.

(c) Estimated. See Box 3.3.

Source: Australian Institute of Health and Welfare

Use of acute hospitals by non-acute inpatients

While the main role of an acute hospital is to provide short-term care for patients with either acute or chronic illness, the lack of long-term care facilities in some communities means that acute hospitals are also required to treat long-term patients with chronic conditions. These patients (traditionally called nursing home type patients—see Box 3.3) require nursing or rehabilitation care, but at a less intensive level than do acute patients.

Box 3.3: Nursing home type patients

The health care needs of people admitted to public acute hospitals for long periods are assessed after the first 35 days of admission. Those people assessed as not requiring continuous acute care are classified as nursing home type patients. After this assessment, the status of those requiring acute care is re-assessed every 30 days until the patient leaves the hospital or becomes a nursing home type patient.

Typically, nursing home type patients are older people, often with extended stays in hospital. The term nursing home type patient does not mean that the patient is necessarily eligible for admission to a nursing home, as nursing home admission requires geriatric assessment.

Within major urban areas, nursing home type patients typically use less than 5 per cent of hospital bed-days, and even less in teaching hospitals (Table 3.14). Hospitals outside the major urban areas, however, frequently have over 20 per cent of bed-days used by nursing home type patients, which largely reflects the lesser availability of alternative care such as nursing homes and community nursing. Despite the relatively higher use of hospital bed-days in these areas for nursing home type care, there is little evidence to suggest that this care is causing problems for patients in gaining admission for acute care. In 1987–88, the overall occupancy level for hospitals outside the major urban areas was 61 per cent (Gillett et al. 1991). The levels varied between States and Territories, but in New South Wales, for example, the overall level was 70 per cent, compared with an occupancy rate of 54 per cent excluding nursing home type patients (Table 3.14). This suggests that there is a significant capacity for these hospitals to provide additional acute care. Discharging all non-acute patients would result in very low levels of occupancy in hospitals outside the major urban areas (Table 3.14) and, with low or negative population growth rates in these areas, lead to under-utilisation of available facilities.

Table 3.14: Occupancy rate(a) and occupied bed-days classified as nursing home type, States(b) and Territories by location and type of hospital, 1987–88

(Per cent)

Use / Hospital type	*NSW*	*Vic*	*Qld*	*SA*	*Tas*	*ACT*	*NT*
Occupancy							
Major urban							
Teaching	86.8	79.6	72.9	87.5	63.7	(c)	(c)
Base	77.5	83.4	64.8	79.6	42.0	(c)	(c)
Other	66.7	74.5	58.7	64.1	47.8	(c)	(c)
All	77.8	79.6	71.1	84.6	59.5	72.1	87.6
Other	54.3	59.1	40.5	38.5	47.1	(c)	(c)
Nursing home type occupied bed-days(d)							
Major urban							
Teaching	0.4	0.9	1.5	—	2.5	(c)	(c)
Base	0.8	3.6	7.9	0.3	4.3	(c)	(c)
Other	1.4	6.2	5.8	2.4	0.4	(c)	(c)
All	3.9	2.9	2.7	0.2	14.4	5.3	2.8
Other	22.6	14.3	17.8	37.4	20.4	(c)	2.0

(a) Nursing home type occupied bed-days have been excluded from these occupancy rates.

(b) No data available for Western Australia.

(c) Inadequate cell size or no hospitals.

(d) Per cent of all occupied bed-days.

Source: Australian Institute of Health 1988

The levels of bed supply and bed-day use in hospitals outside the major urban areas (Tables 3.8 and 3.13) are consistent with what is known as Roemer's law (that is, use increases with the supply of facilities). However, if bed-days associated with nursing home type patients are excluded, these hospitals use fewer bed-days than hospitals in major urban areas (Table 3.13). Therefore, the higher use of hospitals outside major urban areas relates more to their extended care role than to the provision of acute care. It is arguable that the use of acute hospital beds to fulfil this extended care role is a practical alternative to the construction of separate facilities, as long as the care provided is appropriate in terms of type and quality.

Another alternative is the provision of non-acute care for older people in their own homes, and it has been proposed that such care be expanded (HHCS 1991a). The changes recommended would require an increase in the proportion of aged care expenditure devoted to home and community care programs—from 17.6 per cent in 1991 to 24.8 per cent in 2001.

Use of acute hospitals by older people

People aged 60 years or over, who comprise slightly more than 15 per cent of the population, account for more than 30 per cent of all hospital admissions (Table 3.15). The average duration of hospital stay also increases with age, with the result that people aged 60 years or over use almost 51 per cent of all hospital bed-days. People aged 80 years or over, who comprise about 2 per cent of the population, account for 6 per cent of all admissions and 16 per cent of total bed-day usage.

For people aged less than 80 years, the increased time spent in hospital largely results from the higher proportion of patients admitted with more complicated conditions (or with a more complex mix of conditions) (AIHW unpublished). However, in explaining the increased length of stay for people aged 80 years or over, the nature of the conditions is less important than other factors, such as lack of social and/or community support for people with reduced levels of daily living skills, a lack of alternative health care or residential accommodation, and differences in the perceptions of the amount of care required by people in different age groups (Gillett, Renwick, Liu 1991).

Over recent years, admission rates for older people have increased while rates for people under 65 years of age have decreased (AIH 1990; Gillett, Harvey 1989). Together with the ageing of the population, this is resulting in an increased proportion of hospital resources being used by older people. Consequently, with increasing numbers of patients admitted for conditions associated with ageing, hospital casemix can be expected to change.

This changing casemix will be most evident for hospitals outside the major urban areas, since the proportion of hospital bed-days used by older people is greater in these areas than in major urban areas. For hospitals outside the major urban areas, people aged 80 years or over use 21 per cent of all bed-days, compared with 13 per cent of bed-days for hospitals in major urban areas (Table 3.16). This difference is consistent with the higher numbers of nursing home type patient bed-days used in the former areas.

Table 3.15: Use of acute hospitals by older people, 1988–89[a]

Age group (years)	*Admissions*	*Bed-days*	*Average length of stay*
	(Per cent)	*(Per cent)*	*(Days)*
Less than 60	69.6	49.4	4.1
60–64	6.5	6.9	6.2
65–69	6.7	8.3	7.2
70–74	6.0	9.2	8.9
75–79	5.3	10.4	11.4
80–84	3.5	8.4	14.0
85 and over	2.5	7.5	17.2
60 and over	30.4	50.6	9.6
All ages	100.0	100.0	5.8

(a) Aggregated data from State collections. Includes 1989–90 data for Western Australia, 1988–89 data for New South Wales, Victoria, and South Australia, and 1989 data for Queensland. Excludes Department of Veterans' Affairs hospitals and Victorian private hospitals.

Sources: Gillett et al. 1991
Gillett, Renwick, Liu 1991

Table 3.16: Bed-day use by age group and location of hospital, 1988–89[a]
(Per cent)

	Hospital location		
Age group (years)	*Major urban*	*Other*	*Total*
Less than 60	53	43	49
60–79	34	36	35
80 and over	13	21	16
All ages	100	100	100

(a) Aggregated data from State collections. Includes 1989–90 data for Western Australia, 1988–89 data for New South Wales, Victoria, and South Australia, and 1989 data for Queensland. Excludes Department of Veterans' Affairs hospitals and Victorian private hospitals.

Source: Gillett et al. 1991
Gillett, Renwick, Liu 1991

Use of long stay institutions—psychiatric hospitals

As noted in Section 3.4, the move during the mid-1980s towards the care of many psychiatric patients outside hospitals resulted in substantial changes in the availability of designated psychiatric beds. Following the marked declines in admission rates and bed-day use for public psychiatric hospitals that occurred during that period, the rates have since stabilised.

In 1989–90, the admission rate for public psychiatric hospitals was 2.3 per 1,000 population, which is higher than the rate for 1987–88, but well below the 1985–86 level of 4.0 (Table 3.17). The number of bed-days used in public psychiatric hospitals in 1989–90 (149 per 1,000 population) was about the same as the number used in 1987–88 (150), and well below the 1985–86 number (275). Since 1987–88, bed occupancy has been about 80 per cent, slightly less than the 1985–86 level of 85 per cent.

Interstate comparisons of institutional use for psychiatric illness are even more complicated than comparisons for acute hospitals—the States and Territories differ in the extent to which they use special psychiatric hospitals and the acute hospital system to treat psychiatric illness, and also the extent to which people with developmental disabilities are counted as receiving psychiatric care. Also, admission rates are affected by discharge policies. For example, in 1985–86, South Australia reported the highest admission rate for public psychiatric hospitals, but had a relatively low bed-day rate. The high admission rate was likely to have been due to re-admissions after periods of short-term leave.

Table 3.17: Use of public psychiatric hospitals, States[a], 1985–86 to 1989–90

	NSW	*Vic*	*Qld*	*WA*	*SA*	*Tas*	*Australia*
1985–86							
Admissions (per 1,000 population)[b]	4.3	5.3	1.8	2.1	7.2	1.2	4.0
Bed-days (per 1,000 population)	352	317	177	107	199	510	275
Occupancy (per cent)	80	95	85	81	78	94	85
1987–88							
Admissions (per 1,000 population)[b]	1.9	2.7	0.5	1.5	3.1	0.7	1.9
Bed-days (per 1,000 population)	131	201	147	90	165	241	150
Occupancy (per cent)	74	76	88	75	80	89	78
1989–90							
Admissions (per 1,000 population)[b]	3.4[c]	2.5	0.5	1.6	3.3	0.7	2.3
Bed-days (per 1,000 population)	151[c]	183	143	84	155	183	149
Occupancy (per cent)	77	84	88	69	82	94	81

(a) ACT and NT have no public psychiatric hospitals.

(b) Estimated from separations.

(c) Includes some patients formerly counted with acute hospitals.

Source: Australian Institute of Health 1988

Use of long stay institutions—nursing homes

In 1987–88, the bed-day use in nursing homes for the aged was 1,553 per 1,000 population (Table 3.18), or 21,911 per 1,000 population aged 70 years and over. The bed-day use for 1989–90 was slightly lower—1,508 per 1,000 population, or 20,923 per 1,000 population aged 70 years and over. This represents a 2 per cent annual fall in bed days per 1,000 persons aged 70 years and over. These small reductions reflect partly the policy of caring for less dependent persons in their own homes or in hostels (see 'Institutional and community health services', page 10), and the subsequent shift in bed provisions.

In general, people outside the major urban areas have less access to and make less use of nursing homes for the aged than do those living in the major urban areas (Tables 3.8 and 3.18). In 1987–88, nursing homes outside the major urban areas provided 1,102 bed-days per 1,000 population, compared with 1,759 for major urban areas. Even allowing for the additional extended care role of 180 bed-days per 1,000 population of hospitals outside the major urban areas, the level of aged care in these areas is only about 70 per cent of that available in major urban areas.

Table 3.18: Total occupied bed-days in nursing homes for the aged, by location[a], States and Territories, 1987–88

(Per 1,000 population)

Location	*NSW*	*Vic*	*Qld*	*WA*	*SA*	*Tas*	*ACT*	*NT*	*Australia*
Major urban	2,014	1,319	2,068	1,728	2,217	1,731	395	190	1,759
Other	1,206	1,286	1,128	668	634	1,304	—	402	1,102
Total	1,803	1,310	1,550	1,422	1,788	1,578	395	298	1,553

(a) Rates are based on location of institution, not patient's place of residence.

Sources: Department of Health, Housing and Community Services (unpublished)
Australian Institute of Health and Welfare

3.6 Medical services

Services provided by doctors for patients are a central component of health care in Australia. These services are provided in a variety of settings, with some 82 per cent being provided by private medical practitioners, and the remainder largely by salaried and contracted staff of public hospitals.

Under Medicare (see 'Paying for personal health care', page 14), all Australians are eligible for benefits for services received as private patients and for free inpatient and other treatment received in public hospitals as public patients. The costs of public treatment are included in hospital expenditures in health expenditure statistics (see Section 3.1), and details of their composition and use over time are not available routinely.

Some types of medical services are not eligible for Medicare benefits. These include services to eligible military service veterans and dependants, services covered by motor vehicle third party and workers compensation schemes, services provided by public authorities and most government-funded community health services, and services not necessary for patient care (for example, examinations for employment purposes).

It has been estimated that 179.4 million medical services were provided to patients in 1987–88 (derived from Deeble 1991). Of these, 134.2 million services (75 per cent of all medical services) were eligible for Medicare benefits. A further 32.2 million medical services (18 per cent) were provided to inpatients in public and repatriation hospitals and to non-inpatients of public hospitals. Veterans received 5.1 million medical services outside hospital (2.8 per cent), and an estimated 5.9 million services (3.3 per cent) were provided for workers compensation or motor vehicle third party purposes. Public laboratories and community services were estimated to have provided 2.0 million services (1.1 per cent).

Thus, claims for Medicare benefits provide information about three-quarters of medical services delivered in Australia. The following sections summarise:

- the overall use of medical services covered by Medicare, by type of service (for example, general practitioner and specialist services);
- variations in use by age and sex;
- variations in use by State and region, with attention to the relationship between doctor supply and the use of services;
- methods of payment for medical services; and
- the relative use of services by area of residence grouped according to socioeconomic status.

The main sources of data for these sections are two studies undertaken as part of the National Health Strategy (Deeble 1991; McClelland 1991), analyses undertaken by the Institute of data aggregated from the Medicare claims file (maintained by HHCS), and the Annual Reports of the Health Insurance Commission (HIC).

In particular, the sections draw on Dr John Deeble's analysis of a 10 per cent patient sample derived by HHCS from the Medicare claims data (Deeble 1991). This analysis took account of the difficulties posed by the periodic changes to the items eligible for reimbursement under Medicare.

The following sections focus on the use of medical services, and generally do not include information on the non-medical services covered by Medicare (particularly optometry services). It should be noted also that some variation occurs in the figures presented, which results from the different ways of extracting the data—especially from analysis of services according to date of provision of the medical service as against date of processing of the claims for benefit.

This analysis of medical services concludes with a summary of a study analysing interstate and intrastate variations in surgery rates.

Use of private medical services covered by Medicare

In 1989–90, there were 150.8 million medical services provided under Medicare (Table S54, page 349) (Deeble 1991). On average, each person received 4.9 services from general practitioners (56 per cent of all medical services), 2.0 pathology services (23 per cent of all services) and 0.8 specialist consultations (9 per cent of all services) (Table 3.19).

The average use of medical services conceals a wide range of variation. In 1989–90, 17 per cent of all people enrolled in Medicare used no services and a total of 50 per cent used less than five services (including optometry services, which are not included in the average numbers of services quoted above) (Health Insurance Commission 1991). Thirteen or more services were used by 20 per cent of people enrolled, and 1.1 per cent used more than 50 services.

Between 1984–85 and 1989–90, total use of medical services increased by 6.0 per cent per year (Table S54, page 349). This increase was due mainly to the combined effect of population growth and a rise in the number of services provided per person, and to the increased provision by the private sector of services previously delivered to non-inpatients of public hospitals. The average use of medical services per person increased by 23 per cent—from 7.1 services in 1984–85 to 8.8 in 1989–90—an average annual increase of 4.3 per cent (Table 3.19). This average annual increase is somewhat greater than the annual growth rate of 3.5 per cent observed over the 10-year period 1976 to 1986 (Barer et al. 1990).

The change in average use per person between 1984–85 and 1989–90 varied significantly between types of service (Table 3.19). Of six broad types of medical service, pathology services (after allowing for changes to the pathology schedule) had the highest average annual increase at 7.3 per cent. The only other type of service to exceed the overall average of 4.3 per cent per annum was radiology (4.8 per cent per annum). While there was also substantial growth in surgery, it was masked in these figures by a revision of the Medicare schedule (Deeble 1991:25).

Table 3.19: Medical services use per capita by broad type of service, 1984–85 to 1989–90

	Services per capita					
	1984–85		*1989–90*			
Type of service	*Number*	*Per cent*	*Number*	*Per cent*	*Total increase*	*Annual increase*
					(Per cent)	*(Per cent)*
GP consultation	4.11	58	4.93	56	20.0	**3.7**
Specialist consultation	0.67	9	0.78	9	16.4	**3.1**
Pathology[(a)]	1.41	20	2.01	23	42.6	**7.3**
Radiology	0.30	4	0.38	4	26.7	**4.8**
Operations	0.20	3	0.24	3	20.0	**3.7**
Other[(b)]	0.45	6	0.46	5	2.2	**0.4**
Total	**7.14**	**100**	**8.80**	**100**	**23.2**	**4.3**

(a) Pathology service use was estimated on pre-1989 schedule structure.

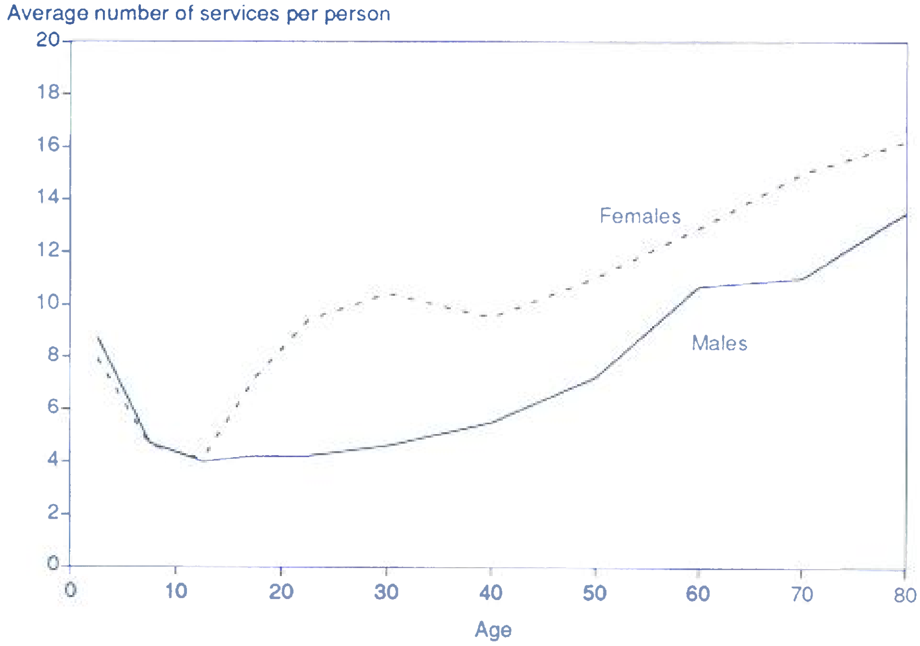
(b) Includes the 'Miscellaneous' part of the Medicare Benefits Schedule.

Source: Deeble 1991

Use of medical services by age and sex

The use of medical services covered by Medicare varies substantially by age and sex. For services processed by HIC in 1990–91, average use was 6.5 services per enrolled male and 9.9 services per enrolled female. Average use by females exceeded that by males for all age groups except 0 to 4 years and 5 to 9 years (Figure 3.12).

Figure 3.12: Average number of medical services processed per Medicare-enrolled person, by age and sex, 1990–91



Source: Health Insurance Commission 1991

Refer to Appendix 1, Table A32

For services rendered in 1989–90, 21 per cent of enrolled males and 12 per cent of enrolled females did not use a medical service, and 14 per cent of males and 26 per cent of females used 13 or more services (Health Insurance Commission 1991). The age group for which the highest proportion of males did not use a medical service was 20 to 24 years (28 per cent), followed by 25 to 34 years (26 per cent) and 65 years and over (25 per cent). In contrast, the highest proportion of females not using a medical service was for the 75 years and over age group (20 per cent), followed by those aged 5 to 9 years (19 per cent). The surprisingly low proportions of older people using medical services may reflect their high levels of hospitalisation as public patients, as well as higher proportions in these age groups being eligible for treatment as veterans (or as their dependants).

A detailed analysis of the use of private medical services in 1989–90 found that people aged 60 years or older used an average of 15.2 services per person, compared with 8.7 services for people aged between 20 and 59 years, and 5.9 services for those aged less than 20 years (Table 3.20). Average use of services by females was higher than that by males for each of these broad age groups, and the differences were particularly wide in the 20 to 59 year group.

Table 3.20: Medical services, use per capita by type of service, age group and sex, 1989–90

(Number of services)

Age group / Type of service	*Males*	*Females*	*Persons*
Less than 20 years			
GP consultations	4.01	4.39	4.19
Specialist consultations	0.48	0.46	0.47
Pathology[a]	0.58	0.96	0.77
Radiology	0.22	0.20	0.21
Operations	0.14	0.10	0.13
Other	0.16	0.18	0.17
All types	5.58	6.29	5.93
20 to 59 years			
GP consultations	3.46	5.57	4.50
Specialist consultations	0.57	1.08	0.82
Pathology[a]	1.29	3.30	2.28
Radiology	0.34	0.44	0.39
Operations	0.21	0.30	0.25
Other	0.27	0.67	0.47
All types	6.13	11.36	8.70
60 years and over			
GP consultations	6.52	9.23	8.02
Specialist consultations	1.53	1.72	1.63
Pathology[a]	3.20	3.79	3.53
Radiology	0.75	0.83	0.79
Operations	0.45	0.45	0.45
Other	0.71	0.72	0.72
All types	13.16	16.74	15.15
All age groups / All types	**6.92**	**10.77**	**8.85**

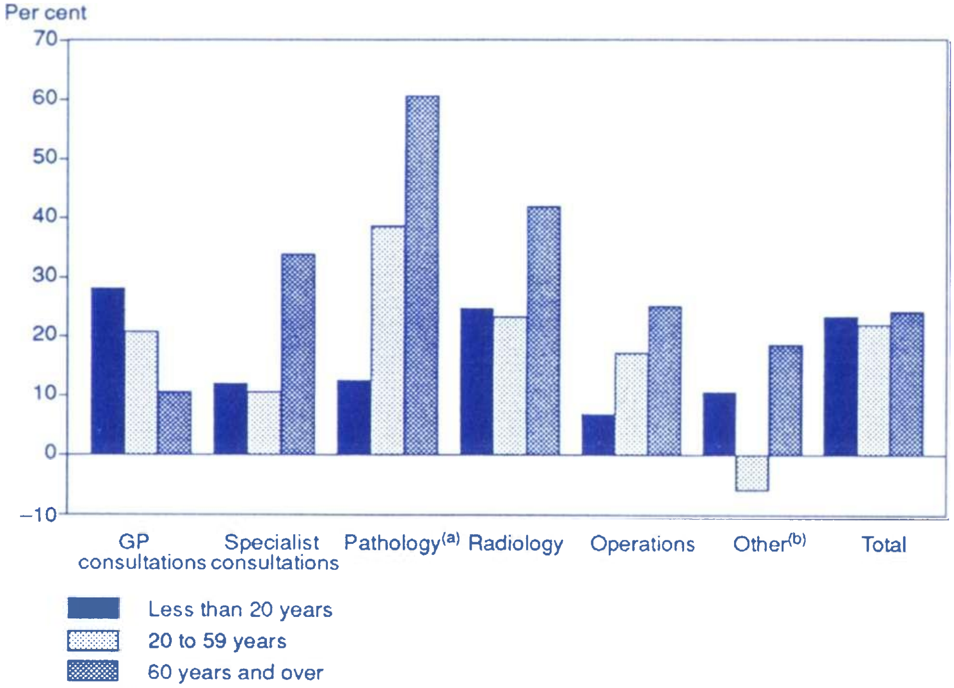
(a) Pathology service use was estimated on pre-1989 schedule structure.

Source: Deeble 1991

There were also substantial differences in the proportions of various services used by males and females of different ages. For males, the proportionate use of general practitioner services decreased with age, from 72 per cent of services for the less than 20 year age group, to 56 per cent for the 20 to 59 year group, to 50 per cent for the 60 years and over group. For females, the proportionate use of general practitioner services was lowest for the age group 20 to 59 years, largely reflecting the much higher use of pathology services by women in that group. For both sexes and each age group, after general practitioner services the second most frequent type of services were pathology services. The average number and the proportion who used specialist consultations increased with age for both males and females.

Between 1984–85 and 1989–90, the increase in the use of services by all age groups was similar—between about 22 to 24 per cent—although there was considerable variation across broad types of service (Figure 3.13). As was found in an analysis of trends between 1976 and 1986, people aged 60 years or older had higher rates of increase for all types of specialist service than did the younger age groups (Barer et al. 1990). In contrast, the average use of general practitioner services rose most slowly for people aged 60 years or older and most rapidly for those aged 19 years or younger.

Figure 3.13: Percentage change in per capita use of medical services by age and type of service, 1984–85 and 1989–90



(a) 1989–90 pathology service use was estimated on pre-1989 schedule structure.

(b) The decline in per capita use reflects the deletion of venepuncture and intravenous drip items from the Miscellaneous procedures section of the Medicare Benefits Schedule.

Source: Deeble 1991

Refer to Appendix 1, Table A33

State and regional variations in use of services

The use of medical services varied substantially between the States and Territories (Figure 3.14). With an average of 9.8 services per person in 1989–90, the use of medical services in New South Wales and the Australian Capital Territory combined was more than 11 per cent above the national average (Deeble 1991). Given a comparatively low use of medical services in the Australian Capital Territory (McClelland 1991), the combined figure slightly underestimates the difference in use between New South Wales and the average of the other States, which was about 19 per cent (Deeble 1991). Western Australia, with an average of 7.5 services per person, had the lowest use of medical services.

These differences between States and Territories partly reflect differences in the level of medical care provided by the public sector and in the mix of public and private treatment of hospital patients. This may occur because, as noted above, services to 'public' patients in public hospitals do not attract a Medicare benefit and are not included in the rates presented above on private medical use. As well, allowances have not been made for differences in the age structures of the populations.

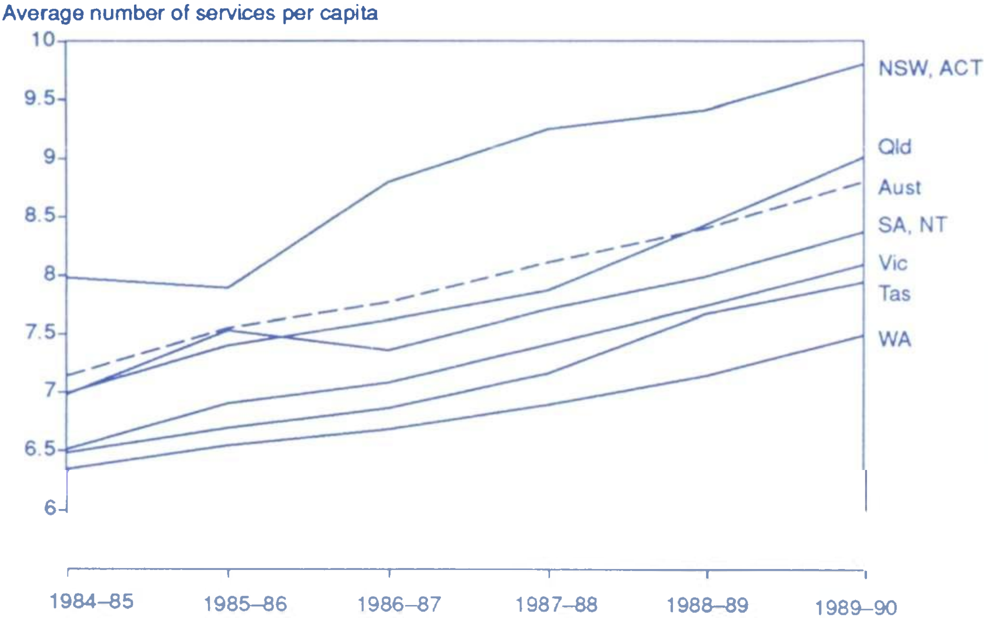
However, an analysis by the Institute of out-of-hospital services (that is, excluding services rendered to hospital inpatients) revealed a similar pattern of per capita use in the States and Territories. The use of services in 1989 was highest in New South Wales at 14 per cent above the national average (Table 3.21). The use of private out-of-hospital services in Queensland in 1989 was equal to the national average, with use in all other States and Territories being below the average. In contrast to New South Wales, where the use of all of the broad types of services exceeded the national average, higher than average use was found in Queensland only for pathology and 'other' services (mainly diagnostic services, ultrasound, ECG and nuclear medicine) (Table 3.21).

Between 1986 and 1989, the per capita use of out-of-hospital services increased 11 per cent nationally. The increase was highest in the Northern Territory (22 per cent) and Queensland (17 per cent), and lowest in Western Australia and South Australia (each 7 per cent) (Table 3.21). Even with the large percentage increases, per capita use of out-of-hospital services in the Northern Territory is still very low compared with the States and the Australian Capital Territory. On the other hand, the increases for Queensland have lifted per capita use of out-of-hospital services in that State to slightly above the national average.

A comparison undertaken by the Institute of regional differences in per capita use of private medical out-of-hospital services in 1989 revealed considerable variation. Service use was highest in the State capitals (8.7 services per person), and lowest in areas other than the State capitals and provincial cities (6.7 services per person). 'Provincial' cities (cities other than State capitals, with populations exceeding 100,000—for example, Newcastle, Canberra and Townsville) had an intermediate level of service use (7.9 per person). This variation in service use between urban and other areas is of the same order of magnitude as the variation between States.

Between 1986 and 1989, the per capita use of private medical out-of-hospital services increased by a similar magnitude for urban and other areas—11.3 per cent compared with 10.6 per cent.

Figure 3.14: Medical services, use per capita by States and Territories[a], 1984–85 to 1989–90



(a) NSW data includes ACT, SA data includes NT.

Source: Deeble 1991

Refer to Appendix 1, Table A34

Table 3.21: Out-of-hospital medical services per capita by broad type of service, 1986 and 1989

(Number)

Type of service	*NSW*	*Vic*	*Qld*	*WA*	*SA*	*Tas*	*ACT*	*NT*	*Aust*
1986									
GP	4.8	4.0	3.8	3.6	4.3	4.0	3.4	2.3	4.2
Specialist	0.8	0.6	0.5	0.5	0.7	0.5	0.6	0.2	0.6
Pathology	1.6	1.2	1.5	1.2	1.1	1.1	1.1	1.3	1.4
Radiology	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.3
Other	0.6	0.4	0.5	0.5	0.5	0.4	0.4	0.2	0.5
All services	8.1	6.4	6.7	6.2	7.0	6.3	5.7	4.1	7.0
1989									
GP	5.4	4.5	4.7	4.0	4.8	4.6	4.0	2.9	4.8
Specialist	0.8	0.7	0.6	0.5	0.7	0.6	0.6	0.3	0.7
Pathology	1.8	1.3	1.7	1.3	1.2	1.3	1.2	1.4	1.5
Radiology	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3
Other	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.2	0.4
All services	8.9	7.1	7.8	6.6	7.4	7.1	6.5	5.0	7.8
Per cent increase 1986 to 1989									
GP	13	13	23	10	11	14	19	26	14
Specialist	5	11	8	1	9	13	2	46	7
Pathology	7	10	9	6	5	19	9	9	8
Radiology	13	11	22	12	2	21	16	86	13
Other	–6	–4	–1	–11	–25	–11	–5	–4	–7
All services	10	11	17	7	7	14	13	22	11

Source: Department of Health, Housing and Community Services (unpublished)

The relationship between doctor supply and the use of services

The per capita supply of private medical practitioners is one factor influencing State and regional differences in the use of services, although it is believed to account for only about half the variation (Richardson 1981). The remainder of the variation is probably due to differences in clinical practice reflecting different opinions about appropriateness (Harvey 1991).

Assessment of the relationship between the per capita supply of doctors and the use of services is complicated by the wide range of activity of private medical practitioners providing services under Medicare. One way of addressing this problem is to group practitioners billing for at least one service according to annual gross schedule fee levels, with those having a gross Medicare income of less than $61,000 per annum in 1989–90 being classified as part-time and the remainder as full-time (Deeble 1991).

Since private medical practitioners classified as full-time according to this definition provided nearly 95 per cent of all services and accounted for 94 per cent of total fees in 1989–90, the following discussion focuses on the relationship between State and Territory variations of full-time medical practitioners and the use of medical services.

In 1989–90, New South Wales had the highest per capita supply of full-time private medical practitioners (general practitioners and specialists), with 130 per 100,000 population (Table 3.22), followed by South Australia (125) and Victoria (116). As noted above, use of medical services was highest in New South Wales, followed by Queensland and South Australia (Figure 3.14; Appendix 1, Table A34).

Overall, there is a strong relationship between the number of full-time private medical practitioners per 100,000 population and the per capita use of out-of-hospital medical services (Figure 3.15). There is an even stronger relationship between numbers of full-time general practitioners and per capita use of services (Figure 3.16).

The number of full-time general practitioners per 100,000 was about 22 per cent higher in metropolitan than in non-metropolitan areas of Australia (Table 3.22), and the difference in per capita service use was about 28 per cent. The number of full-time specialists per 100,000 in metropolitan areas was more than twice that in non-metropolitan areas.

Table 3.22: Full-time medical practitioners[a] by States and Territories and region[b], 1989–90

(Per 100,000 population)

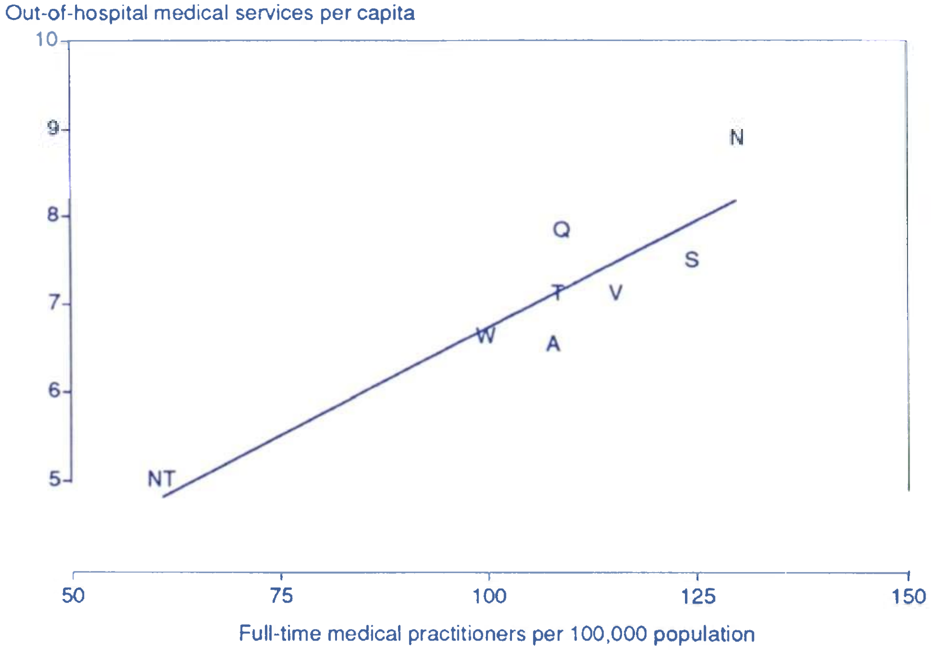
	Full-time general practitioners			*Full-time specialists*		
State / Territory	*Metro*	*Non-metro*	*Total*	*Metro*	*Non-metro*	*Total*
NSW	82	66	76	64	37	54
Vic	69	58	66	58	30	50
Qld	77	62	69	54	28	40
WA	65	49	61	49	11	39
SA	81	66	77	63	8	48
Tas	76	68	71	57	25	38
ACT	57	na	57	51	na	51
NT	61	18	38	41	7	23
Australia	75	62	70	59	28	48

(a) 'Full-time' medical practitioners are defined here by total Medicare schedule fees greater than $61,000 for the financial year 1989–90.

(b) The State, Territory and region (of medical practitioners) are determined from the postcode of the major practice.

Source: Department of Health, Housing and Community Services (unpublished)

Figure 3.15: Relationship of out-of-hospital medical services per capita to number of full-time medical practitioners, 1989–1990[(a)]



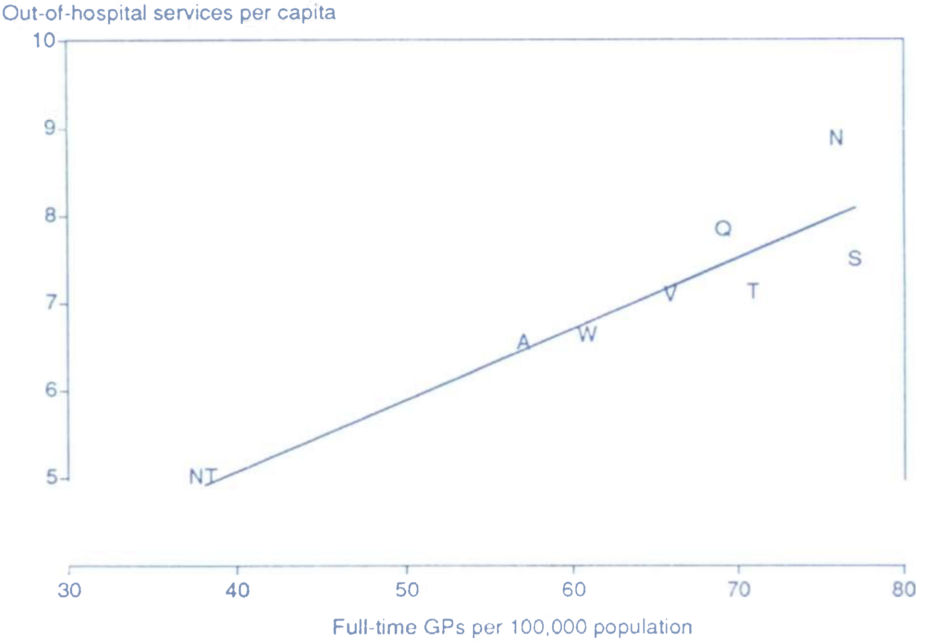
N	New South Wales	S	South Australia
V	Victoria	T	Tasmania
Q	Queensland	A	Australian Capital Territory
W	Western Australia	NT	Northern Territory

(a) Use of services are to 1989 and number of medical practitioners per population are for 1989–90.

Source: Department of Health, Housing and Community Services (unpublished)

Refer to Tables 3.21 and 3.22

Figure 3.16: Relationship of out-of-hospital medical services per capita to number of full-time general practitioners, 1989–1990(a)



N	New South Wales	S	South Australia
V	Victoria	T	Tasmania
Q	Queensland	A	Australian Capital Territory
W	Western Australia	NT	Northern Territory

(a) Use of services are to 1989 and number of GPs per population are for 1989–90.

Source: Department of Health, Housing and Community Services (unpublished)

Refer to Tables 3.21 and 3.22

Payments for medical services covered by Medicare

In 1989–90, total payments for private medical services was $4,461 million, of which $3,733 million was for benefits paid by Medicare (Table 3.23). (Note that the figures presented here differ slightly from those presented in earlier sections, as these data relate to the date of processing of the claims for benefit, whereas the earlier figures relate to date of provision of the medical service.)

The difference between fees charged ($4,461 million) and schedule fees ($4,450 million) represents the net above schedule fee component of 0.3 per cent. Patient billed services (that is, excluding direct billed services) totalled $2,663 million, with Medicare benefits paid of $1,926 million. For these services, the net above schedule fee component was 14 per cent.

Total patient fees and benefits varied with the type of service provided. Fees for consultations with general practitioners totalled $1,659 million and those with specialists $693 million. Benefits covered 90 per cent of fees charged for general practitioner consultations, and 83 per cent of fees charged for specialist consultations.

For services processed in 1990–91, 60 per cent of all medical services were direct billed, substantially higher than the proportion in 1984–85 of 45 per cent (Table 3.24). Between 1984–85 and 1990–91, the proportion of direct billed general practitioner services increased from 53 to 70 per cent, while the proportion of specialist consultations direct billed increased only from 22 to 26 per cent.

There is considerable variation between the States and Territories in the proportions of services being direct billed. For all medical services, the highest levels in 1990–91 were in New South Wales, where 65 per cent were direct billed. Levels were lowest for the Australian Capital Territory, where only 46 per cent of all services were direct billed.

The pattern of direct billing for general practitioner services was similar to that for all medical services, with New South Wales having the highest proportions (76 per cent) and the Australian Capital Territory the lowest (56 per cent). Direct billing for specialist consultations was highest in the Northern Territory (37 per cent), followed by New South Wales (31 per cent). Again, the Australian Capital Territory had the lowest proportion of direct billing (15 per cent).

The slightly atypical patterns of direct billing for medical services in the Northern Territory probably reflect the Territory's particular balance between private medical practice and community health and hospital services, and the higher proportion of Aborigines in the population.

Table 3.23: Aggregate costs of private medical services, 1989–90[a]

	All services				*Patient billed services only*			
Type of service	*Services*	*Fees charged*	*Benefits*	*Schedule fees*	*Services*	*Fees charged*	*Benefits*	*Schedule fees*
	(m)	*($m)*	*($m)*	*($m)*	*(m)*	*($m)*	*($m)*	*($m)*
GP consultations	84.2	1,659.0	1,494.0	1,757.0	27.9	647.8	479.6	565.3
Specialist consultations	13.5	693.2	577.0	683.7	10.8	561.1	436.2	520.0
Obstetrics	0.6	82.8	48.7	63.3	0.5	80.1	46.0	60.1
Anesthetics	2.2	143.3	92.9	122.8	1.4	115.3	73.3	97.3
Pathology	26.0	648.7	554.5	661.8	10.8	325.1	230.9	281.3
Radiology	6.7	433.7	368.2	422.7	4.5	377.1	281.3	331.8
Operations	4.3	551.6	393.0	497.9	2.7	451.8	300.4	387.4
Other	4.8	249.0	204.4	240.7	1.9	105.0	77.8	95.5
All services	**142.4**	**4,461.4**	**3,732.7**	**4,449.9**	**60.4**	**2,663.4**	**1,925.5**	**2,338.7**

(a) Data are by date of processing.

Source: Department of Health, Housing and Community Services (unpublished)

Table 3.24: Proportion of medical services direct billed, States and Territories, 1984–85 and 1990–91

(Per cent)

	GP services		*Specialist services*		*All medical services*	
State / Territory	*1984–85*	*1990–91*	*1984–85*	*1990–91*	*1984–85*	*1990–91*
NSW	60.5	76.1	26.3	31.0	49.9	65.3
Vic	46.6	64.6	18.4	21.5	40.1	54.6
Qld	50.3	72.0	17.9	20.4	45.6	62.4
WA	50.3	68.4	22.5	23.8	43.5	60.2
SA	48.0	65.7	23.3	26.3	41.3	55.8
Tas	42.2	58.7	17.5	19.4	35.5	49.1
ACT	30.2	55.7	9.8	15.3	20.9	46.4
NT	56.3	57.9	31.0	37.4	51.7	64.4
Australia	**52.6**	**70.3**	22.2	25.5	**44.8**	**60.4**

Source: Health Insurance Commission 1985, 1991

Socioeconomic disadvantage and the use of services

To assess the relationship between socioeconomic status and the use of medical services, McClelland (1991) combined the data available through Medicare (which includes postcode of residence of patient) with the index of relative socioeconomic disadvantage developed by ABS from information collected in the 1986 Census of Population and Housing (see Box 4.7, page 192).

This analysis revealed a trend to higher overall per capita service use for patients living in areas of greatest socioeconomic disadvantage, particularly among the older age groups (Tables 3.25 and 3.26). For specialist services, however, there was an opposite tendency: patients living in areas of greatest socioeconomic disadvantage had lower use (McClelland 1991).

Table 3.25: Medical services, use per capita by socioeconomic index deciles[a] and age group, males, 1989

	Age group (years)					
SEI deciles[b]	*0–4*	*5–19*	*20–44*	*45–59*	*60–74*	*75 and over*
875	7.7	4.3	6.3	7.4	9.5	12.2
947	6.5	3.7	5.4	6.3	8.4	10.8
973	6.8	3.7	5.4	6.1	8.0	10.5
991	6.3	3.5	5.0	5.6	7.4	9.9
1005	6.3	3.5	4.9	5.8	7.7	10.2
1019	6.4	3.6	5.0	5.5	7.5	10.7
1034	6.7	3.6	5.4	5.9	7.9	10.7
1051	6.9	3.8	5.2	5.4	7.2	9.5
1074	6.2	3.5	4.9	5.1	6.9	10.2
1116	7.0	3.8	4.9	5.0	6.2	9.9

(a) Low socioeconomic index (SEI) values indicate geographic areas of relatively low socioeconomic status.

(b) These are the mean SEIs of each decile which is a 10 per cent grouping of the postcodes when they are ranked in ascending order according to each postcode's SEI ranking.

Source: McClelland 1991

Table 3.26: Medical services, use per capita by socioeconomic index deciles[(a)] and age group, females, 1989

	Age group (years)					
SEI deciles[(b)]	*0–4*	*5–19*	*20–44*	*45–59*	*60–74*	*75 and over*
875	7.2	3.5	4.1	5.5	7.2	10.4
947	6.1	3.1	3.2	4.7	5.9	9.7
973	6.4	3.2	3.1	4.4	5.7	8.7
991	6.2	2.9	2.8	4.0	5.1	8.5
1005	6.0	3.0	2.9	4.1	5.7	8.7
1019	6.1	2.9	2.8	3.9	5.4	8.4
1034	5.9	3.2	3.1	4.0	5.8	9.6
1051	6.6	3.2	2.9	3.7	5.0	8.3
1074	6.2	3.1	2.8	3.5	4.5	8.3
1116	6.7	3.3	2.8	3.4	4.4	8.1

(a) Low socioeconomic index (SEI) values indicate geographic areas of relatively low socioeconomic status.

(b) These are the mean SEIs of each decile which is a 10 per cent grouping of the postcodes when they are ranked in ascending order according to each postcode's SEI ranking.

Source: McClelland 1991

Variations in rates of surgery

For some 20 years, it has been recognised in Europe and North America that the use of health services for specific illness conditions varies regionally, even between areas with similar population characteristics (Muller 1986).

Variations in surgery rates in the order of two- to four-fold have been attributed to differences in health status, differences in access to (and availability of) health services, personal health habits, and the values and attitudes of users and providers of health care. However, it is believed that the principal determinant of the variation is difference in doctors' practice styles, largely due to a lack of consensus about the most effective treatment for a particular condition (Leape 1989).

Generally, hospital admission rates for non-surgical conditions have been found to be more variable than rates for surgical procedures. However, the widespread debate in Australia in the early 1980s about variations in surgery rates prompted the Institute to examine the extent and pattern of variations in rates of nine common surgical procedures (Renwick, Sadkowsky 1991). The nine procedures examined were appendicectomy, cholecystectomy (removal of the gall bladder), tonsillectomy, hysterectomy, cesarean delivery, hip replacement, lens insertion (for cataracts), thyroidectomy, and bowel resection (for cancer). The rates of these procedures in 1986 were examined for variation by residence of patient by State and Territory (excepting Tasmania, for which the necessary information was not available), and by statistical division and subdivision. The focus of the study was on the extent of variation between and within States and Territories.

Rates for each procedure were produced based on the area of residence of patients (not on the location of the hospital where the service was provided). This required adjustment for surgery performed outside a person's State of residence. The crude rates for each procedure were also adjusted to take account of age and sex differences of the populations. The results are presented as ratios of these adjusted rates to the overall rate for each procedure. It should be noted that surgery rates may be affected by small numbers (both of populations and of the incidence of surgery), so large annual fluctuations can occur. Therefore, a one-year study can yield misleading results—a difficulty only overcome by longitudinal studies (for full details of the method and the limitations of the study, see Renwick, Sadkowsky 1991).

Variations between the mainland States in the ratios of the procedures were generally one and a half times or less—the main exception being tonsillectomy, for which procedure the difference was almost two-fold (Table 3.27). Inclusion of the two Territories, with much smaller populations, widens the variation for most procedures, bringing it to almost three-fold for hip replacement.

Variations of two- to four-fold were found generally between areas of residency within the mainland States (except Western Australia, for which State data at this level were not available) (Figure 3.17). The extent of variability was greatest in Queensland and least in South Australia, and higher in the Sydney metropolitan area than in the Melbourne metropolitan area (Figure 3.18). Generally, the ratios that prevailed in Victoria were lower than those in other States (Table 3.27, Figure 3.17).

The procedures with the most variation in rates by State and Territory of residence were hip replacement, tonsillectomy and lens insertion (Table 3.27). Unless there were great differences in the prevalence of underlying disease, such large variations in the rates for hip replacement and lens insertion would not be expected, as in each case most doctors agree that surgery is the optimal treatment for the underlying conditions. In the case of lens insertion, the prevalence of cataracts could be expected to show regional variation, as exposure to ultraviolet radiation is implicated in some cases. It seems possible, however, that the great variation in the rates for lens insertion and hip replacement could reflect access barriers of some kind. The variation in tonsillectomy rates is higher than expected, as clinical indicators for this operation had been developed before 1986.

Table 3.27: Surgical procedures, standardised ratios[(a)], States[(b)] and Territories, 1986

(Standardised ratio)

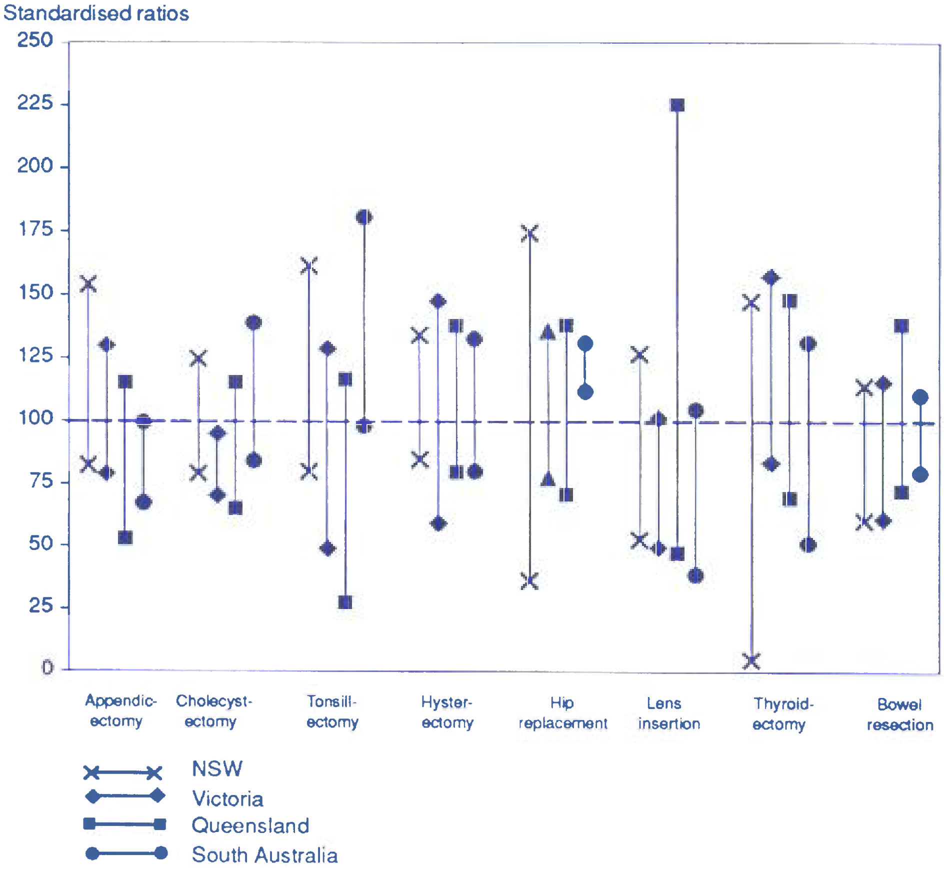
Procedure	*NSW*	*Vic*	*Qld*	*WA*	*SA*	*ACT*	*NT*
Appendicectomy	108	95	96	110	84	99	75
Cholecystectomy	105	87	104	92	120	111	93
Tonsillectomy	99	88	90	107	159	109	60
Hysterectomy	100	88	108	117	100	115	130
Cesarean section	98	93	111	95	102	143	145
Hip replacement	94	96	88	122	129	108	256
Lens insertion	112	74	116	110	87	158	68
Thyroidectomy	109	98	107	81	71	121	123
Bowel resection	98	100	103	105	101	87	73

(a) Ratio of State and Territory rates to the combined rates.

(b) No data for Tasmania.

Source: Renwick, Sadkowsky 1991

Figure 3.17: Range of standardised ratios(a) of surgical procedures across State statistical divisions, 1986

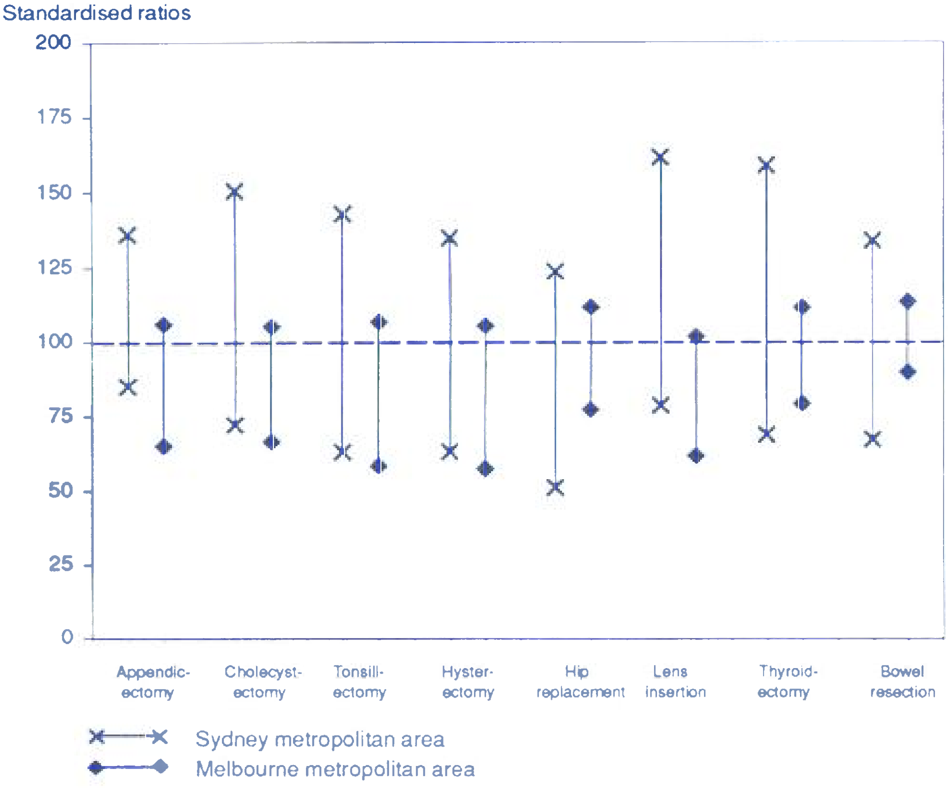


(a) Ratio of State statistical division rates to the combined value.

Source: Renwick, Sadkowsky 1991

Refer to Appendix 1, Table A30

Figure 3.18: Range of standardised ratios[(a)] of surgical procedures across Sydney and Melbourne metropolitan areas, 1986



(a) Ratio of Sydney and Melbourne rates to the combined value.

Source: Renwick, Sadkowsky 1991 *Refer to Appendix 1, Table A31*

Cesarean section

Standardised rates for cesarean section fail to take account of regional differences in fertility, so a better measure of this procedure is its incidence as a percentage of live births.

For mainland Australia, 16.9 cesarean sections were performed for every 100 live births (Table 3.28). There was an exceptionally high rate of cesarean delivery for residents of the Australian Capital Territory (26.3 per 100 live births) and higher than average rates for residents of the Northern Territory, Queensland and South Australia. Western Australian residents had the lowest rate.

Overall, the rates for residents of metropolitan and non-metropolitan regions differed only slightly (17.5 per cent and 15.3 per cent, respectively), and this probably reflects the distribution of specialist obstetricians. The rate for women with private health insurance was 19.4 per cent, compared with 13.7 per cent for women without private health insurance. This is a common finding, variously attributed to supply factors (for example, the ratio of obstetricians to the number of insured women, the type of insurance cover and the method of paying public sector medical practitioners), demand factors (for example, social expectations and affluence) or interaction between the two (Opit, Selwood 1979; Stafford 1991). The patterns found in this study suggest a direct relation with supply of resources. Another factor may be the pressure felt by obstetricians to practise 'defensive medicine'.

Table 3.28: Cesarean section rates[a], by private health insurance status, States[b] and Territories, 1986

(Per 100 births)

Women	*NSW*	*Vic*	*Qld*	*WA*	*SA*	*ACT*	*NT*	*All*
With private insurance	18.3	17.7	24.7	17.8	21.0	26.9	16.3	19.4
Without private insurance	12.9	14.6	13.5	12.3	14.5	24.4	21.7	13.7
All women	**16.0**	**16.5**	**18.4**	**15.1**	**18.2**	**26.3**	**19.8**	**16.9**

(a) Rates for 'All women' are per 100 live births. Rates for women by private insurance status are per 100 total births (including stillbirths).

(b) No data for Tasmania.

Source: Renwick, Sadkowsky 1991

Conclusions

A study of the type undertaken could not identify causal factors, but it raises a number of questions. Unless the differences in prevalence of underlying disease are greater than believed, the inference to be drawn from variations in practice patterns is that either in some regions inappropriate things are being done or, in others, things that should be done are being left undone (Renwick, Sax 1991). The reasons may be problems in resource distribution, access or quality of care—all equity issues. There are also implications for overall health expenditure. For example, if the generally lower than average rates documented for Victoria (without apparent adverse health status consequences) were to apply nationwide, health care costs could be significantly reduced without reduction in health status.

3.7 Health technologies

Health care technologies pervade all areas of health care. They provide benefits to many groups through the prevention and treatment of disease and disability, and by contributing to improvements in survival and quality of life. However, there is potential for inappropriate use, and continuing debate regarding the cost of technologies and their effects on allocation of resources. This section presents some issues related to health care technologies which are of current interest.

Expenditure on health technologies

For those technologies associated with use of complex devices, capital expenditure can be significant and may include a substantial component for upgrades in addition to start-up costs. However, recurrent expenditure, covering items such as staff and consumables, will often be more significant. For example, machine and site costs for magnetic resonance imaging (MRI) scanners used in an Australian trial ranged from $2.7 million to $4.5 million, cost of upgrades to each machine might be $50,000 to

$100,000 a year, while annual recurrent costs ranged from $500,000 to $1.24 million (National Health Technology Advisory Panel 1990a; Hailey, Crowe 1991).

Expenditure on the use of health care technologies in Australia is known to be substantial, but the precise extent is uncertain. Annual Medicare expenditure on health technologies has been estimated at about $1.88 billion (AIH 1991b). However, this relates only to some categories of technology and does not include, for example, expenditure on pharmaceuticals or information technology. There are difficulties in matching definitions of health care technology with current health care programs and services, and not all expenditure on health care technologies is readily captured using existing databases.

The use of new technology may represent a relatively minor part of total health care expenditure, but there are limits as to how much additional funding may be available. Inevitably questions will be asked as to whether the additional costs of particular technologies will be commensurate with the benefits they provide.

In Australia, as in other countries, a continuing trend is the substantial increase in use of diagnostic technologies. There is potential for improving health care through insights provided by the use of advanced diagnostic techniques. A challenge is to ensure that diagnostic methods are applied wisely and in situations where the expected diagnostic yield gives a realistic possibility of influencing patient management.

Recent advances in therapeutic technologies have generally had a limited effect on the longevity of the population as a whole, although they have been significant for specific groups, particularly in the treatment of some types of cancer. New therapeutic technologies may have a very significant impact on morbidity, reducing the trauma and discomfort to the patient and enabling an earlier return to normal activity. The introduction of less invasive surgical methods (see'The use of less invasive surgical procedures', page 153) has been an important advance.

For some types of disease, introduction of population screening linked to appropriate methodology and organisation can produce significant gains to health status. The application of screening for cervical cancer on a national basis is a notable example of a technology that could have major effects on survival. This technology, based on histological examinations of cervical smears, is well established but has been inadequately applied in many countries (see 'Cervical cancer', page 84).

Transplant technologies have also provided increased survival for people with some conditions. There is an opportunity cost to health services in providing such complex intervention, but there may be offset savings through avoidance of other procedures. For example, while liver transplant programs are expensive, with each case probably costing in excess of $100,000, there are good prospects of increased survival for most patients accepted into such programs under current selection criteria. In addition, the lengthy and expensive institutional care that would otherwise be required for such patients in their last few months of life may often be avoided (Australian Health Technology Advisory Committee 1991).

Technologies may have a most significant influence on the quality of life of patients, for example by increasing the independence of elderly or chronically ill patients from institutional care. Cataract surgery, hip prostheses and rehabilitation methods are examples of such technologies.

The growth of diagnostic services and their costs

The use of diagnostic technologies has contributed significantly to the increase in health care expenditure. In 1990–91, about 27.5 per cent of the total Medicare benefits paid for all services were for radiology services ($500.1 million), diagnostic endoscopy ($39.9 million) and pathology tests ($628.3 million). To an extent, this use reflects the powerful new techniques that have become available in recent years. These techniques have provided increasingly detailed anatomical and physiological information. However, their introduction has been accompanied by a very large increase in expenditure and, in some cases, new technologies have been additive to older methods. There are concerns regarding the appropriateness of use of diagnostic technologies in some applications, particularly with regard to impact on patient management (Crowe, Hailey 1990; Deeble 1991; NHMRC 1991).

It is difficult to quantify the cost-effectiveness of diagnostic technologies, as often these are used either to rule out or to confirm specific conditions. For example, in spite of the technical excellence of MRI, there are still relatively few data which firmly establish the effects of this new technology on patient management and eventual outcome (National Health Technology Advisory Panel 1990b). Further, the use of the technology for patient populations in which there is low disease prevalence is likely to result in limited diagnostic increment and effect on management decisions.

Medicare statistics show a large and steady increase in the use of computerised tomography (CT) since 1984–85, with 406,610 services recorded in 1990–91. This represents an increase of 136 per cent over the period. Increases of a similar order of magnitude have been observed for other diagnostic procedures such as ultrasound (148 per cent).

CT is an important technique, which can provide significant benefits to health care when it is appropriately used. However, guidelines for the appropriate use of CT were lacking until recently, and some patients may have been subjected to inappropriate investigations and to unnecessary risk. Guidelines have now been issued by NHMRC (1991). They include advice for medical practitioners on when it is appropriate to use the technology, and the risks, costs and expected benefits.

While the increase in CT services and consequent expenditure is a significant trend, this technology is used in only a minority of radiology services. In 1990–91, CT accounted for about 5 per cent of all radiology services funded through Medicare benefits, and for about 19 per cent of expenditure (AIH 1991b).

Some increases in expenditure have been due to the perceived need for greater safety. For example, developments in the use of new contrast media have increased the costs of radiology services. Contrast media have been used in radiological examinations for many years, but the new non-ionic media, although not regarded as more efficacious, are associated with less frequent adverse reactions. As these new contrast media cost between four and six times as much as conventional agents, there is debate on whether they should be used routinely during all intravenous radio contrast studies, or reserved for use in patients with risk factors for adverse reactions.

Use of the newer contrast media has increased rapidly in hospitals in Australia. Data from one teaching hospital showed an increase of 22 per cent in volume of contrast media used between 1986 and 1989, with an associated cost increase of 84 per cent (Hailey, Staples, McLean 1990). Much of the cost increase was due to the changeover to non-ionic contrast media. A recent study of the reduction in mortality associated with a reduced incidence of adverse reactions following substitution of older contrast agents by newer agents suggested that, on present evidence, optimal use of the older contrast media and selective use of the newer agents is probably the most cost effective intervention (Henry, Evans, Robertson 1991).

The evolution of technologies brings new applications which tend to increase their use. A relatively new application of ultrasound is in the determination of blood flow (Doppler ultrasound). This type of diagnostic test represented about 6 per cent of all ultrasound tests for which Medicare benefits were paid in 1990–91. Developments in ultrasound technology have made equipment more portable and versatile. The relatively low cost of ultrasound imaging has made it one of the most used imaging modalities. It now appears to be more frequently used in general practice. Medicare data show that the annual increase for use of this technology in general practice has been about 10 per cent, increasing from 60,090 services in 1984–85 to 98,822 services in 1990–91.

There has been a small increase in the use of pathology testing services in doctors' offices, largely reflecting the development of instrumentation and kits for use in a non-laboratory setting. Pathology services of this sort are not eligible for reimbursement through Medicare unless they are performed by medical practitioners who have obtained pathology laboratory accreditation. The accreditation provisions include an educational component and checks that operator training is appropriate. The proportion of pathology services undertaken in general practice remains low, with the vast majority of tests being performed in laboratories.

The use of health care technologies for rare conditions; the diffusion of technologies

Health care of an increasingly specialised and intensive nature, often involving new technologies, has led to improvements in outcomes for groups of patients with relatively uncommon conditions. Examples include high frequency ventilator support and extracorporeal membrane oxygenation (ECMO) for neonates, and liver transplantation for children with biliary atresia (a condition affecting the bile duct) and adults with liver diseases. Hospitals are central to developments in new technological and specialist areas and their roles have changed in response to these (Hailey, Staples, McLean 1990), but concerns have been expressed that more routine technologies are being overlooked.

A 1987 survey of the diffusion of 13 technologies into Australian hospitals indicated that larger hospitals, particularly teaching hospitals, are more likely to use advanced technologies and use them earlier than small hospitals (Richardson et al. 1992). For some technologies, such as percutaneous renal stone removal, intra-ocular lens implantation and CT of the body, there is a greater probability of use in private than in public hospitals. For others, such as coronary artery bypass graft surgery, echocardiography and uro-dynamics, the reverse is the case.

The initiative to adopt new technologies at Australian hospitals, both private and public, usually comes from hospital medical staff. Many factors could influence the adoption of a technology by a hospital, including:

- the need for inpatient care
- the level of capital investment and operating expenditure required
- a perception that the technology will enhance the quality of patient care provided in the specialty area
- the degree of relevant specialisation at the hospital relative to the technology's complexity

- the estimates of income expected
- status and other benefits for the hospital and medical staff
- the expected length of stay required by patients
- any legislative restraints by State or Territory governments.

In addition to the factors mentioned above, the relatively limited diffusion of some technologies can be related to:

- the rarity of conditions likely to need them
- high operating costs
- the rapid rate at which they are developing
- availability of people with skills to use them
- availability of supporting health care services, including emergency back-up
- the marginal cost of adding them at specific facilities.

Some health care technologies do not lend themselves to use by a large proportion of hospitals. Liver transplantation is an example of a technology which is not well suited to extensive diffusion. Only about 100 people per year are likely to be suitable patients, and only three centres currently perform operations. Some aspects of the operation are complex, both technically and organisationally (Australian Health Technology Advisory Committee 1991).

New technologies that have high capital and/or operating costs, or which need staff and support services that are in short supply, can cause considerable strain within hospitals adopting the technology without specific funding. Their introduction can be at the expense of other less innovative technologies and services which remain in demand by many more people.

Geographic distribution factors—realities of access for the rural community

Specialist medical practitioners with expertise in new health care technologies are unevenly distributed between country and city areas. They are mainly based close to inner metropolitan areas or to university teaching hospitals.

For many Australians, advanced technologies and the specialists who use them are not readily accessible since lengthy travel is required. People requiring ongoing hemodialysis outside their home must travel three times a week to a centre which may be a considerable distance away. Referrals from general practitioners to specialists based at inner city locations often involve long trips for people living in country and outer metropolitan areas. For more specialised technologies, the problems of accessibility are greater. For example, patients from Perth requiring liver transplantation must travel to one of the eastern States for this procedure.

The inconvenience and expense to patients of accessing a comprehensive range of technologies and specialists is unlikely to change in the short term. The siting of some health care technologies must remain restricted to large population centres, for reasons given in the previous section—notably costs and limitations in demand, expertise and support services.

On the other hand, there is concern that some highly effective technologies which do not involve high capital costs, such as intra-ocular lens insertion, may not be available to patients in some country areas to the extent they should be (see 'Variations in rates of surgery', page 143). There is a need for further studies to identify any barriers preventing access to effective health technologies, and also to examine ways to overcome them. Barriers to access may include:

- patient ignorance of the availability of services
- reluctance by medical practitioners to refer country patients to cities
- reluctance of specialists to work in country areas
- expenses involved in patient and companion travel (though schemes may be available to assist in many instances)
- the difficulties of travel for some groups of patients (such as older people and people with handicaps)

Sometimes, the rarity of particular conditions in combination with the minimum caseload considerations can, in themselves, limit the number of centres available in Australia to provide ongoing, high quality care. For example, ECMO (extracorporeal membrane oxygenation) is a technique used for treating neonates and some older children with severe respiratory problems. With an estimated annual national caseload of less than 100, and the technology still evolving, it was accepted that, in order to maintain expertise and achieve efficiencies of scale, not more than two centres were required to provide ECMO (Hailey, Slatyer 1992).

Nationally Funded Centres

With Australia's relatively small population, and eight separate State and Territory health authorities, the provision of very high cost services with a relatively low demand presents particular problems. While it would be desirable for all Australians to have access to such services, it is not cost-effective to provide them in every State.

A first attempt was made to deal with this problem by establishing national units. In 1984, the first Australian heart transplant unit was established in Sydney as a national unit, with financial assistance from the Commonwealth. In 1985, it was announced that a National Liver Transplant Unit would be established also in Sydney.

In 1989, AHMAC recognised the need for further development of policy on the national provision of high cost services. Following a study by NHMRC and the Department of Community Services and Health, AHMAC approved a new Nationally Funded Centres Program in June 1990. The Program is aimed at ensuring that all Australians who need approved high cost, low demand services have access to them through the Centres. Funding is from a central pool created principally through deductions from the Hospital Funding Grants to the States and Territories.

Subsequently, AHMAC recommended that proposals for Nationally Funded Centres should be assessed by the Australian Health Technology Advisory Committee (AHTAC) against two sets of criteria, the first designed to establish the suitability of the technology and the second the suitability of the site proposed. The suitability of the technology is judged against such factors as its safety and efficacy, the national demand, and the need to concentrate services for cost efficiency and best performance. AHTAC also has the task of reviewing established Nationally Funded Centres to determine whether continuation of this designation is appropriate.

Nationally Funded Centre status has been approved for three liver transplant units (in Sydney, Melbourne and Brisbane), two adult heart/lung transplant units (in Sydney and Melbourne), a pediatric heart/lung transplant unit in Melbourne, two cerebrovascular embolisation units (in Perth and Sydney) and a pancreas transplant service (in Sydney).

The use of less invasive surgical procedures

Minimal access surgery (MAS) is a term being applied to surgery performed through tiny incisions in the body. Five approaches—laparoscopic, arthroscopic, thoracoscopic, endoluminal and perivisceral endoscopic—have been used.

At present, laparoscopic methods are attracting great interest. Developed from principles first used in gynecological surgery, this approach is now being applied to general surgery. Small incisions are made in the abdominal wall and used to insert a laparoscope and instruments into the abdominal cavity. The laparoscope has a video camera attached, allowing the operating team to view the cavity on a monitor. The operation is performed using a number of tools, some of them procedure-specific. The recent upsurge in new laparoscopic procedures has been made possible by advances in video technology and development of new laparoscopic instruments (Hirsch, Hailey 1992).

The major advantages of MAS over conventional surgery are due to the smallness of the incisions and wounds. Post-operative pain is less and recovery faster. For example, the laparoscopic technique applied to cholecystectomy (removal of the gallbladder) has reduced the period a patient spends in hospital from over a week to as little as one or two days (Reddick, Olsen 1989; Hirsch 1990). Patients can also return to normal activities more rapidly—often within a week following the laparoscopic procedure compared with a month or more following open cholecystectomy. Early experience at one Australian centre resulted in an average of 12 days for patients to return to normal activity after laparoscopic cholecystectomy, compared with 43 days for patients who had conventional surgery (St Vincent's Hospital 1992).

Laparoscopic cholecystectomy is the first MAS technique to become popular in general surgery, and its use is diffusing rapidly in all western countries. Since it was first described in 1989, it has been estimated that more than 20,000 laparoscopic cholecystectomies had been performed to November 1990 (American Medical Association 1991). The Canadian Coordinating Office for Health Technology Assessment (1991) found that in May 1991 almost a third of surveyed hospitals already used the procedure, and another third intended to do so. In Australia, over 3,500 laparoscopic cholecystectomies were performed to April 1991 (Wilson 1991). The procedure is predicted to replace at least 80 per cent of open cholecystectomies.

The application of the laparoscopic approach to a procedure as common as cholecystectomy (over 23,000 are performed annually in Australia (National Health Technology Advisory Panel 1988)) offers major potential savings—for the patient, the health care system and the community. However, such a rapid diffusion of a new technology is not without difficulties. This diffusion has occurred in the absence of clinical trials to assess the success rate, complications (morbidity and mortality), long-term effects and cost-effectiveness of the procedure. Appropriate training and experience with the new techniques are essential to minimise complications.

Laparoscopic techniques are now being used for several other procedures. These include operations involving prostate carcinomas, varicoceles, inguinal hernias, acute appendicitis, bowel resection, ulcer surgery, hysterectomies and removal of kidneys (Hirsch, Hailey 1992). Other operations which could potentially benefit from laparoscopic techniques include repair of bladder injuries, ureteral ligation, staging and treatment of abdominal cancers, reflux procedures and complex rectal surgery. It is possible that, 10 years from now, most abdominal surgery will be performed laparoscopically. However, the rate at which individual MAS procedures are introduced remains uncertain and will depend on a number of factors including:

- patient demand
- whether the procedure is usually performed on an elective or an emergency basis
- the expected advantage over existing methods
- availability of suitable equipment and instruments
- reimbursement policy
- institutional barriers within the health care system (Hirsch, Hailey 1992).

The impact of MAS on general surgical practice, health care costs and patient wellbeing promises to be large. There will be a need to ensure that such methods are used wisely, with appropriate patient selection, operator training and competence, and suitably high caseload. For such procedures to achieve maximum benefits and provide cost savings, close consideration will need to be given to the following areas:

- *establishment of efficacy and safety of each procedure before widespread diffusion;*
- *cost-effectiveness in comparison with alternative procedures*—some existing procedures, such as appendicectomy, already offer short hospital stay and early return to normal activities;
- *long-term changes in types of hospital facilities needed*—further adoption of MAS may require restructuring of hospitals to take account of requirements for short-term accommodation and additional theatre capacity;
- *provision of training for surgeons, theatre staff and technicians;*
- *safety and application of non-inpatient surgery*—MAS procedures offered on an non-inpatient basis hold the risk of placing an unreasonable burden on the patient and family;
- *widening of indications*—availability of MAS may extend the availability of a procedure to those who would previously have been considered to be at too great a risk for surgery. However, as some MAS procedures will require conversion to open surgery, such extension to frailer patients needs to be approached with caution. There is also the potential for inappropriate use, with the apparent ease of a procedure leading to its application in situations where benefits are uncertain or unlikely. Spiro (1992) has drawn attention to the use of laparoscopic cholecystectomy in situations where the symptoms were not typical of gall bladder disease, and which persisted after the gall bladder had been removed by the MAS technique; and
- *long-term effects and side-effects of each procedure.*

Information technologies

As health care systems become more complex, there is an increasing need for the application of computer-based information technology to ensure that diverse elements of medical data are used to improve patient care.

Information technology offers the possibility of benefits through the integration of hospital and medical records, reduced numbers of diagnostic tests, improved patient scheduling, greater diagnostic accuracy, more timely medical interventions (such as changes to drug therapy), more comprehensive record keeping, and reduced administrative costs. A natural extension of computerised information systems has been the development of specific medical databases relating to individual patients. For example, as part of managing a large hospital, each new patient is given a unique number, and demographic data are entered into a computer. When associated with diagnostic, drug prescribing and other therapeutic information, and physicians' notes, these data form the basis of a patient's medical record.

The development of data transmission technology has helped in the distribution of medical information. For example, on-line pharmaceutical alert services have been developed whereby a dispensing pharmacist with immediate access to a drug information database can provide patients with a comprehensive list of contraindications. The availability of cheaper, more accessible information technologies, linked to more convenient treatment and monitoring methods, has the potential to provide patients with more autonomy and improved ability to recover or live with chronic illness in their own homes. For the potential to be fully realised, patients will require sufficient functional literacy to cope with the flow of information.

However, the benefits of information technology cannot be achieved without careful planning. For the development of standardised and integrated medical records, national coordination and planning would be desirable. While this has been achieved to some extent in Sweden and the Netherlands, the Australian health care system, which relies on private practitioners and State and Territory agencies to deliver health care, presents complex problems of coordination. Planning and coordination activities have commenced through the formation of the Information Technology Committee for Medical Information of the Australian Standards Organisation. These activities are supplemented by the work of State and Territory bodies (such as the Information Resource Management Centre of New South Wales, which aims to achieve integration of hospital systems at a State level).

A major difficulty has been the lack of common standards between medical equipment suppliers from the United States, Europe and Japan. Partly because of increasing pressure from hospitals and health administrators, there is now a concerted move by major international standards bodies for the adoption of 'open' system standards which would allow medical record data such as specialist reports, medical images and patient records to be readily integrated and transmitted from one department to another, or between hospitals and doctors in the community. Such developments would assist the implementation of systems throughout hospitals.

Concern has been expressed about the confidentiality of patient medical data in such 'open' systems and consideration is being given to the design of appropriate legislative safeguards to protect patient privacy. The legal aspects of medical information technology are only beginning to be addressed. For example, it has not yet been determined under which circumstances a medical specialist has the right to withhold information from a patient, or whether a medical record belongs to the doctor or the patient. Consultation with consumer organisations and patients' rights groups will be necessary to assess community attitudes to these problems before the introduction of legislation can be considered.

There are a number of major technical and social issues to be addressed in the wider introduction of information technology to the management of hospital systems and medical records. Formidable problems of standardisation and community acceptance must be addressed before the concept of integrated hospital and medical records systems can become a reality.

Early warning on new health technologies

Sometimes new health technologies can diffuse rapidly before there has been adequate evaluation of their costs and effectiveness, or before the health care system has had time to prepare for their impact (for example, through establishing training programs). It would be desirable for health care planners, administrators and providers to have early warning when such developments are likely. Health authorities also need to be alerted to the emergence of new technologies which have major cost implications, or which offer advantages over those already in use.

In 1991, the Institute undertook a project for the Commonwealth Department of Health, Housing and Community Services to develop a methodology for an early warning program for new health technologies. The project contributed to the development of a series of briefs for Australian health authorities on new health technologies. To April 1992, seven briefs have been developed—laser corneal sculpting, radio frequency catheter ablation, cervical loop diathermy, new laparoscopic surgical procedures, endovascular coronary stents, holmium lasers in corneal sculpting and cardiomyoplasty. All are new technologies which are likely to have profound effects on their particular areas of application.

The patient's perspective

The complexity of some technologies can make health care bewildering for the patient. Patients need to be adequately informed of the nature, purpose and consequences of use of technologies, which may well have significant effects on their health status and lifestyle. They should, as far as is practicable, participate actively in the decision-making process regarding treatment. This in turn implies the need for appropriate methods of presentation, the ability of patients to assimilate information and the opportunity to make a choice.

Such participation is important for the social and psychological wellbeing of the patient, but may also provide valuable insights for those applying the technology. Impediments to information exchange may include reluctance to share knowledge, lack of training on how to inform lay persons, and difficulties in understanding complex concepts. Information from the patient should be a key component in assessing the effectiveness of technologies and in providing input to statistics and decisions on health care resources and their allocation.

Patients' views on health care technologies may provide a useful source of information on issues such as:

- *changes to quality of life resulting from the provision of health services*—this includes reassurance from screening tests and immunisation, improved functioning from care and cure programs, and anxiety or discomfort due to treatment;
- *fear of the disease or of the recommended diagnosis/treatment regimen in acting as a barrier to access and effective participation*—these are important issues, for example, in maximising attendance at cancer screening programs and in the assessment of new, less invasive techniques;
- *time savings and convenience resulting from shorter hospital stays, less time off work and less travel;* and
- *the importance of self-image and cosmetic considerations*—such as reduction in scarring and use of conservative surgery options.

Evidence is now available to suggest that the way a person views their health is importantly related to subsequent health outcomes. Both objective and subjective measures are important dimensions of health status indicators.

3.8 Pharmaceutical drugs

People have used drugs for thousands of years to treat sickness (and to alter states of consciousness), but only since the late nineteenth century has the manufacture and use of drugs been subjected to scientific methods.

Since the early part of this century, Australian governments have regulated the distribution and use of drugs, medicinal (pharmaceutical) and others. Medicinal drugs include those that are only available from pharmacists on the prescription of a medical practitioner, some non-prescription drugs that can be provided only by pharmacists and a range of over-the-counter (OTC) drugs available from pharmacists and other outlets. Examples of OTC drugs are simple analgesics, antacids and cough mixtures.

In cooperation with the States and Territories, the Commonwealth regulation of medicinal drugs includes both imported drugs and drugs manufactured in Australia. All imported medicinal drugs must be certified by the Australian Drug Evaluation Committee to be safe and efficacious.

Prescription drugs are available in Australia from community or hospital pharmacies. Prescriptions dispensed through community pharmacies may be dispensed under the Commonwealth Government's Pharmaceutical Benefit Scheme (PBS—see Box 3.4) or Repatriation Pharmaceutical Benefit Scheme (RPBS), or as non-subsidised prescriptions.

Although the Commonwealth Government exercises considerable control over the distribution and use of medicinal drugs and expends more than $1 billion annually on the provision of drugs, information about most aspects of pharmaceutical drug use in Australia is poor. Good quality data do not exist for the aggregated use of drugs (such as total expenditure by hospitals or individuals on prescription drugs) or for disaggregated use (such as patterns of drug use by individuals).

The assessment of trends in drug use and expenditure is further confounded by changes in administrative arrangements governing drug distribution and use. Changes to prescription requirements, such as occurred in 1985–86 with the de-listing from the PBS of a range of OTC drugs, need to be accounted for in assessing trends. That change meant also that data on the use of OTC-type drugs became not readily available. Changes in the quantities of drugs allowed to be dispensed in a prescription, such as occurred in 1984–85, caused changes in the number of prescriptions which may or may not reflect changes in the consumption of drugs. Other administrative changes, such as the amalgamation from 1 November 1990 of the pensioner and concessional categories, means that analysis of drug use for these specific beneficiary groups will be very difficult.

Furthermore, as discussed later in this section (see 'Drug expenditure by hospitals', page 163), changes in policies on the provision of drugs to hospital inpatients and non-inpatients can produce substantial changes in the provision of drugs by community pharmacies.

Box 3.4: Pharmaceutical Benefits Scheme

The Pharmaceutical Benefits Scheme (PBS) subsidises the cost of a wide range of drugs and medicinal preparations with the aim of ensuring that individuals are not financially precluded from access to these items.

There are two main classes of beneficiaries under the Scheme:

- ***General beneficiaries**—Since 1 April 1992, general beneficiaries have been able to receive items listed in the PBS schedule at a maximum cost of $15.70 (except for items where a special patient contribution or a brand price premium applies). There are two levels of 'safety net' for general beneficiaries. After the first level threshold of $309.90 has been reached in a calendar year, general beneficiaries (individuals and families) are entitled to a Safety Net Concession Card, under which benefits cost $2.60 each for the next $51.60 expenditure. After this threshold has been reached, they are entitled to a Safety Net Entitlement Card, which enables them to get further benefits free for the remainder of the year.*
- ***Concessional beneficiaries**—This group consists of people who are recipients of various types of benefits from the Department of Social Security or Veterans' Affairs (including holders of a Pensioner Health Benefit Card, Health Benefits Card, Dependent Treatment Entitlement Card, Pharmaceutical Benefits Concession Card or a Health Care Card). Since 1 April 1992, concessional beneficiaries have been able to receive items listed in the PBS schedule at a cost of $2.60 (except for items where a special patient contribution or a brand price premium applies). After the safety net threshold of $135.20 has been reached in a calendar year, concessional beneficiaries are entitled to a Safety Net Entitlement Card, which enables them to get further benefits free for the remainder of the year.*

Prior to 1 December 1991, there had been two classifications of people entitled to benefits in excess of those available to general beneficiaries—pensioners and concessional beneficiaries (for details of these groups, see AIH 1990 or pre-December 1991 versions of the Schedule of Pharmaceutical Benefits*).*

All patient contributions to PBS drug costs have been indexed to rise in line with inflation. Under minimum pricing arrangements, the reimbursement to pharmacists is based on the lowest priced brand of a drug. Manufacturers may set their prices higher than this base price, but all patients who use brands priced higher than it have to pay the difference between the base price and the price of that brand. The extra charges do not count towards the threshold amounts.

Source: Department of Health, Housing and Community Services 1992

Expenditure and costs

In 1990–91, total expenditure on pharmaceutical drugs in Australia was around $3 billion (AIHW unpublished), but precise estimates of some of the various components contributing to this total are not known. The components are:

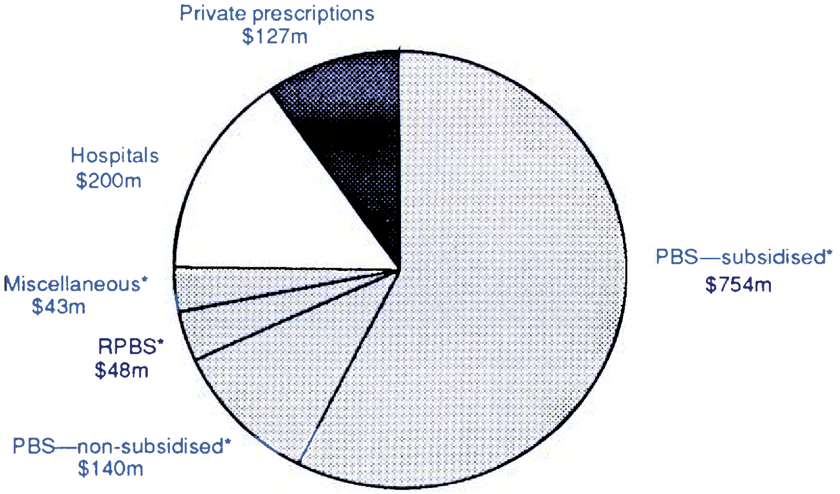
- expenditure by patients and the Commonwealth Government on prescription drugs provided by community pharmacies
- hospital drug use (including the cost of storing and dispensing drugs)
- OTC drugs.

Some data are available for the expenditure by patients and the Commonwealth Government on prescription drugs provided by community pharmacies and for the cost of hospital drugs (but not for the cost of storing and dispensing them). As well, dispensing fees and mark-ups for PBS and RPBS drugs dispensed through community pharmacists are lower than for private prescriptions (prescriptions dispensed for drugs not covered by the PBS or RPBS). Therefore, overall expenditure figures are useful, but a direct comparison gives a misleading picture of the relative importance of drug costs by components.

Costs of pharmaceutical drugs

To overcome these problems, the total costs of pharmaceutical drugs for each component have been compared using manufacturers' prices. In 1990–91, the total cost of drugs for human use was around $1,800 million. Excluding OTC drugs, for which no reliable data are publicly available, the total cost was $1,312 million, comprising $985 million through Commonwealth programs, $127 million for private prescriptions and $200 million for hospital drug use (Figure 3.19). Between 1988 and 1990–91, the proportion of total cost for Commonwealth programs increased from 71 to 75 per cent, while that for hospital drug use declined from 19 to 15 per cent (AIH 1990). Changes in the use of drugs in hospitals are considered on page 163.

Figure 3.19: Total cost at manufacturers' prices of pharmaceutical (excluding OTC) drugs, 1990–91



* Commonwealth programs

Source: Australian Institute of Health and Welfare

Refer to Appendix 1, Table A35

Expenditure on prescription drugs provided by community pharmacies

Between 1980–81 and 1990–91, expenditure on prescription drugs supplied through community pharmacies increased from $534 million to $2,103 million (AIHW unpublished) (Table 3.29). In 1990–91, expenditure by the Commonwealth (through PBS and RPBS) was $1,192 million and that directly by patients was $910 million.

For most of the period, the proportion of total expenditure paid directly by patients was around 35 per cent. However, the proportion increased to 41 per cent in 1988–89 and was more than 43 per cent in 1990–91. The increase in the late 1980s was due partly to the effect of safety net arrangements (see Box 3.4) and partly to increases in patient contributions and prescription prices (Table 3.30). Between 1980–81 and 1990–91, the real price per prescription increased by 34 per cent. Over that period, average expenditure per person on prescription drugs increased by almost 240 per cent, about twice the increase in the consumer price index. Although the average number of prescriptions per person increased by 16 per cent, the increased use of drugs had much less influence on expenditure than did the price of prescription drugs, particularly in the late 1980s. Much of the increase in prices was due to the switch to newer more costly drugs.

Table 3.29: Commonwealth and patient expenditure on pharmaceutical drugs, 1980–81 to 1990–91

	Commonwealth expenditure		*Payments by patients*				
Year	*RPBS*	*PBS*	*PBS: Patient contributions*	*PBS: Other payments*[a]	*Private*	*Total expenditure*	*Patient proportion*
	($'000)	*($'000)*	*($'000)*	*($'000)*	*($'000)*	*($'000)*	*(Per cent)*
1980–81	44,921	298,947	129,923		60,498	534,289	35.6
1981–82	54,851	379,442	157,958		68,287	660,538	34.3
1982–83	61,030	415,582	176,500		83,161	736,273	35.3
1983–84	66,087	471,735	186,018		96,613	820,453	34.4
1984–85	77,090	541,920	221,350		106,425	946,785	34.6
1985–86	86,508	596,565	243,001		132,831	1,058,905	35.5
1986–87	94,829	714,545	189,178		202,421	1,200,973	32.6
1987–88	85,726	910,852	136,778	213,011	180,401	1,526,768	34.7
1988–89	80,879	990,340	168,307	355,315	219,393	1,814,234	41.0
1989–90	83,684	1,135,550	184,762	331,660	250,674	1,986,330	38.6
1990–91	86,044	1,106,719	223,793	436,248	249,785	2,102,589	43.3

(a) For general beneficiaries, PBS drugs priced at less than the patient contribution attract no PBS subsidy. General beneficiaries pay the full cost of the drugs and no details of their numbers or cost are collected by HHCS. These amounts are estimated from information collected by the Pharmacy Guild of Australia, and made available to the Drug Utilisation Subcommittee of the Pharmaceutical Benefits Advisory Committee.

Sources: Australian Institute of Health and Welfare
Department of Health, Housing and Community Services (unpublished)

Table 3.30: Estimated number of prescriptions and expenditure on prescriptions, 1980–81 to 1990–91

Year	*Number of prescriptions*	*Prescriptions per capita*	*Expenditure per capita*	*Cost per prescription*	*Indexed price per prescription*[(a)]
	('000)	*(Number)*	*($)*	*($)*	
1980–81	115,289	**7.73**	35.80	4.63	100
1981–82	124,998	**8.23**	43.50	5.28	100
1982–83	127,699	**8.30**	47.83	5.77	98
1983–84	132,093	**8.48**	52.66	6.21	101
1984–85	145,352	**9.21**	59.97	6.51	100
1985–86	146,800	9.16	66.11	7.21	102
1986–87	135,954	8.36	73.85	8.83	114
1987–88	145,789	8.82	92.32	10.47	126
1988–89	160,035	9.53	108.08	11.34	127
1989–90	162,486	9.54	116.58	12.22	127
1990–91	155,223	8.98	120.87	13.55	134

(a) Real prices indexed to the 1980–81 price using Consumer Price Index.

Sources: Australian Institute of Health and Welfare
Department of Health, Housing and Community Services (unpublished)

Trends in use of prescription drugs provided by community pharmacies

As with other analyses of the use of pharmaceutical drugs, an examination of the trends in use of prescription drugs is limited by the poor quality of data. As well, such an examination is complicated by frequent policy changes affecting the Pharmaceutical Benefits Scheme.

However, since July 1989 the Pharmacy Guild of Australia and the Drug Utilisation Subcommittee (DUSC) of the Pharmaceutical Benefits Advisory Committee have collaborated in the collection of information on the numbers and types of prescriptions dispensed by a random sample of community pharmacies. This collection gives reliable estimates of the number of private prescriptions provided through community pharmacies, and allows the number that count towards the safety net arrangements to be accurately measured. As well, DUSC is now able to examine the types of drugs dispensed as private prescriptions, but no information is available on individual drug users. This collection provides very reliable estimates of PBS and RPBS drugs dispensed, and is likely also to provide accurate information on the other categories of prescription use.

Combining information from this collection with data available from earlier surveys conducted by the Pharmacy Guild, the Institute has estimated the total number of prescriptions dispensed through community pharmacies since 1980–81.

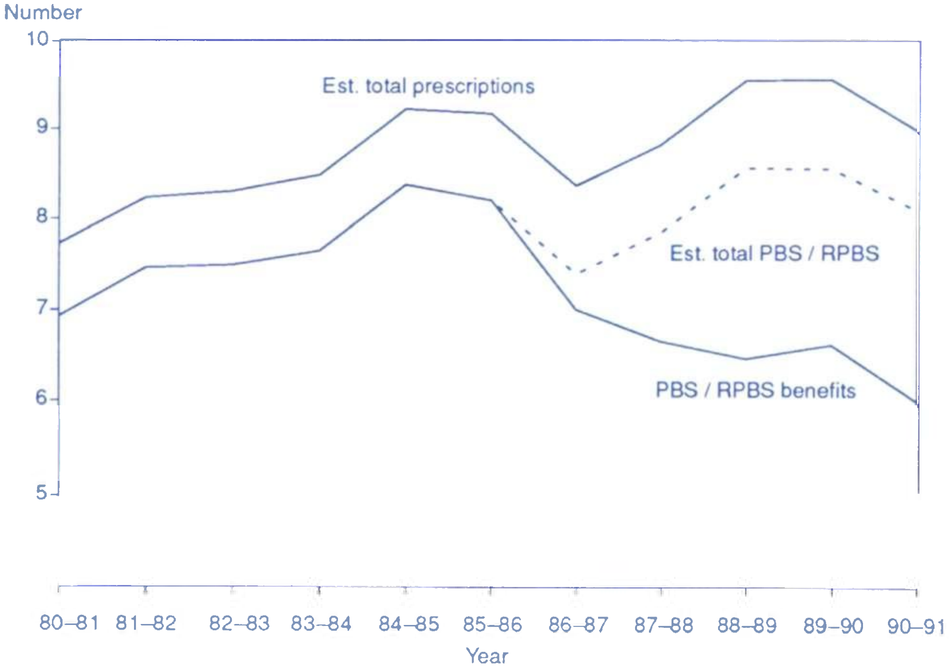
The estimated total number of prescriptions used per person (for PBS/RPBS and non-PBS/RPBS drugs) increased from 7.7 in 1980–81 to 9.0 in 1990–91 (Figure 3.20). The number of PBS and RPBS prescriptions per person for which the Commonwealth paid benefits increased from 6.9 in 1980–81 to 8.4 in 1984–85. From 1984–85, the number of Commonwealth-subsidised prescriptions per person declined fairly steadily to 6.0 in 1990–91. This decline reflects changes in the subsidy provisions of the PBS and RPBS. From 1985–86, the estimated total number of PBS and RPBS prescriptions (including those not subsidised by the Commonwealth) declined initially but increased to 8.6 prescriptions per person in 1988–89 and 1989–90, and then dropped slightly to 8.1 in 1990–91 (the estimates for 1989–90 and 1990–91, based on the Guild/DUSC collection, are more reliable than those for the earlier years).

Between 1980–81 and 1990–91, the proportion of non-PBS/RPBS prescriptions has been remarkably stable, ranging between 9 and 11 per cent of all prescriptions.

As noted earlier, policy changes affecting the PBS have contributed to some of the changes in prescription use per person. The first major change in this period was the introduction in January 1983 of the Concessional Beneficiary scheme, which enabled certain Social Security beneficiaries to receive PBS drugs at $2 per prescription instead of the then standard $4. This change did not, however, appear to produce any increase in use of drugs. The increase in 1984–85 in the quantities allowed to be supplied per prescription of drugs for chronic conditions may have caused the small decline that occurred between 1984–85 and 1985–86 in the number of PBS/RPBS prescriptions.

The introduction in November 1986 of safety net arrangements for general and concessional beneficiaries was largely responsible for the decline in the number of Commonwealth-subsidised prescriptions per person that occurred after 1985–86. Also contributing to the decline was the de-listing from the PBS of a range of OTC drugs. The de-listing of these drugs also meant that prescriptions were no longer required for their use. As a result, information about their use is no longer available through routine data systems.

Figure 3.20: Prescription use per capita, 1980–81 to 1990–91



Source: Australian Institute of Health and Welfare

Refer to Appendix 1, Table A36

The sharp decline in prescription use per person that occurred between 1989–90 and 1990–91 appears to have been caused by the introduction in November 1990 of patient contribution and safety net arrangements for pensioners.

Between 1980–81 and 1989–90, the prescription use per pensioner beneficiary (see Box 3.4, page 158) increased from 23.0 to 28.6. It is not possible to provide an estimate for 1990–91, as the HIC payment system does not distinguish between concessional and pensioner beneficiaries once the safety net threshold is reached. On the basis that the use of private prescriptions is likely to be much less by pensioners than by non-pensioners, the use by non-pensioners was estimated assuming that pensioner beneficiaries do not use any private prescriptions.

Under this assumption, average prescription use by non–pensioners increased from 5.3 to 6.4 between 1980–81 and 1989–90. This assumption probably over–estimates the average prescription use by non–pensioners in both periods, but should not bias the estimate of the rate of growth of prescription use. From these estimates, and based on trends in estimates for this period, the prescription use per person increased by 2.3 per cent per year for pensioners and by 1.4 per cent per year for non-pensioners.The difference between pensioners and non–pensioners in rates of growth in prescription use could be due to the introduction in 1986 of safety net arrangements for non-pensioners. The 1990 introduction of similar arrangements for pensioners may result in more even rates of growth for the two groups in future.

Drug expenditure by hospitals

As part of three Hospital Utilisation and Costs Studies conducted by the Institute for the years 1985–86, 1987–88 and 1989–90, information was collected about expenditure by public and repatriation hospitals on prescription and OTC-type drugs. Most government hospital drug supplies in Australia are purchased through some form of central authority, although some hospitals have their own tendering arrangements. Information about hospital expenditure on drugs does not include the costs of inventory, storage and dispensing. As a result, the figures on hospital expenditure cannot be compared directly with expenditure by individuals for drugs purchased through community pharmacies.

Between 1985–86 and 1987–88, expenditure on drugs by public and repatriation hospitals increased by 22 per cent, but it then decreased by 12 per cent between 1987–88 and 1989–90 (Table 3.31). In the latter period, expenditure by public hospitals decreased by more than 14 per cent, while that by repatriation hospitals increased by almost 27 per cent.

Even though there are differences in the range of drugs provided by community pharmacies and hospitals, some idea of the movement in the cost of drugs can be gauged from changes in the average cost of prescription drugs provided by community pharmacies. The average cost of these drugs increased by about 30 per cent between 1985–86 and 1987–88, and by 22 per cent in the following two years.

Table 3.31: Expenditure by public and repatriation hospitals on drugs, 1985–86 to 1989–90

($ million)

Hospital type	*1985–86*	*1987–88*	*1989–90*
Public	180.3	222.6	190.9
Repatriation	11.4	11.5	14.6
All hospitals	**191.7**	**234.1**	**205.5**

Source: Department of Health, Housing and Community Services (unpublished)

During the late 1980s, there were moves by most public hospitals to reduce the supply of drugs provided to non-inpatients and to inpatients on their discharge from hospital. This effectively transferred costs from the hospitals to patients and the Commonwealth Government (through subsidies provided by PBS).

If overall and public hospital drug use remained constant between 1987–88 and 1989–90, under the unlikely assumption that prices also remained constant, costs of about $32 million were transferred out of hospitals in that period. This could represent about 4 to 5 million prescriptions. If, as appears more likely, the cost of hospital drugs increased by about 22 per cent (the level of increase in the cost of drugs provided by community pharmacies), costs of about $80 million were transferred out of hospitals, representing between 10 and 13 million prescriptions.

Between 1987–88 and 1989–90, it is estimated that the number of prescriptions dispensed through community pharmacies increased from 146 to 162 million (see Table 3.30). It is likely that the changes in drug dispensing by hospitals could have accounted for between 4 and 13 million of this estimated increase of 16 million prescriptions. This is consistent with the changes in the proportions of total drug costs borne by hospitals and Commonwealth programs (see 'Costs of pharmaceutical drugs', page 159). While the proportion borne by the hospitals declined by 4.2 per cent, that borne by Commonwealth programs increased by 4.3 per cent.

3.9 Health promotion and disease prevention

The introduction to a major essay on health promotion noted that 'the history of civilizations could be written as a history of people transferring knowledge, first on how to survive, then on how to live with less discomfort, and finally on how to fulfill their aspirations' (Green 1986: 1089). The essay points out that these three aspects remain important in health promotion and disease prevention, although, in developed countries at least, greater emphasis is now directed to human performance, productivity and self-expression, physical fitness and mental efficiency. At one level, many activities of human societies, including all those in the health sector, could be viewed as health promotion and disease prevention. In practice, however, most health promotion activities have focused on strategies aimed at changing individual behaviour (such as individual counselling or social marketing programs directed at smoking cessation). Disease prevention typically includes immunisation and screening programs.

In the 1970s, people came to realise that health promotion strategies aiming at individual behaviour change were not enough, and that attention needed to be directed also at people's physical, social and economic environment. This is reflected in the definition of health promotion adopted as part of the Ottawa Charter of the First International Conference on Health Promotion, held in November 1986:

> Health promotion is the process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical, mental and social wellbeing an individual or group must be able to identify and realise aspirations, to satisfy needs and to change or cope with the environment. Health is, therefore, seen as a resource for everyday life, not the objective of living. Health is a positive concept emphasising social and personal resources, as well as physical capacities. Therefore, health promotion is not just the responsibility of the health sector, but goes beyond health lifestyles to wellbeing (World Health Organization 1986).

The context of recent international health promotion initiatives

The Ottawa Charter's broad-ranging definition of health promotion captures the spirit of what has been termed the 'veritable renaissance' of national health promotion and disease prevention initiatives that emerged during the 1970s (McBeath 1991:1561), and which were triggered initially by the report entitled *A new perspective on the health of Canadians* (Lalonde 1974). In introducing the 'health field concept' (in which health outcomes are viewed as an interaction of human biology, environment, lifestyle and health care—see Section 1.4, page 16), this report captured the growing awareness that health promotion needed to look beyond individual behaviour and recognise the importance of aspects of the social, physical and economic environment. As such, it foreshadowed the emphasis given by WHO to intersectoral action for health.

This movement eventually resulted in the 1986 Ottawa Charter, which identified five health promotion action areas:

- *building healthy public policy*—to advocate a clear political commitment to health and equity in all sectors
- *creating supportive environments*—to counteract the pressures towards harmful products, resource depletion and unhealthy living conditions
- *strengthening community action*—to ensure community participation in setting priorities, making decisions and planning strategies
- *developing personal skills*—to increase options available to exercise more control over their own health and over their environments and to make choices conducive to health
- *re-orienting health services*—requires stronger attention towards the promotion of health to health research and changes in professional education and training.

In developing these themes, the Second International Conference on Health Promotion, held in Adelaide in April 1988, stressed the need for equity and accountability and Health for All leadership, and focused on action outside the health service sector in shaping healthy public policy.

In parallel with the recognition in the 1970s that health promotion approaches needed to be broadened, in 1977 the World Health Assembly directed attention to societal-level health promotion:

> ...the main social target of governments and the WHO in the coming decades should be the attainment by all citizens of the world by the year 2000 of a level of health that will permit them to lead a socially and productive life (WHO 1981:15).

WHO's global strategy, endorsed by member nations in 1981, includes 12 indicators to be monitored and evaluated on a regular basis.

Preceding this endorsement, some countries had already started to develop goals and objectives (including time-limited targets) for their health systems. The most comprehensive of these were the 226 specific and quantifiable objectives set for attainment in the United States by 1990 (US Public Health Service 1980). Unlike most other countries, the US set in train mechanisms for achieving these objectives and for monitoring progress towards them, and, in the late 1980s, moved to update and expand them. Through 'an arduous, multistage, deliberative process that included 22 expert working groups, regional and national hearings, and review and comment by a consortium of 300 national organizations ... several federal agencies, and all state departments' (McBeath 1991:1562), the US has since set 298 objectives in 22 priority areas for attainment by their health system by the year 2000 (US Department of Health and Human Services, Public Health Service 1991).

Health promotion and disease prevention initiatives in Australia

Responding to the growing international interest, in 1978 the Commonwealth Minister for Health commissioned a study of the potential of health promotion, primary prevention, health education and self-care. As well as summarising worthwhile health promotion approaches, the report identified three basic requirements for a successful national program: a political commitment by both Commonwealth and State governments, a national health promotion policy based on agreed priorities, and an operational strategy for the development of suitable infrastructure (Commonwealth Department of Health 1979).

In the early 1980s, considerable progress was made on health promotion activities in a number of States and Territories, but little happened nationally until the establishment in 1985 of the Better Health Commission (BHC). The BHC was given the tasks of examining the health status of Australians, and recommending national health goals, priorities and programs to achieve significant improvements in illness prevention and health awareness. The Commission's report (1986), *Looking forward to better health*, provided a useful summary of the prospects for health promotion in Australia and recommended a number of initiatives. While it is likely that the Commission's work stimulated developments at State and Territory level, the most tangible national result of its work was the establishment in 1987 of another committee, the AHMAC Health Targets and Implementation (Health For All) Committee (HTIC).

As its name implies, the HTIC's tasks were more oriented to health goals:

- determine areas in which goals are to be set;
- define specific and measurable health targets which Australia can aim to achieve within a stated period;
- propose preventive strategies to achieve these targets; and
- determine a process for the monitoring, review and evaluation of national health goals and strategies.

The Committee's report, *Health for all Australians*, recognised that Australia 'lacked nationally agreed health policies, goals and targets' and that there were no effective means of promoting health nationally (HTIC 1988:8). WHO's Health for All strategy was seen as providing 'important organising principles against which policy decisions about particular health problems can be considered and it could also represent a set of standards against which progress over the next decade might be assessed' (HTIC 1988:8).

The Committee's recognition that 'the prevention and reduction of illness, the promotion of health and the reduction of health inequalities need to become key themes and priorities *across all health systems*' (HTIC 1988:11, emphasis added) was reflected in its wide-ranging recommendations, of which only selected aspects were acted upon, and then only partially. The major actions flowing from the HTIC recommendations were the establishment of a National Better Health Program (NBHP) (a cost-shared program in which Commonwealth funding is matched by participating States and Territories on a dollar-for-dollar basis) and some further development of health goals and targets. Key recommendations relating to 'all health systems' do not appear to have been acted upon, with the consequence that the reorientation of the health system, central to the Health for All approach, was not addressed.

An important Australian initiative in health promotion has been the establishment since 1987 of bodies like the Victorian Health Promotion Foundation, which supports health promotion and disease prevention activities using funds raised from a levy on tobacco products. In 1990–91, the Victorian Health Promotion Foundation provided a total of $31.5 million in grants and sponsorships to health services and research agencies, sporting bodies and arts organisations (Victorian Health Promotion Foundation 1991). The success of this approach to health promotion and disease prevention can be gauged from the establishment of similar bodies in other Australian States and overseas.

National Better Health Program

At the outset, it is necessary to place the NBHP within the overall context of health promotion and disease prevention activities, which are exceedingly diverse, involving many elements of the health and non-health sectors. For example, legislative and fiscal mechanisms (such as the regulation of tobacco advertising or the taxing of alcoholic beverages) play important roles. Specific health promotion activities occur through the mass media and in a variety of settings—worksites, health care contacts (including primary care settings), community activities, and in schools (Green 1986).

In Australia, specific health promotion and disease prevention programs are largely the responsibility of State and Territory health authorities, but there are a few national programs, such as National Campaign Against Drug Abuse (NCADA) and those directed to HIV/AIDS.

Within the health sector, expenditure on health promotion and disease prevention activities in 1988–89 (the last year for which complete data are available) was at least $280 million, or about 1.7 per cent of total recurrent health expenditure by governments. State and Territory governments expended $213 million and the Commonwealth $67 million. The extent to which these figures underestimate the true expenditure is not known, as they do not include, for example, health promotion as a part of medical or dental consultations or that provided by community health services. The States and Territories also appear to differ in the way they classify health promotion and disease prevention activities.

With total funding for four years (until July 1992) of $39 million, the NBHP is thus a very small component of the health promotion and disease prevention scene in Australia. Estimated Commonwealth expenditure of $8.2 million in 1990–91 is small, even compared with other national initiatives such as NCADA and the HIV/AIDS programs. Despite its small size, however, the NBHP has been seen as an important development towards national approaches in health promotion and disease prevention.

In addressing its long-term goal 'to contribute to improvements in the health status of all Australians and to the reduction of inequities in health status between social groups, through the promotion of better health and the reduction of preventable illness, injury and premature death', the NBHP (1989) established seven objectives:

1. To develop, promote, implement, monitor and evaluate a national health promotion program, concentrating on five priority areas—hypertension, nutrition, injury prevention, preventable cancers, and the health of older people.
2. To achieve substantial impact and improved health status outcomes throughout the life of the program and in the longer term.
3. To provide a national strategic guide for action for other organisations.
4. To encourage structural changes which support the promotion of health and prevention of ill health in both health and non-health sectors.
5. To promote understanding of the 'Health for All' philosophy and approach.

6. To encourage and support the incorporation of health promotion and illness prevention strategies in government (at all levels); and community and private sector policies and programs.
7. To demonstrate the benefits of a coordinated national approach to address major health issues.

To date, a total of 200 Commonwealth and State or Territory projects have been funded under the NBHP. Projects have been funded in the five priority areas and in the area of structural support and change. Thirty per cent of the pooled resources have been devoted to national projects or strategies, with the remaining 70 per cent being allocated to projects at the State or Territory level.

In 1991, the Commonwealth Minister established an independent panel to review progress on the NBHP. The Panel's final report is expected to be completed by June 1992, but the general findings were presented in an interim report to AHMAC in March 1992. In its interim report, the Ministerial Panel (1992) summarised achievements of the NBHP, but concluded there was a need for:

- clearer strategic direction and coordination at the national level;
- incorporation of health promotion activities and directions within the health sector as a whole;
- greater understanding and acceptance of health promotion among health professionals and relevant interest groups;
- clarification of the role of a national health promotion program; and
- strengthening links with other health promotion initiatives.

The Panel also drew attention to the confusion between 'the concepts of a national Health for All strategy and a more modest health promotion program' (Ministerial Panel 1992: np). It recommended that national health goals and targets, as agreed by Commonwealth, State and Territory Health Ministers, should provide the basis for planning and evaluation of programs and services for the whole health sector, including the need for intersectoral collaboration.

The Panel also recommended that development of national health promotion activities should be 'within the framework and process established by the national health goals and targets' (Ministerial Panel 1992: np). It recognised the value of nationally coordinated strategies in health promotion and disease prevention in priority areas where issues and structural barriers transcend State and Territory boundaries, and noted the need for national leadership in goal-setting, coordination, monitoring and evaluation, and support for national demonstration projects.

The adoption of the joint approach recommended by the Panel would represent a major breakthrough for health promotion and disease prevention in Australia, particularly at the societal level and possibly in terms of specific health promotion and disease prevention.

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4 Health differentials

Australia has one of the healthiest populations in the world in terms of indicators such as life expectancy and infant mortality (see Chapter 2). There are, however, substantial disparities in the health status of different population sub-groups (see for example, Lee et al. 1987; Health Targets and Implementation Committee 1988; McClelland 1991a).

This chapter presents evidence of differentials in health status and risk factors between various sub-groups in the Australian population. Section 4.1 summarises differentials in mortality, disability, recent and serious chronic illnesses, and reduced activity (as a result of illness or injury) for population sub-groups characterised by age, sex, socioeconomic status, marital status, country of origin and place of residence. The main data sources used in Section 4.1 do not identify Australian Aborigines and Torres Strait Islanders with sufficient completeness to permit the same type of analysis to be undertaken for them, but differentials in mortality and hospitalisation between Australian Aborigines and Torres Strait Islanders and other Australians are summarised in Section 4.2. Evidence of differentials in dental health status by age, education and occupation, and, for children, by Aboriginality is presented in Section 4.3.

Differentials in the levels of various risk factors are considered in Section 4.4. As well as analysing differentials by similar characteristics to those used in Section 4.1, Section 4.4 summarises differentials in coronary heart disease risk factors between the eight Australian capital cities, and compares these levels with those in a number of overseas locations.

4.1 Differentials in health status

This section summarises the evidence for differentials in health status between various sub-groups in the Australian population, as outlined above. The main analysis focuses on four broad age groups: children (0 to 14 years of age), young adults (15 to 24 years of age), 'working age' adults (25 to 64 years) and older people (aged 65 years or more). Health differentials in the Australian population are documented for a range of indicators summarising mortality, disability and illness experience (see Box 4.1 for details of indicators and data sources).

As noted in Chapter 2, death and illness rates rise with age, so the age distribution of population groups greatly influences their crude rates for these measures of health. All health indicators have been age-standardised to the total Australian population in 1988, which eliminates the effects of the age distributions of the population sub-groups from the differentials presented. However, the differentials have not been adjusted for the effects of any other differences in the groups. For example, it may well be that some parts of the health differentials between urban and rural Australians are related to differences in socioeconomic status, and to the proportion

Box 4.1: Indicators used in assessing health status differentials

Death rate: *Number of deaths per 100,000 population. These rates were calculated from death registration data supplied by ABS for deaths registered in the calendar years 1985, 1986 and 1987. Denominators for the calculation of rates were derived from ABS estimated resident population data for 1985, 1986 and 1987 (ABS 3201.0, 3220.0, 3221.0) and from tabulations published by ABS for the 1986 population census. Death rates for major causes of death were calculated using the major groups defined in the International Classification of Diseases (WHO 1977). Selected causes of death were defined in terms of ICD-9 codes at the three digit level.*

Disability rate: *Prevalence of disability (per cent of population). These rates were calculated using data from the 1988 Survey of Ageing and Disability (ABS 1990a). A disabled person is defined as a person who has one or more of a group of selected impairments and disabilities (such as loss of sight or hearing, incomplete use of arms or legs, slowness at learning or understanding etc.) which have lasted, or are likely to last, for six months or more (See Section 2.4).*

Serious chronic illness: *The average number of serious chronic (long-term) illness conditions per person in the Australian population, estimated from the numbers of illness conditions which had lasted at least six months, or which the respondent expected to last for six months or more, reported in the ABS 1989–90 National Health Survey (1989–90 NHS). Illness conditions defined as serious are listed in Box 4.2.*

Recent illness: *The average number of serious or intermediate illness conditions per person experienced in a two week period in the Australian population, estimated from reported illness conditions experienced in the two weeks prior to interview in the 1989–90 NHS. Minor illnesses (as defined in Box 4.2) were excluded from this average.*

Reduced activity: *The average number of days of reduced activity per year due to illness or injury. This was estimated for persons aged one year or more by multiplying by 26 the average reported days of reduced activity in the two weeks prior to interview in the 1989–90 NHS. Reduced activity includes any day which the respondent spent in hospital, stayed home from work or school or otherwise cut down on his or her usual activities for all or most of the day.*

Rates for all health indicators were age-standardised to the total Australian population at 30 June 1988.

of migrants in each group. Similarly, the differentials found in mortality between occupation groups may be influenced by the presence of higher proportions of recent migrants (with lower mortality rates than Australian-born people) in some occupation groups. As a result, the results presented may not be precise estimates of the true differentials in occupation-related mortality.

Most differentials are presented as relative to the population sub-group with the lowest overall age-standardised rate. Thus, sex differentials in death rates are given in terms of the ratio of the male rate to the female rate. A ratio of 1.0 indicates that there is no difference between the rates of the two groups and a ratio of 1.5 indicates that the second group has a 50 per cent higher rate than the reference group. Rate ratios are presented graphically using a logarithmic scale—the vertical axis represents a rate ratio of 1.0, and rate ratios of 0.5 and 2 are represented by equal length bars extending outwards from the vertical axis in opposite directions. State and Territory differentials are presented as relative to the rates for Australia as a whole, and differentials by country of birth are presented as relative to Australian rates.

Box 4.2: Classification of recent illness

Illness conditions reported by respondents in the ABS 1989–90 National Health Survey were categorised into one of three groups—minor, intermediate and serious—largely based on a classification system developed by the Royal College of General Practitioners in the United Kingdom (McCormick, Rosenbaum 1990).

ICD–9 Chapter	Minor	Intermediate	Serious
Infectious and parasitic	Virus unspecified Infection unspecified	Herpes Tinea Other(a)	
Neoplasms			All
Endocrine, nutritional	Obesity	High blood sugar High cholesterol Fluid problems Other	Thyroid disease Gout Diabetes mellitus
Blood diseases		All(a)	
Mental disorders	Nerves, tension, emotional problems	Depression Other(a)	Psychoses Mental retardation
Nervous system	Disorders of refraction and accomodation	Blindness (complete or partial *not* corrected by glasses) Other eye diseases(a) Otitis media Deafness (complete or partial) Ear pain Other ear diseases Migraine	Epilepsy Paralysis Other
Circulatory system	Ill-defined signs and symptoms of heart disease	Hypertension Varicose veins Hemorrhoids	Atherosclerosis Heart disease Cerebrovascular disease Stroke after-effects Other
Respiratory system	Common cold Influenza Sinusitis Cough/sore throat	Hay fever Other(a)	Bronchitis, emphysema Asthma
Digestive system	Constipation	Diarrhea, colitis, enteritis(a) Dental problems Other(a)	Ulcer Hernia
Genitourinary system	Menstrual disorders	Other urinary tract Other genital(a)	Kidney diseases
Complications of pregnancy	(b)	Complications	
Skin diseases	Skin rash unspecified	Eczema, dermatitis(a) Acne Other(a)	
Musculoskeletal		Arthritis Sciatica Back trouble Absence of limbs or parts of limbs(a) Musculoskeletal deformities(a) Other(a)	Rheumatism
Congenital anomalies			All

Continued next page

Box 4.2: Classification of recent illness (continued)

ICD–9 Chapter	Minor	Intermediate	Serious
Ill-defined conditions	Allergy unspecified Insomnia Pyrexia Localised swelling Difficulty breathing Chest pain Abdominal pain Heartburn Dizziness Hangover Headache (excluding migraine) Other		
Injury and poisoning		Injuries[a] Complications of surgical and medical care	

(a) Recent illness classified as intermediate only if it resulted in one or more days of reduced activity in last two weeks, otherwise classified as minor.

(b) Normal pregnancy and normal childbirth were not classified as illness conditions.

Standard errors were calculated for all age-standardised rates. For rates derived from population surveys, these take into account the statistical uncertainty resulting from the fact that only a sample of the total population was included in the survey. Statistical significance tests do not take into account non-sampling errors, such as those which may arise from reporting biases or misclassification. Statistically significant differentials (at the $p<0.01$ level) are indicated by an asterisk in the Tables. In the text, these differences are described generally as 'significant'.

For a detailed description of methodology and comprehensive tabulations of differentials, see Mathers (in press). These results are also discussed in detail by the National Health Strategy (1992), along with reviews of previous Australian studies and overseas data relating to health differentials.

Differentials by age

For most of the results presented, the effect of age differences on health indicators has been eliminated by standardisation, or by examining differentials for broad age groups.

However, age is itself a very important determinant of differences in health (Table 4.1). For example, death rates for the 55 to 64 year age group are over ten times greater than those for the 25 to 34 year age group, a larger differential than any of those between the sociodemographic sub-groups. Similarly, the prevalence of disability and serious chronic illness increases steeply at older ages and is close to 100 per cent at ages 95 years and over. The average number of recent illness conditions increases more slowly with age, with around two- to three-fold increases between 25 to 34 years and 65 to 74 years. In general, the more serious the outcome being measured by the health indicator, the steeper is the gradient with age.

Table 4.1: Health status indicators[a] by age and sex, late 1980s

Age group (years)	Death rate	Disability rate	Serious chronic illness	Recent illness	Reduced activity
	(Per 100,000 population)	(Per cent)	(Number per person)	(Number per person)	(Days per person per year)
Males					
0–4	252	4.0	0.13	0.31	9.5
5–14	27	8.5	0.24	0.32	16.0
15–24	130	6.5	0.15	0.29	16.8
25–34	130	8.6	0.14	0.33	16.3
35–44	179	12.2	0.19	0.41	16.8
45–54	488	17.6	0.26	0.60	21.4
55–64	1,436	36.1	0.47	1.05	34.0
65–74	3,641	48.8	0.70	1.43	34.3
75 and over	10,286	60.8	0.68	1.45	42.4
All ages[b]	**7,777**	**16.0**	**0.26**	**0.53**	**20.1**
Females					
0–4	193	2.7	0.10	0.27	9.0
5–14	17	6.3	0.16	0.30	16.6
15–24	47	5.8	0.18	0.40	19.0
25–34	53	7.4	0.17	0.45	24.0
35–44	102	11.5	0.20	0.52	21.2
45–54	287	17.1	0.28	0.82	29.1
55–64	731	25.0	0.38	1.21	32.0
65–74	1,938	40.4	0.51	1.54	37.9
75 and over	7,784	65.1	0.57	1.69	48.8
All ages[b]	**6,581**	**15.2**	**0.24**	**0.65**	**24.1**

(a) See Box 4.1 for definitions.

(b) Crude rates.

Source: Australian Institute of Health and Welfare, derived from 1985–1987 mortality data, ABS 1988 Survey of Disability and Ageing, ABS 1989–90 National Health Survey

Differentials between males and females

Females have a longer life expectancy at birth than males, and they experience lower death rates than males for all ages (see Table S11, page 306 and Table S14, page 308). For 1985–1987, the differential in death rates was highest for young adults, with males having nearly three times the age-standardised rate of females (Table 4.2; Figure 4.1). The next highest differential was for working age adults, where it was almost two-fold. In 1988, the prevalence rates of disability were also higher for males than for females at all ages, although the differentials are much smaller than those for deaths. More serious chronic and recent illnesses were reported for males aged 0 to 14 years than for females, in contrast to males aged 15 years or more, who generally reported fewer illnesses than females. The exception was for serious chronic illness in the 65 years and over age group, where males reported more illnesses than females. Hospitalisation rates were higher for females than males for ages 15 to 54 years, but were higher for males than females for other ages (see Figure 2.13, page 41). Females reported more days of reduced activity than males at all ages.

Males had much higher death rates than females for almost all the major causes of death. For children aged 0 to 14 years, the differences in the leading causes of death were:

- *accidental drowning*—males 171 per cent higher
- *sudden infant death syndrome*—males 59 per cent higher
- *motor vehicle traffic accidents*—males 53 per cent higher
- *hypoxia, birth asphyxia, etc.*—males 36 per cent higher
- *circulatory system congenital anomalies*—males 32 per cent higher
- *chromosomal anomalies*—males 44 per cent lower.

For the 15 to 24 year age group, the major mortality differences were due to:

- *suicide*—males 325 per cent higher
- *motor vehicle traffic accidents*—males 214 per cent higher
- *other injuries*—males 266 per cent higher
- *drug dependence*—males 83 per cent higher
- *cancers*—males 60 per cent higher.

Table 4.2: Health differentials by age group and sex, late 1980s

	Rate[b]		
Age group (years) / Health status indicator[a]	*Males*	*Females*	*Rate ratio*
Children (0–14 years)			
Deaths (per 100,000 population)	102	75	1.35 *
Disability (per cent)	7.0	5.1	1.37 *
Serious chronic illness (number per person)	0.21	0.14	1.42 *
Recent illness (number per person)	0.32	0.30	1.09
Reduced activity (days per person per year)	14.1	15.1	0.93 *
Young adults (15–24 years)			
Deaths (per 100,000 population)	130	47	2.77 *
Disability (per cent)	6.5	5.8	1.12
Serious chronic illness (number per person)	0.15	0.18	0.82 *
Recent illness (number per person)	0.29	0.40	0.72 *
Reduced activity (days per person per year)	17.3	19.1	0.91 *
Working age adults (25–64 years)			
Deaths (per 100,000 population)	450	234	1.92 *
Disability (per cent)	16.3	13.7	1.20 *
Serious chronic illness (number per person)	0.24	0.24	1.00
Recent illness (number per person)	0.54	0.69	0.79 *
Reduced activity (days per person per year)	20.3	25.2	0.81 *
Older people (65 years and over)			
Deaths (per 100,000 population)	6,460	4,021	1.61 *
Disability (per cent)	56.4	47.3	1.19 *
Serious chronic illness (number per person)	0.70	0.54	1.30 *
Recent illness (number per person)	1.46	1.61	0.90 *
Reduced activity (days per person per year)	38.5	41.8	0.92 *

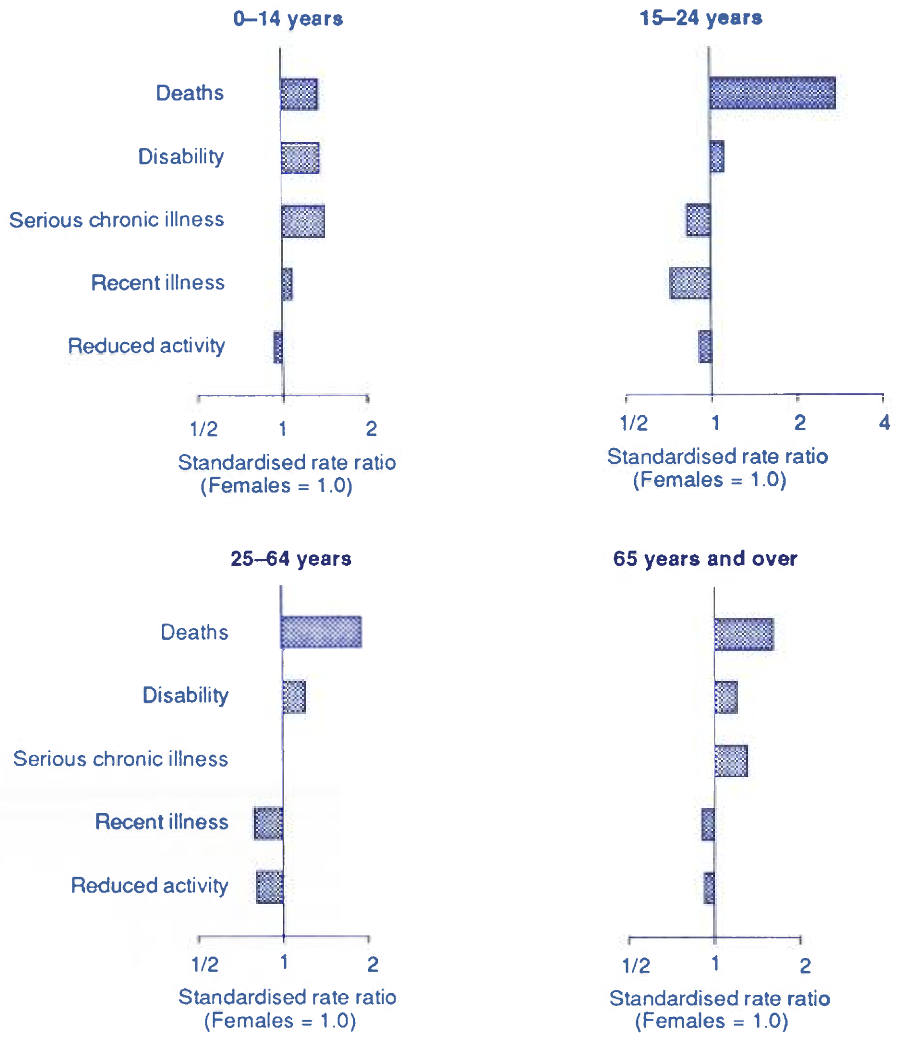
(a) See Box 4.1 for definitions.

(b) All rates age-standardised to 1988 total Australian population.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from 1985–1987 mortality data, ABS 1988 Survey of Disability and Ageing, ABS 1989–90 National Health Survey

Figure 4.1: Health differentials by age group and sex, late 1980s



Source: Australian Institute of Health and Welfare

Refer to Table 4.2

For the 25 to 64 year age group, males had significantly higher death rates than females for all major causes of death except those relating to the genitourinary system (males 29 per cent lower). Those involving large numbers of deaths included:

- *ischemic heart disease*—males 253 per cent higher
- *suicide*—males 252 per cent higher
- *lung cancer*—males 223 per cent higher
- *motor vehicle traffic accidents*—males 170 per cent higher
- *stomach cancer*—males 130 per cent higher
- *stroke*—males 34 per cent higher.

For people aged 65 years or over, males had higher death rates for all major causes of death. Those involving large numbers of deaths included:

- *lung cancer*—males 389 per cent higher
- *bronchitis, emphysema and asthma*—males 197 per cent higher
- *stomach cancer*—males 137 per cent higher
- *ischemic heart disease*—males 70 per cent higher
- *injury and poisoning*—males 64 per cent higher
- *other cancers*—males 57 per cent higher
- *diabetes*—males 25 per cent higher
- *stroke*—males 6 per cent higher.

In terms of illness, males reported more injuries than women, but less disease of the circulatory system. For specific causes, there are clear differences between males and females in the pattern of reported illness, as there are for mortality. For example, the male/female ratio of reported illness is particularly high for gout and ulcer, and low for genitourinary disorders, fluid retention problems and migraine. An earlier national health survey, in 1977–1978, found that women reported more emotional problems than men (Lee et al. 1987), and various studies have found higher rates of mental illness in women (Kane 1991; NHMRC 1991).

The higher levels of illness reported by females are not entirely consistent with documented rates of hospitalisation, which tend to reflect more serious health problems. As noted in 'Evidence of morbidity from hospital admissions' (page 40), the slightly higher overall hospitalisation rates for females than males are due entirely to the higher rates for females than males in the young and middle adult years. In these age groups, a substantial number of the hospital admissions for females are related to pregnancy or other aspects of the female reproductive system. For the younger and older age groups, hospitalisation rates are higher for males than females.

The differences between males and females in mortality, reported illness and hospitalisation reflect a combination of biological, behavioural and environmental factors. For all ages, there are different patterns of illness and mortality. Relatively more of the health conditions of females are linked to their reproductive system and this contributes to the excess in reported ill-health and hospitalisation. Some of the complexities of sex differentials will be considered further in the sections examining differentials by employment status, marital status and household composition.

Socioeconomic differentials

There has been considerable focus in Australia and overseas on the association between socioeconomic disadvantage and health status. Socioeconomic differentials in mortality in Australia have been demonstrated repeatedly (Taylor et al. 1983; McMichael 1985; Siskind, Najman, Copeman 1987), and are often presumed to be of major importance in explaining other health differentials, such as between men and women, between Aborigines and non-Aborigines, and between urban and rural dwellers.

Apart from health surveys, such as the ABS National Health Survey and the Risk Factor Prevalence Surveys conducted by the National Heart Foundation, information about socioeconomic status is not, however, generally collected with health-related data. For example, death registration forms provide only for the recording of occupation and, as explained below, the quality of this information is poor, particularly for women.

Socioeconomic status is not easily conceptualised or quantified. The proxy measures most often used for socioeconomic status are level of education, occupation, occupational status (or prestige), income and composite indices of social class. Aggregate socioeconomic characteristics of the populations of defined geographical areas can be used also to assess the relationship between socioeconomic status and health status. The value of such geographical indices decreases as the size of the area increases, as larger areas are likely to be more heterogeneous than smaller ones.

These proxy indicators measure different aspects of socioeconomic circumstances. For example, income is an important indicator of a person's current level of economic resources, although it does not always correlate closely with individual or family expenditure, or with actual economic resources. Education and occupation can be poor indicators of current income, but may better reflect asset ownership, or potential to accumulate wealth over a lifetime. Education can also indicate capacity to assimilate information and access to health services.

Differentials by education

For people aged 25 years or more, education level has been defined in terms of the age at which the person left school and qualifications gained since leaving school (Box 4.3).

Working age males and females classified as being of low education reported significantly more serious chronic illness and reduced activity than did males and females with high education (Table 4.3). Reported numbers of recent illnesses were also around 12 per cent higher for males and females with low education than for those with high education (only the difference for females is statistically significant). In contrast, there were no significant differences in reported illness levels for older people, and small but uneven differentials for reported levels of reduced activity due to illness. The male children of parents with low education tended to report more serious chronic illness, but the differences are not statistically significant and did not occur for girls at all.

Specific chronic illnesses reported significantly more frequently by working age adults with low education than by those with high education include:

- *arthritis*—28 per cent more for males and 42 per cent more for females
- *hypertension*—27 per cent more for males and 52 per cent more for females
- *bronchitis and emphysema*—around 70 per cent more for males and 50 per cent more for females
- *ulcer*—150 per cent more for males and 90 per cent more for females.

Around twice as many males and females with high education reported hay fever compared to males and females with low education. Varicose veins were also reported more frequently by people with high education. High cholesterol levels were reported significantly less frequently for males with low education, but there were no significant differentials for females.

Box 4.3: Education categories

Low	*No schooling or left before age 15, no qualifications since.*
Medium	*Left school before age 15, qualifications since* or *left school at age 15 or more, no qualifications since.*
High	*Left school at age 15 or more, qualifications since.*

The reported numbers of serious chronic illnesses increase as education level and family income decrease. This is not simply because low education is associated with low income. Within each education level, lower income was associated with more reported serious chronic illness (Table 4.4). Similarly, there is a trend towards more reported illness with lower education level within income groups, although the relationship is not as clear-cut. Males with low education and low income reported 123 per cent more serious chronic illnesses than did males with high education and high income. The corresponding differential for females is 64 per cent.

Table 4.3: Morbidity differentials by education level, age group and sex[(a)], 1989–1990

Rate ratio[(b)]

	Serious chronic illness		*Recent illness*		*Reduced activity*	
Age group / Education level	*Males*	*Females*	*Males*	*Females*	*Males*	*Females*
Children (0–14 years)[(c)]						
High	1.00	1.00	1.00	1.00	1.00	1.00
Medium	1.09	1.00	0.96	0.96	1.04	1.29 *
Low	1.20	1.01	0.94	0.93	1.35 *	0.95
Working age adults (25–64 years)						
High	1.00	1.00	1.00	1.00	1.00	1.00
Medium	1.22 *	1.06	1.04	0.98	1.20 *	0.97
Low	1.56 *	1.33 *	1.11	1.12 *	1.59 *	1.22 *
Older people (65 years and over)						
High	1.00	1.00	1.00	1.00	1.00	1.00
Medium	1.11	0.91	1.07	1.02	1.18 *	0.93 *
Low	1.02	1.02	0.99	1.08	1.06	1.20 *

(a) Refer to Box 4.3 for definition of education levels. Young adults aged 15–24 years are excluded as many have not completed their education.

(b) All rates age-standardised to 1988 Australian population.

(c) Childen aged 0–14 years are classified according to the education level of the parent with the highest education level.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from ABS 1989–90 National Health Survey

Table 4.4: Serious chronic illness differentials[(a)] by education level, equivalent family income[(b)] and sex, age 25–64 years, 1989–1990

Rate ratio [(c)]

	Equivalent family income		
Education level	*High*	*Medium*	*Low*
Males			
High	1.00	1.08	1.57 *
Medium	1.13	1.24 *	1.76 *
Low	1.14	1.18	2.23 *
Females			
High	1.00	1.16	1.17
Medium	1.00	1.08	1.34 *
Low	1.05	1.12	1.64 *

(a) Ratio of average number of serious chronic illnesses to that for persons with high income and high education.

(b) See Boxes 4.3 and 4.6 for definitions.

(c) All rates age-standardised to 1988 Australian population.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from ABS 1989–90 National Health Survey

Employment differentials

In Australia, most work on health differentials according to socioeconomic status has concentrated on mortality differentials according to occupation recorded in the process of death registration (see for example, Dasvarma 1977; McMichael 1985). However, variation between States and Territories in the information collected, particularly in relation to retired people, poses difficulties. The majority of States and Territories specifically ask for the former occupation (or occupation during working life) of retired people to be recorded, but Western Australia and the Australian Capital Territory do not. To minimise the effects of possible misclassification of retired decedents, this analysis of mortality differentials by occupation has been restricted to people aged 25 to 54 years.

For females, there are substantial problems with occupational information, as occupation of female decedents has only been collected on death registration forms since 1985. For 1985–1987, the information recorded was so incomplete it precluded meaningful analysis of the mortality of females by occupation. For example, around 50 per cent of females aged 25 to 54 years are employed (according to the 1986 census and the ABS labourforce surveys), but only 20 per cent of female deaths occurring for this age range in 1985–1987 had an occupation recorded. As a result, the death rate for 'not employed' females was more than three times that of employed females. The apparent substantial under-recording of occupation for female deaths, especially for those in blue-collar occupations, also produced an unlikely three-fold excess of death rates for women with administrative or managerial occupations over those with blue-collar occupations.

In 1985–1987, males aged 25 to 54 years who were unemployed or not in the labourforce had an age-standardised death rate of 248 per 100,000 (see Glossary for definitions of employment categories). This is 17 per cent higher than the death rate of 211 per 100,000 for employed males (Table 4.5). The prevalence of disability among

Table 4.5: Health differentials by employment status and sex, age 25–64 years[(a)], late 1980s

	Rate ratio[(b)]		
Sex / Health status indicator	*Employed*	*Unemployed*	*Not in labourforce*
Males			
Deaths	1.00	[(c)]1.17 *	—
Disability	1.00	1.66 *	5.13 *
Serious chronic illness	1.00	1.26	2.46 *
Recent illness	1.00	1.21 *	2.17 *
Reduced activity	1.00	2.01 *	4.06 *
Females			
Deaths	1.00	(d)	—
Disability	1.00	1.29	1.91 *
Serious chronic illness	1.00	1.42 *	1.27 *
Recent illness	1.00	1.34 *	1.22 *
Reduced activity	1.00	1.28 *	1.51 *

(a) Death rates for persons aged 25–54 years.

(b) All rates age-standardised to 1988 Australian population.

(c) Includes males not in labourforce.

(d) Not shown because of problems with data quality. See text for details.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from 1985–1987 mortality data, ABS 1988 Survey of Disability and Ageing, ABS 1989–90 National Health Survey

unemployed males is 66 per cent higher than that among employed males. The much greater differential between employed males and males not in the labourforce (over 400 per cent) probably reflects selection effects to a substantial degree, with existing disability resulting in difficulty in obtaining employment. The differentials in disability between employed and other females are somewhat smaller—29 per cent for unemployed females and 91 per cent for females not in the labourforce. Of course, other factors, such as childbearing and social structures, play a larger role in whether women are participating in the labourforce.

Unemployed men and women also reported higher levels of chronic and recent illness and more days of reduced activity due to illness than did employed men and women (Table 4.5) The levels of illness and reduced activity were highest for men not in the labourforce, but illness levels among women not in the labourforce were intermediate between those for employed and unemployed women.

There has been considerable debate about the relationship between unemployment and ill-health. Some have argued that ill-health 'selects' people into unemployment but others contend that economic conditions affect health (see Bartley 1991 for a review of the subject).

In Britain, long-term follow-up studies have demonstrated a mortality differential of up to 50 per cent between employed and unemployed men and women, and that the differential increases with time (Moser et al. 1987). Although some degree of selection due to ill-health does occur, it cannot explain the long-term excess mortality experienced by the unemployed, and much of the excess must be related to factors associated with unemployment itself (Fox, Goldblatt, Jones 1990).

Occupational differentials

Among employed males aged 25 to 54 years, those with occupations classified as professional/technical (see Box 4.4 for details of the CCLO and ASCO classifications of occupations) had the lowest death rate (149 per 100,000) and those classified as transport/communications had the highest (279 per 100,000), with a differential of 87 per cent (Figure 4.2). Most major causes of death show strong occupational gradients, including death rates from lung cancer, diabetes, ischemic heart disease, respiratory diseases and injury. Some of these mortality differentials are considered in the section 'Occupational prestige' (page 187).

The prevalence of disability among working age men by ASCO occupation group shows a similar but smaller gradient to that for mortality (Table 4.6). For plant and machine operators and for labourers, the prevalence of disability is more than 40 per cent higher than it is for professionals. In contrast, there are no distinct gradients among employed men for illness or reduced activity, but manual workers tended to report lower numbers of recent illnesses than did non-manual workers (Table 4.6).

For women, the pattern of disability and illness by occupation is quite different (Table 4.6). Managers and administrators and manual workers reported much lower levels of disability than did professionals and para-professionals, whereas tradespersons reported 43 per cent more disability. It is uncertain whether these differences relate to differences in reporting behaviour, selection and discrimination effects in the labourforce, or whether injury and working conditions affect levels of disability. For women, as for men, there are no clear patterns of illness and reduced activity by broad occupation group.

Box 4.4: Occupation groups

Occupation has been coded for death registration data until 1990 using the CCLO classification of occupations (ABS 1987). This classification has been superseded by the ASCO classification (ABS 1986) which was also used for the classification of occupation in the 1988 Survey of Disability and Ageing and the 1989–90 National Health Survey. The CCLO classification is partially based on industry classifications and does not relate well to measures of socioeconomic status. The ASCO classification was developed to redress some of the problems with the CCLO classification and is based on a task-related categorisation of occupations in terms of skill and responsibility levels. However, it is unclear whether the ASCO hierarchy of occupations provides an adequate measure of socioeconomic status (Najman, Bampton 1991). Because of the changes in the classification systems, the mortality analysis presented here uses the CCLO system and the other analyses use the ASCO system.

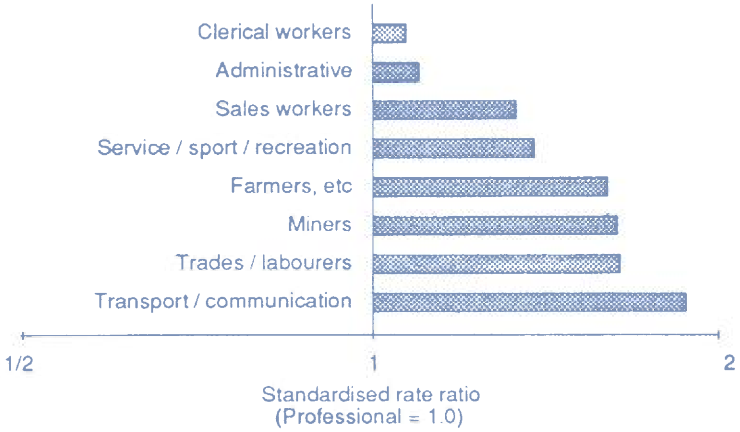
CCLO Major Occupation Groups

0	*Professional, technical and related workers*
1	*Administrative, executive and managerial workers*
2	*Clerical workers*
3	*Sales workers*
4	*Farmers, fishers, hunters, timber getters and related occupations*
5	*Miners, quarrymen and related workers*
6	*Transport and communication*
7/8	*Tradesmen, production process workers and labourers*
9	*Service, sport and recreation*
10	*Members of armed services*

ASCO Major Occupation Groups

1	*Managers and administrators*
2	*Professionals*
3	*Para-professionals*
4	*Tradespersons*
5	*Clerks*
6	*Salespersons and personal service workers*
7	*Plant and machine operators, and drivers*
8	*Labourers and related workers*

Figure 4.2: Mortality differentials by CCLO major occupation group[a], males aged 25–54 years, 1985–1987



(a) See Box 4.4 for details of CCLO occupation groups.

Source: Australian Institute of Health and Welfare

Refer to Appendix 1, Table A37

Table 4.6: Differentials in morbidity rates by ASCO major occupation group[a] and sex, age 25–64 years, late 1980s

		Rate ratio[b]			
Major occupation group		*Disability prevalence*	*Serious chronic illness*	*Recent illness*	*Reduced activity*
Males					
1	Managers and administrators	1.21	1.03	0.94	0.80 *
2	Professionals	1.00	1.00	1.00	1.00
3	Para-professionals	1.19	1.21	0.90	1.23 *
4	Tradespersons	1.18	0.97	0.87	0.96
5	Clerks	1.27	1.23	1.08	1.02
6	Sales and personal service	1.33	1.20	0.89	0.73 *
7	Plant and machine operators	1.47 *	1.16	0.87	1.05
8	Labourers and related workers	1.44 *	1.18	0.81 *	1.00
Females					
1	Managers and administrators	0.70	0.83	0.90	0.98
2	Professionals	1.00	1.00	1.00	1.00
3	Para-professionals	1.01	1.08	1.04	1.00
4	Tradespersons	1.43	1.20	1.05	1.13
5	Clerks	0.90	0.94	0.97	0.89 *
6	Sales and personal service	0.98	1.10	1.01	0.72 *
7	Plant and machine operators	0.58	1.00	0.63 *	0.98
8	Labourers and related workers	0.79	1.22	0.90	0.92

(a) See Box 4.4 for details of ASCO major occupation groups.

(b) Age-standardised to 1988 Australian population.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from ABS 1988 Survey of Disability and Ageing, ABS 1989–90 National Health Survey

Occupational prestige

Mortality differentials according to occupational prestige have been analysed for Australian males in terms of quintiles and deciles of prestige using the ANU2 scale (see Box 4.5).

For male deaths occurring in 1985–1987, there is a very striking gradient in age-standardised death rates. Males in the quintile of lowest occupational prestige had a death rate 95 per cent higher than those in the quintile of highest occupational prestige (Figure 4.3). In terms of deciles of occupational prestige, the differential is even higher, with the lowest decile having a death rate almost two-and-a-quarter times that of the highest decile. The underlying differentials are almost certainly even higher, since many of the occupational codes used to code death registrations contain a range of occupational prestige. The mean prestige level has been used to classify the deaths into quintiles.

These differentials occur consistently across eight of the nine major cause of death groupings (Figure 4.4). Of greatest importance at the population level are the more than two-fold differentials for circulatory diseases and injuries, which are the major causes of death in this age group. The differentials are more than ten-fold for deaths due to mental and genitourinary disorders, but these are responsible for only small numbers of deaths.

Box 4.5: Occupational prestige

In attempts to more closely relate health and other outcomes to occupation, various indices have been constructed of occupational prestige, widely considered to be the most powerful single indicator of social advantage (Quine 1986). One such index is the ANU2 scale (Broom et al. 1977), which ranks occupations (defined by the three-digit CCLO classification) according to occupational prestige as perceived by the community.

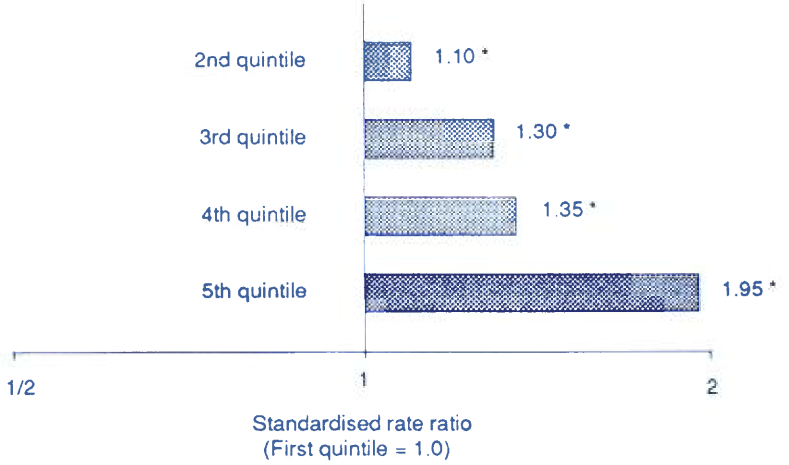
Data from the 1986 Census of Population and Housing (ABS 1987) were used to calculate the mean ANU2 score for each of the occupation categories used for death registration data (coded until 1990 according to a two-digit scheme based on the CCLO classification). The occupation categories were ranked by mean ANU2 score and grouped into population quintiles and deciles of occupational prestige. The first quintile corresponds to high prestige occupations and the fifth to low prestige occupations.

Major occupational category by quintile of occupational prestige, males, age 25–54 years, 1986

(Per cent)

		Prestige quintile				
CCLO group		1	2	3	4	5
0	Professional, tech. & related	48	22	0	0	0
1	Admin., exec. & managerial	51	0	0	0	0
2	Clerical workers	0	42	0	1	0
3	Sales workers	0	0	35	0	0
4	Farmers, fishers etc.	0	23	9	3	1
5	Miners, quarrymen & related	0	0	0	1	5
6	Transport & communication	1	1	1	30	5
7	Tradesmen, process workers	0	11	36	55	17
8	Labourers	0	0	0	6	59
9/10	Service etc., armed services	0	1	20	4	14
All		100	100	100	100	100

Figure 4.3: Mortality differentials by quintile of occupational prestige, males aged 25–54 years, 1985–1987



* $p < 0.01$

Source: Australian Institute of Health and Welfare

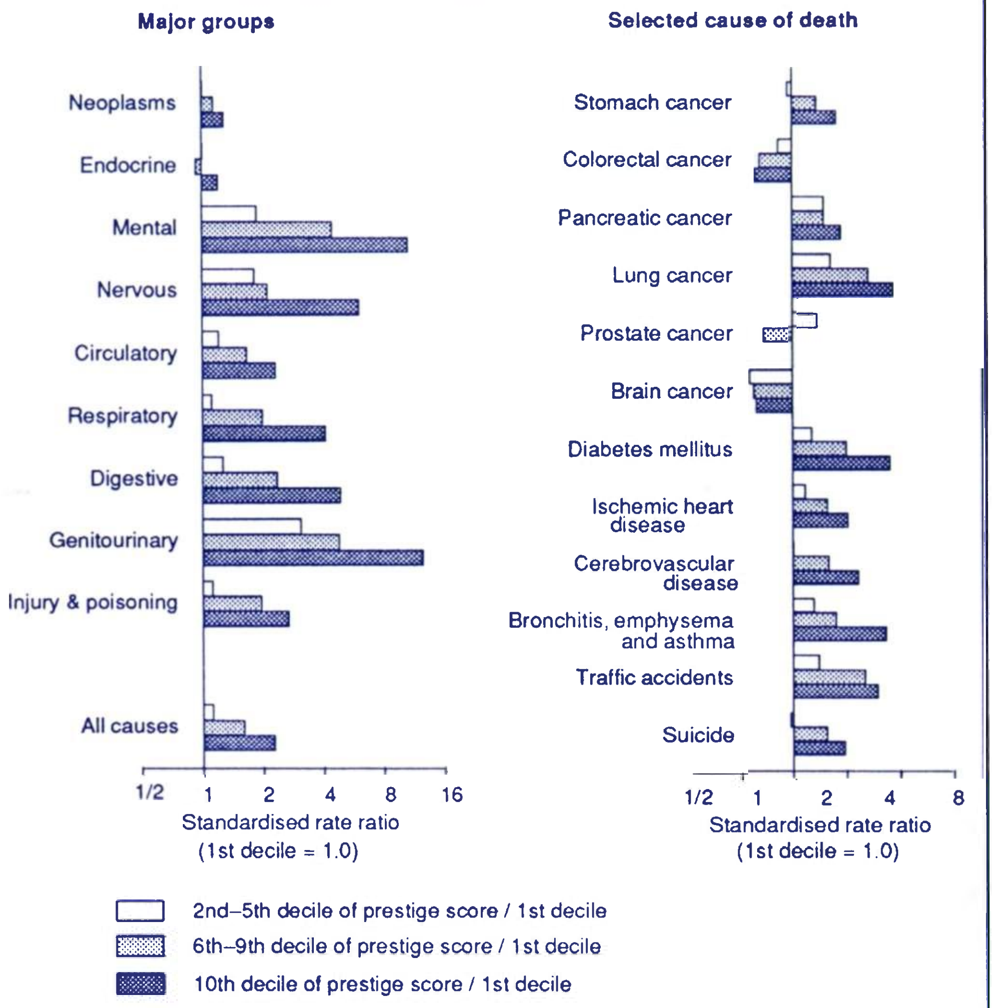
The small differentials for deaths due to all cancers reflect the diverse nature of cancers, with the result that some cancers are more common among disadvantaged groups, while others are less common. From the 1985–1987 mortality data, the high differentials for cancers such as lung cancer (260 per cent higher in the lowest decile) are partly offset by the differentials for other cancers, such as colorectal and brain cancer, for which death rates were lower in males with lower prestige occupations (Figure 4.4).

There are around three-fold differentials between high and low occupational prestige groups in deaths from bronchitis, emphysema and asthma, diabetes mellitus and motor vehicle traffic accidents, and around two-fold differentials for ischemic heart disease, cerebrovascular disease and suicide.

Income

The 1989–90 NHS data on the prevalence of illness conditions can be assessed in relation to a more direct indicator of socioeconomic status, that of income. Information provided by respondents about gross annual income for all people aged 15 years or older has been used to estimate gross annual family income and 'equivalent' family income adjusted for family composition (see Box 4.6). This adjustment takes account of the fact that the more adults or children in a family, the greater is the income required to achieve an equivalent purchasing power at the individual level. Because of the difficulties in accurately assessing the income of young adults, their results should be treated with caution.

Figure 4.4: Mortality differentials by occupational prestige and cause of death, males aged 25–54 years, 1985–1987



Source: Australian Institute of Health and Welfare *Refer to Appendix 1, Tables A38 and A39*

Box 4.6: Family income categories

The 1989–90 National Health Survey collected information on gross annual income for all persons aged 15 years and over. These data were used to estimate gross annual income for families (or income units) with a maximum of two adults. Income units are defined as one non-dependent adult (nominally termed the head of the household) plus persons normally living in the same household assumed to be dependent on the head. The latter may include spouse (if married) or defacto, all children aged less than 15 years in the same family and unmarried full-time students aged 15 to 25 years without dependents of their own and who are living with their parents (ABS 1991).

Gross family income is not necessarily a good indicator of economic purchasing power since families of different compositions require different amounts of income to reach the same capacity to pay for necessities of daily living. The concept of equivalent income enables the statistical adjustment of income to account for differences in family composition and size. The gross family income has been divided by the relevant equivalence factor shown in Table A to obtain an 'equivalent family income' for each individual. Equivalent family income has been classified into three categories, shown in Table B, defined for each age group so that there are approximately equal numbers of persons in each category.

Table A: Henderson simplified equivalence scales

Income unit composition		(Equivalence factor)	
Adults	Children	Either adult working	Neither adult working
1	—	0.75	0.61
1	1	0.96	0.82
1	(a)2	1.16	1.02
2	—	1.00	0.86
2	1	1.20	1.06
2	(a)2	1.40	1.26

(a) For each subsequent child, add 0.20 to relevant factor.

Table B: Lower boundaries for equivalent income categories, by age group

($)

	Age group (years)			
Income category	0–14	15–24	25–64	65 +
High	32,890	32,890	39,560	18,980
Medium	18,980	18,980	23,400	12,150
Low	—	—	—	—

Generally, the numbers of serious chronic and recent illnesses and the average days of reduced activity reported by men and women rise as equivalent family income decreases (Table 4.7). For example, low income working age males and females reported respectively 65 and 33 per cent more serious chronic illness than did high income working age males and females. The differentials for children and young adults were lower but still substantial, whereas there were no differences in illness levels for older men and women.

Specific chronic illnesses reported as occurring significantly more frequently by working age adults in low income families than by those in high income families include:

- *asthma*—34 per cent more for males and 25 per cent more for females
- *arthritis*—35 per cent more for males and 42 per cent more for females
- *bronchitis and emphysema*—87 per cent more for males
- *ulcer*—120 per cent more for males and 55 per cent more females.

Hay fever was reported about 30 per cent more frequently by both males and females in high income families.

Children in low income families reported asthma as occurring significantly more frequently by 33 per cent for boys and 26 per cent for girls. As with adults, hay fever was reported more frequently by both boys and girls in high income families.

Socioeconomic disadvantage

Analysis of mortality by occupation-related measures of socioeconomic status is not sufficient for the examination of differentials for children, retired people, and, given the problems with recording of occupational data for female deaths, women. An alternative approach is to look at variations in mortality rates by grouping residential localities according to socioeconomic criteria. In Australia, a number of such studies have documented variations in infant and adult mortality (McNeil et al. 1990; Siskind, Najman, Copeman 1987).

Using a small area index of socioeconomic disadvantage (see Box 4.7), age-standardised death rates have been analysed by quintile of socioeconomic disadvantage. For males and females, there is a clear gradient of increasing mortality

Table 4.7: Morbidity differentials by equivalent family income[(a)], age group and sex, 1989–1990

	Rate ratio[(b)]					
Age group /	*Serious chronic illness*		*Recent illness*		*Reduced activity*	
Family income	*Males*	*Females*	*Males*	*Females*	*Males*	*Females*
Children (0–14 years)						
High	1.00	1.00	1.00	1.00	1.00	1.00
Medium	1.25 *	0.98	1.11	0.92	0.83 *	0.92
Low	1.42 *	1.24	1.13	0.90	1.10	0.91
Young adults (15–24 years)						
High	1.00	1.00	1.00	1.00	1.00	1.00
Medium	1.02	1.22	0.81 *	0.88	0.96	0.86 *
Low	1.23	1.45 *	0.82	0.92	1.19 *	1.14 *
Working age adults (25–64 years)						
High	1.00	1.00	1.00	1.00	1.00	1.00
Medium	1.10	1.09	0.93	1.05	1.01	1.09 *
Low	1.65 *	1.33 *	1.29 *	1.25 *	1.77 *	1.47 *
Older people (65 years and over)						
High	1.00	1.00	1.00	1.00	1.00	1.00
Medium	1.00	1.03	1.06	1.08	1.23 *	1.06 *
Low	0.89	0.96	0.87	1.00	0.82 *	1.28 *

(a) Refer to Box 4.6 for definition of income groups.

(b) All rates age-standardised to 1988 Australian population.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from ABS 1989–90 National Health Survey

with increasing level of socioeconomic disadvantage of area of residence for all age groups (Figure 4.5). Working age males living in areas classified into the quintile of greatest socioeconomic disadvantage had death rates 67 per cent higher than males living in areas in the quintile of least disadvantage. For working age females, there was a slightly smaller differential (49 per cent). The differentials for girls (63 per cent) and young women (49 per cent) were somewhat greater than those for boys and young men (46 per cent for each group).

Older people had lower gradients in mortality, with those in the quintile of greatest socioeconomic disadvantage having death rates around 10 per cent higher than older people in the quintile of least disadvantage. However, as the majority of deaths occur in that age group, this small percentage differential translates into a large difference in the absolute number of deaths.

Box 4.7: Index of Relative Socioeconomic Disadvantage

The Australian Bureau of Statistics has constructed a number of socioeconomic indices designed to categorise areas on the basis of social and economic information collected in the 1986 Census of Population and Housing (ABS 1990b). The indices were compiled at small geographic levels known as Collection Districts (CDs) and then aggregated to larger geographic areas such as postcodes or statistical local areas (SLAs). A CD is roughly equivalent to a small group of suburban blocks in urban areas.

The Index of Relative Socioeconomic Disadvantage was constructed by summarising information from a number of underlying social and economic variables relating to socioeconomic disadvantage, such as low income, relatively low educational attainment levels and high unemployment. It is designed so that the CDs have a mean index value of 1,000 with a standard deviation of 100. An area has a low value of this index if it contains a large proportion of comparatively disadvantaged households.

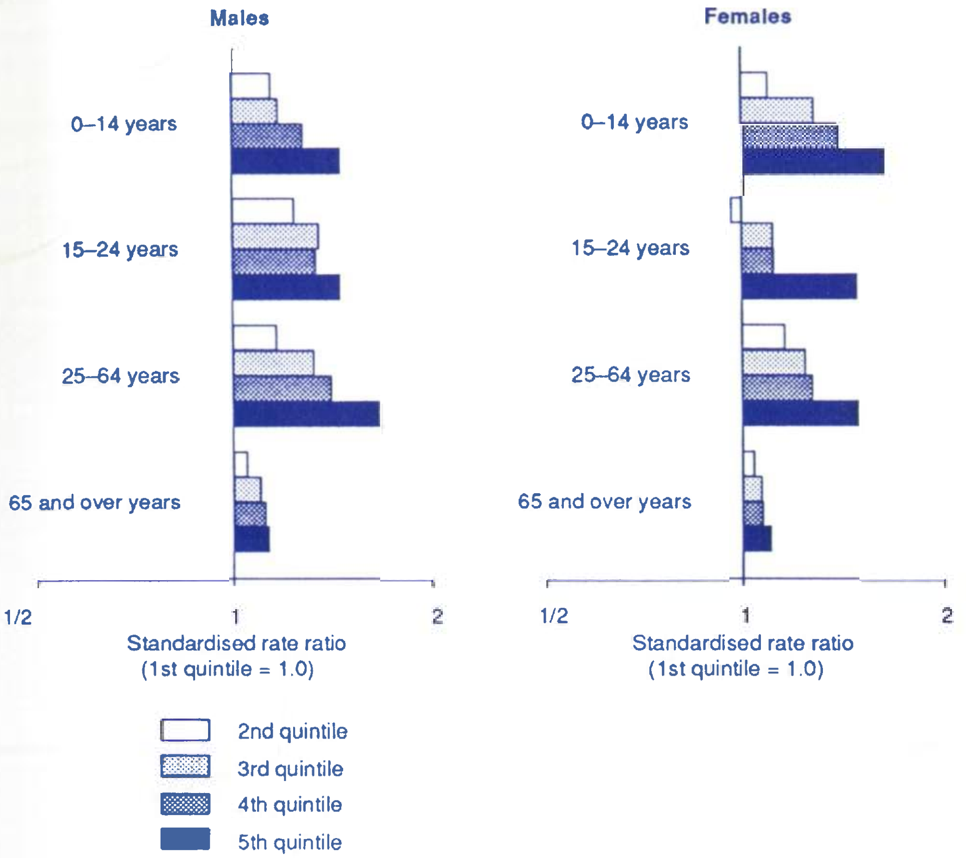
The Index of Relative Socioeconomic Disadvantage was compiled from the following set of variables (in all cases expressed as ratios or percentages of the relevant population):

- *family income of less than $12,000*
- *households with no motor cars*
- *households with one or no bedrooms*
- *households renting (non-government)*
- *households renting (government authority)*
- *households in improvised dwellings*
- *no qualifications*
- *left school at less than 15 years of age*
- *never at school*
- *employed males classified in trades*
- *employed females classified in trades*
- *employed females classified in sales /personnel*
- *employed, classified as labourer or related*
- *males unemployed*
- *females unemployed*
- *families consisting of head and dependents*
- *aged 15 or over and separated or divorced*
- *occupied dwellings with two or more families*
- *Aboriginal or Torres Strait Islanders*
- *recent migrant from non-English speaking*
- *lacking English fluency.*

Mortality data supplied by ABS contains the SLA of usual residence of the deceased person. In most cases, SLAs correspond to local government areas' defined council boundaries (ABS 1990b). All SLAs in Australia were classified into quintiles (containing equal numbers of people aged 25–64 years) of socioeconomic disadvantage according to the average value of the Index of Relative Socioeconomic Disadvantage.

The first quintile contains persons living in the least disadvantaged areas and the fifth quintile contains persons living in the most disadvantaged areas.

Figure 4.5: Mortality differentials by quintile of socioeconomic disadvantage(a), age group and sex, 1985–1987



(a) Index of socioeconomic disadvantage for statistical local area of residence (see Box 4.7).

Source: Australian Institute of Health and Welfare

Refer to Appendix 1, Table A40

It is important to note that these differentials relate the mortality of all people living in a geographic area to the overall level of socioeconomic disadvantage of that area. Most areas will contain varying levels of individual socioeconomic disadvantage and, to the extent that the increased risk of mortality is associated with individual economic circumstances and living conditions rather than communal environment, the differentials will understate the true differences in mortality according to socioeconomic disadvantage.

Conclusion

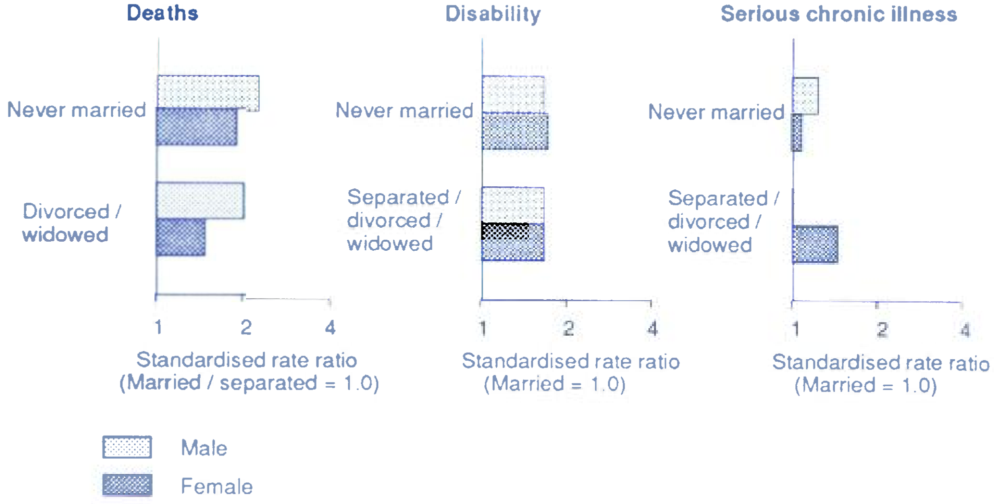
By all measures of socioeconomic status (as measured by education level, occupation, occupational prestige, equivalent family income and areas of socioeconomic disadvantage), there is a consistent relationship in Australia between socioeconomic status and health. For all age groups, males and females with lower socioeconomic status have higher death rates (up to two-fold differences for all-causes mortality and three-fold or four-fold differences for some major causes of death), and report higher levels of illness and reduced activity due to illness. These differences are generally greatest for people of working age. Education level and family income appear to be independently associated with health status.

Marital status and family composition

For males and females aged 25 to 64 years, there were very large differences in mortality between married and unmarried people in 1985–1987 (Figure 4.6). Never married, widowed and divorced men experienced more than twice the mortality of married men. Never married women also experienced nearly twice the mortality of married women, whereas for widowed and divorced women the differential is around 1.5. Significant differences occur for all the major causes of death, although the differentials for cancer are not nearly as pronounced. For both men and women, the prevalence of disability for never married, divorced or widowed people is around 70 per cent higher than that for married people. In contrast, there is relatively little difference in reported chronic or recent illness by marital status.

Some of the differentials according to marital status may reflect selection effects, in that people with poor health may be less likely to marry and more likely to separate

Figure 4.6: Health differentials by marital status and sex, age 25–64 years, late 1980s



Source: Australian Institute of Health and Welfare

Refer to Appendix 1, Table A41

and divorce. On the other hand, there is evidence that marriage provides increased social integration and social support, resulting in improved health and wellbeing (Ladbrook 1990). It has also been proposed that parenthood inhibits risky and erratic behaviour, and is associated with a more careful lifestyle. Overseas studies have found that women who do not have children living with them have higher death rates than those who do, particularly in the age group 35 to 44 years (Umberson 1987).

Data are not available to permit an examination of Australian death rates by family composition. However, single mothers aged 25 to 64 years reported significantly more illness and reduced activity than did women with partners and dependent children (Figure 4.7). Compared with these women, female single parents reported:

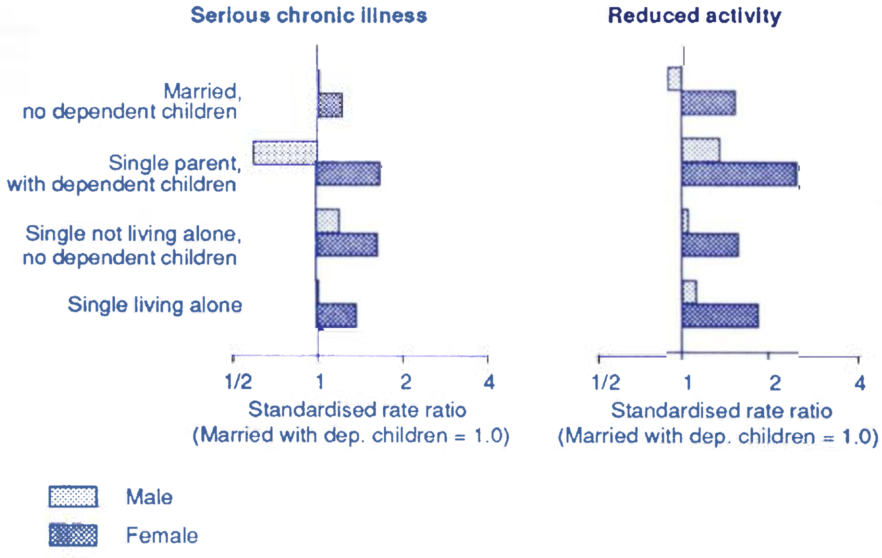
- 69 per cent more serious chronic illnesses
- 35 per cent more recent illnesses
- 150 per cent more days of reduced activity.

Specific chronic illnesses which were reported significantly more frequently are bronchitis and emphysema (153 per cent higher) and ulcer (over 400 per cent higher).

Single women without dependent children also reported significantly more illness and reduced activity:

- 65 per cent more serious chronic illnesses if living with others (39 per cent more if living alone)
- over 40 per cent more recent illnesses
- over 60 per cent more days of reduced activity.

Figure 4.7: Morbidity differentials by family composition and sex, age 25–64 years, 1989–1990



Source: Australian Institute of Health and Welfare

Refer to Appendix 1, Table A42

Specific chronic illnesses which were reported significantly more frequently are:

- *bronchitis and emphysema*—nearly 200 per cent higher
- *ulcer*—around 260 per cent higher
- *high cholesterol*—around 200 per cent higher
- *deafness*—around 170 per cent higher
- *arthritis*—around 50 per cent higher.

Married women aged 25 to 64 years without dependent children did not report significantly more serious chronic illness, but reported almost as much recent illness and reduced activity as did single women without dependents.

Levels of illness and reduced activity among men aged 25 to 64 years did not differ by family composition nearly as much as they did for women (Figure 4.7). Single men with dependent children reported over 40 per cent less serious chronic illness and 6 per cent less recent illness than did married men with children, although they had significantly more days of reduced activity (35 per cent higher). This may reflect some health selection effect, as male single parents are relatively few and perhaps atypical (approximately 45,200 male compared with 257,000 female single parents).

A British study found that married women aged less than 40 years with dependent children reported higher levels of illness if working full-time, although this was less clear among women working in professional and managerial jobs (Arber, Gilbert, Dale 1985). It was proposed that full-time work for young mothers could be detrimental to their health unless there were adequate financial resources to help with the burden of maintaining the multiple roles of housewife, mother and employee, or until the gender imbalances in the division of housework changed. For women without children and for women aged 40 years or more with children, paid employment was associated with better health. Paid employment alone was the major determinant of health for men.

Analysis of Australian health differentials according to family composition and employment status gives similar results to the British study. Serious chronic illness and recent illness rates vary significantly according to whether men were in the labourforce or not, but this pattern is unaffected by family composition, apart from the very small group of single parents (Tables 4.8 and 4.9). Women present a very different pattern of health differentials by employment status and family composition. Married women with dependent children show no significant differentials according to employment status. Indeed, such women reported less serious chronic illness if not in the labourforce, although this difference is not statistically significant (Table 4.8). Except for married women with dependent children, women reported significantly more serious chronic and recent illness if they were not in the labourforce (Tables 4.8 and 4.9). This included single mothers not in the labourforce, who reported over 100 per cent more serious chronic illness and 45 per cent more recent illness than did working single mothers. Unemployed women without dependent children reported significantly more illness than did employed women, whether they were single or married. These differentials are greater than the corresponding differentials for men.

The very different profiles of adult male and female health status by family composition probably reflect gender differences in parenting, family and caregiving roles and labourforce participation (Bittman 1991). Illness levels for married men are unrelated to parental status, unlike those for women, and are probably dominated by selection effects (although there is evidence from overseas studies that unemployment is causally related to ill-health—see 'Employment differentials', pages 183–184).

Table 4.8: Serious chronic illness differentials(a) by employment status, family composition and sex, age 25–64 years, 1989–1990

Rate ratio(b)

	Family composition			
	Couple		*Single*	
Employment status	*With dependent children*	*Without dependent children*	*With dependent children*	*Without dependent children*
Males				
Employed	1.00	1.05	0.66	0.99
Unemployed	0.96	0.97	(c)	1.32
Not in labourforce	2.44 *	2.04 *	1.37	3.02 *
Females				
Employed	1.00	1.01	0.95	1.17
Unemployed	1.02	1.30	1.77	2.26 *
Not in labourforce	0.86	1.47 *	1.93 *	2.16 *

(a) Ratio of average number of serious chronic illnesses to that for employed married persons with dependent children.

(b) All rates age-standardised to 1988 Australian population.

(c) Insufficient numbers in survey.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from ABS 1989–90 National Health Survey

Table 4.9: Recent illness differentials(a) by employment status, family composition and sex, age 25–64 years, 1989–1990

Rate ratio(b)

	Family composition			
	Couple		*Single*	
Employment status	*With dependent children*	*Without dependent children*	*With dependent children*	*Without dependent children*
Males				
Employed	1.00	1.05	0.78	0.91
Unemployed	1.14	1.38	(c)	1.11
Not in labourforce	2.68 *	2.13 *	1.71	2.01 *
Females				
Employed	1.00	1.27 *	1.07	1.36 *
Unemployed	1.22	1.85 *	1.69	2.09 *
Not in labourforce	1.21	1.59 *	1.55 *	1.90 *

(a) Ratio of average number of serious chronic illnesses to that for employed married persons with dependent children.

(b) All rates age-standardised to 1988 Australian population.

(c) Insufficient numbers in survey.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from ABS 1989–90 National Health Survey

The health status of married women with dependent children was not related significantly to employment status, whereas that for other women, including single parents, was strongly related. Employed married women reported very similar illness levels whether or not they had dependent children. This suggests that, in Australia, multiple role stress is not reducing the health of the former group as suggested by the British study (Arber, Gilbert, Dale 1985), and that selection and/or causal factors associating ill-health with being out of the labourforce do not operate for married women with dependent children.

Analyses of the relationship between women's health and their socioeconomic situation are difficult because it is not easy to measure the socioeconomic status of married women. The economic position of a married woman may not be adequately reflected by examining either her own occupation or income, or her husband's occupation or income. Household income should be a better measure of the economic position of married women, but it may not be equally shared. The pressures on married women, particularly those with children, are very different to those on married males with children, largely because of the typically unequal distribution of household tasks and child-rearing responsibilities (Bittman 1991).

Overseas studies have shown that to examine fully the differences in female health status it is necessary to understand the combined impact of work status, economic status, marital status and parenting responsibility (Blaxter 1990; Moser et al. 1990; Arber 1990). For example, the highest standardised mortality ratios for married women in Britain were experienced by those in manual occupations married to men in manual occupations living in rental housing and having no car. Also, the wives of unemployed men had much higher mortality rates than did the wives of employed men (Moser, Pugh, Goldblatt 1990). It is not clear that similar differentials exist for men.

Geographical differences

Differentials in health status between the States and Territories of Australia are much smaller than socioeconomic and family composition differentials, but there are differences which are significant, both statistically and in terms of the population burden of illness and mortality (Table 4.10). In particular, the death rates for 25 to 64 year old males and females in the Northern Territory were around 80 per cent higher than the national average. Death rates for the Australian Capital Territory, Western Australia, South Australia, and, to a lesser extent, Victoria were lower than the national average, while those for Tasmania, New South Wales and Queensland males were above the average.

Death rates for children aged 0 to 14 years did not differ significantly from the national average, except for the Northern Territory (75 per cent higher for boys and 99 per cent higher for girls) and Tasmania (26 per cent higher for boys, but not significantly higher for girls). Death rates for young adults were 50 per cent higher than the national average for the Northern Territory. Differentials in death rates for people aged 65 years or more were generally similar to those for people aged 25 to 64 years (Table 4.10), except for Queensland where rates for older people were 4 per cent below the national average, and the Northern Territory where rates for females were 24 per cent above the average.

Disability prevalence rates do not vary significantly from the national average, with the exceptions of males aged 65 years or more (18 per cent lower in South Australia) and females aged 65 years or more (10 per cent higher in Victoria).

Queenslanders of both sexes and all ages reported more serious chronic illness than the national average—around 20 to 24 per cent more for children, young adult males and working age adults, 44 per cent more for young adult females and around 15 per cent more for older people. Working age Victorian women reported less serious chronic illness than the national average (Table 4.10), and children in the Australian Capital Territory reported significantly more than the national average (57 per cent for boys and 74 per cent for girls).

Queensland males and females also reported more recent illness than the national average in all age groups, except for those aged 65 years or over, and working age males. Victorian working age adults reported significantly more days of reduced activity, although their experience of recent illness did not differ from the national average (Table 4.10). Queensland adults reported fewer days of reduced activity, and working age males in the Northern Territory reported 170 per cent more days.

Except for boys aged 0 to 14 years, people aged less than 65 years living in metropolitan areas (capital city statistical divisions for the six States and all of the Australian Capital Territory) experienced significantly lower death rates than those living in non-metropolitan areas, but there was no difference for older people (Table 4.11). In contrast, females living in non-metropolitan areas reported less illness and days of reduced activity. The pattern for males was less clear, and there was no consistent pattern for disability.

A more detailed examination of regional differences—comparing rural residents with urban residents, rather than just capital city residents with all other Australians—may well find larger health differentials.

Table 4.10: Health differentials by States and Territories, and sex, age 25–64 years, late 1980s

	Rate ratio[(a)]							
Health status indicator	*NSW*	*Vic*	*Qld*	*WA*	*SA*	*Tas*	*ACT*	*NT*
Males								
Deaths	1.03 *	0.96 *	1.04 *	0.92 *	0.92 *	1.08 *	0.79 *	1.76 *
Disability	1.01	1.00	1.00	1.04	0.92	0.99	0.90	1.22
Serious chronic illness	0.93	0.99	1.20 *	0.98	1.00	0.81	1.19	0.88
Recent illness	1.01	1.01	1.03	0.95	0.93	0.89	0.98	1.19
Reduced activity	0.96 *	1.10 *	0.85 *	0.92 *	1.18 *	1.24 *	0.92	2.70 *
Females								
Deaths	1.05 *	0.96 *	1.01	0.92 *	0.92 *	1.08	0.92	1.88 *
Disability	1.01	1.05	0.88	1.04	0.94	0.95	1.05	1.17
Serious chronic illness	1.00	0.88 *	1.24 *	1.05	0.95	0.85	0.83	0.75
Recent illness	1.03	0.98	1.07 *	0.93	0.97	0.88	0.82	0.65
Reduced activity	0.92 *	1.09 *	0.95 *	1.03	1.06	1.07	1.00	0.99

(a) Ratio of age-standardised rate for State or Territory to that for Australia as a whole. All rates age-standardised to 1988 Australian population.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from 1985–1987 mortality data, ABS 1988 Survey of Disability and Ageing, ABS 1989–90 National Health Survey

Table 4.11: Non-metropolitan / metropolitan health differentials, by age group and sex, late 1980s

	Rate ratio[(a)]			
Health status indicator	*0–14 years*	*15–24 years*	*25–64 years*	*65 years and over*
Males				
Deaths	1.07	1.39 *	1.15 *	1.00
Disability	0.91	1.00	1.22 *	0.97
Serious chronic illness	1.00	0.94	1.04	0.99
Recent illness	0.95	0.83 *	1.00	0.93
Reduced activity	0.78 *	1.01	1.06	1.02
Females				
Deaths	1.14 *	1.41 *	1.09 *	0.99
Disability	1.30	1.14	0.97	0.91 *
Serious chronic illness	0.81 *	0.95	0.98	0.90
Recent illness	0.94	0.81 *	0.95	0.93
Reduced activity	0.88 *	0.90 *	0.80 *	0.83 *

(a) Ratio of age-standardised rate for non-metropolitan residents to that for metropolitan residents. All rates age-standardised to 1988 Australian population.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from 1985–1987 mortality data, ABS 1988 Survey of Disability and Ageing, ABS 1989–90 National Health Survey

Differentials by country of birth

Australian residents born overseas have lower mortality rates than those born in Australia, but their rates rise with length of residence in Australia so that, after around 15 to 20 years, the mortality rates of most groups approximate those of Australian-born people (Young 1986). Of course, migrants are highly selected by health status, both explicitly by health criteria applied by the Australian Government to people seeking to migrate to Australia and also because people who are in poor health are less likely to have the ability and economic resources to migrate.

For nearly all age groups in 1985–1987, Australian residents born overseas (see Box 4.8) had lower mortality than those born in Australia (Figure 4.8). For working

Box 4.8: Country of birth categories

• ***Australia***	
• ***Britain and Ireland***	
• ***Other Europe***	*Includes Eastern Europe and USSR.*
• ***Asia***	*Includes Middle East and North Africa for mortality and disability differentials. Excludes Northeast Asia (China, Hong Kong, Japan, North Korea, South Korea and Taiwan) for illness and reduced activity differentials.*
• ***Other***	*The Americas, Pacific region, rest of Africa. Includes Middle East and North Africa for illness and reduced activity differentials. Includes Northeast Asia for illness and reduced activity differentials.*

Figure 4.8: Mortality differentials by country of birth, age group and sex, 1985–1987

Source: Australian Institute of Health and Welfare

Refer to Appendix 1, Table A43

age males, the lowest death rate was for men born in Asia. For females, working age women born in Asia and in continental Europe had the lowest death rates.

Overseas-born Australians had lower death rates than those born in Australia for all major cause of death groups, but there were some individual causes for which overseas-born people had higher rates. Except for Asian-born males, all overseas-born groups aged 25 to 64 years had higher death rates for stomach cancer than did people born in Australia. Working age people born in the United Kingdom and Ireland had higher death rates from lung cancer than did people born in Australia—20 per cent higher for males, and 40 per cent higher for females. Death rates from motor vehicle traffic accidents were 51 per cent higher for women born in 'Other' countries (New Zealand, Oceania, Africa and the Americas).

Compared with those born in Australia, the prevalence of reported disability was significantly lower for working age males and females born in Asia (Table 4.12). In general, people born overseas reported significantly less serious chronic and recent illness than did those born in Australia. Some of these reported differences may relate to cultural differences in perception and reporting of illness, and in response to illness by reduction of activity.

The gradient of reported morbidity with length of residence in Australia is quite dramatic (Table 4.13). Men and women aged 25 to 64 years who had been in Australia for less than 5 years reported around 40 per cent fewer serious chronic and recent illnesses than did Australian-born men and women. Migrants in this age group with less than 5 years residence in Australia also reported fewer days of reduced activity than did Australian-born people (50 per cent fewer for men and 25 per cent for women). As the period of residence in Australia increased, reported levels of serious chronic and recent illness approached the levels of the Australian-born. A different pattern was seen for reported days of reduced activity. On average, migrants who had been in Australia 10 years or more reported 10 per cent higher levels of reduced activity than did Australian-born men and women.

Table 4.12: Country of birth health differentials[(a)], by sex, age 25–64 years

	Rate ratio[(b)]			
Health status indicator	*UK and Ireland*	*Other Europe*	*Asia*	*Other*
Males				
Deaths	0.86 *	0.78 *	0.66 *	0.90 *
Disability	0.90	0.97	0.60 *	0.70 *
Serious chronic illness	0.90	0.70 *	0.67 *	0.73 *
Recent illness	0.85 *	0.79 *	0.81	0.84 *
Reduced activity	0.85 *	1.07	1.08	1.19 *
Females				
Deaths	0.90 *	0.72 *	0.72 *	0.90 *
Disability	1.13	1.02	0.64 *	1.00
Serious chronic illness	0.99	0.75 *	0.51 *	0.70 *
Recent illness	0.89 *	0.87	0.62 *	0.92
Reduced activity	1.00	1.12	0.58 *	1.23 *

(a) See Box 4.8 for country of birth categories.

(b) Ratio of age-standardised rate to that for persons born in Australia. All rates age-standardised to 1988 Australian population.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from 1985–1987 mortality data, ABS 1988 Survey of Disability and Ageing, ABS 1989–90 National Health Survey

Table 4.13: Health differentials by period of residence in Australia and sex, age 25–64 years, 1989–1990

	Rate ratio[(a)]			
Period of residence	*Deaths*	*Serious chronic illness*	*Recent illness*	*Reduced activity*
Males				
Australian born	1.00	1.00	1.00	1.00
10 years and over	0.71 *	0.84 *	0.88 *	1.11 *
5–9 years	0.51 *	0.66 *	0.72 *	0.77 *
0–4 years	0.89 *	0.66	0.63 *	0.50 *
Females				
Australian born	1.00	1.00	1.00	1.00
10 years and over	0.73 *	0.87 *	0.94	1.12 *
5–9 years	0.56 *	0.69	0.79 *	0.97
0–4 years	0.70 *	0.46 *	0.64 *	0.75 *

(a) Ratio of age-standardised rate to that for persons born in Australia. All rates age-standardised to 1988 Australian population.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from 1985–1987 mortality data, ABS 1989–90 National Health Survey

Thus, death rates and levels of reported disability, illness and reduced activity due to illness are generally lower among overseas-born Australians than among Australian-born people. However, there is some evidence that particular diseases are more prevalent among persons born overseas (Donovan et al. 1992).

Sample size restrictions of the 1989–90 NHS precluded a more detailed examination of health differentials for people born in individual overseas countries. The grouping used here of people from a number of different birthplaces may conceal health differences between specific migrant groups. It is also possible that self-reporting does not provide an accurate representation of the health experience of non-English-speaking migrants. People who did not speak English at home, when compared with those who did, reported fewer chronic illnesses, but were much more likely to report their health as fair or poor. It may be that non-English-speaking people had more difficulties in reporting specific illnesses than English-speaking people.

It is very difficult from the data sources to disentangle the combined influences of migration, cultural factors, health selection, occupational status and socioeconomic status on the health of migrant groups in Australia. For example, it is very likely that the lower mortality of many overseas-born people is due to health selection effects upon migration, combined with factors such as a healthier diet for some groups. These factors may conceal adverse health effects associated with work, or with poorer socioeconomic status in Australia.

Consistency of Australian and overseas evidence on health inequalities

There is evidence of health differentials according to socioeconomic status in most developed countries (Wilkinson 1989; Fox, Carr-Hill 1989).

In Britain, differences in mortality were initially mainly demonstrated for adult males based on social class (grouped according to five classes based on the Registrar-General's classification of occupations) (Brotherston 1976). These differentials attracted considerable attention with the release in 1980 of the report of the Working Group on Inequalities in Health (known as the Black Report) (Townsend, Davidson 1982), which found that between 1931 and 1970–1972 there had been a widening of social class mortality differentials for working age males. These British findings have been since confirmed by others (see, for example, Whitehead 1988; Davey Smith, Bartley, Blane 1990; Fox, Goldblatt, Jones 1990), who found:

- socioeconomic differences in mortality for males and females using housing tenure, car ownership and employment grade in the civil service as different measures of socioeconomic status
- mortality differences according to employment status, with unemployed males having higher mortality rates than employed males.

Differentials in mortality by education level have also been demonstrated in the United States (Feldman et al. 1989), and by occupation, education and area socioeconomic disadvantage in European countries (Valkonen 1989; Leclerc 1989). These differentials are present for most major causes of death, including diseases of the circulatory system, chronic respiratory disorders, injuries and many cancers.

Australian morbidity differentials reported here are consistent with overseas evidence. There are:

- stronger socioeconomic differentials for chronic illness than for acute illness, particularly for disabling chronic illness and for chronic mental illness (Townsend, Davidson 1982; Blaxter 1989)
- stronger socioeconomic differences according to income rather than according to occupation, with especially large differences between the health of employed and unemployed people (Blaxter 1990)
- greater differentials by income in the experience of ill-health in the middle years of life (Blaxter 1990).

Overseas research also demonstrates that people of lower socioeconomic status have greater exposure to health risk factors, especially a higher prevalence of smoking and less exercise (for Australian evidence, see 'Sociodemographic differentials in risk factors', page 226). The relationship between socioeconomic status and diet and excess alcohol intake is not clear. Dietary differences have not been investigated extensively in Australia, but research in Britain found that people in non-manual occupational groupings consumed more fibre, fruit and polyunsaturated fats than did those in the manual occupational groupings (Blaxter 1990).

However, overseas research demonstrates that there are still socioeconomic gradients in mortality and morbidity even after the adverse risk factors of lower socioeconomic groups are taken into account (Marmot, Shipley, Rose 1984; Blaxter 1990).

Trends in health differentials

All the health differentials reported here are from cross-sectional surveys, or from health data for a given period of time. The Institute plans to analyse for changes over time the three national health surveys which have been conducted to date by the ABS (1977–1978, 1983 and 1989–1990).

For the moment, the trends in specific diseases provide some evidence about differentials. For example, the decline between 1969 and 1978 in ischemic heart disease mortality of Australian males was substantially greater for professional than for blue-collar workers (Dobson et al. 1985). This difference may be related to the widening differential between professional and blue-collar workers in the prevalence of tobacco smoking (Hill, White, Gray 1988) and/or in participation in vigorous physical activity (Bauman 1987). It may also reflect the lesser impact of health promotion messages among socioeconomically disadvantaged groups (Health Targets and Implementation Committee 1988).

Assessment of trends in differentials needs to be undertaken with caution, as there are potential problems with changes in the composition of the population groups being compared. However, there is a growing volume of evidence that health differentials in some countries are widening (Delamothe 1991; Valkonen 1989; Mackenbach, Stronks, Looman 1989; Feldman et al. 1989).

The trend in Britain is clear—the death rates of those in the two highest social classes have declined relatively more than those in the lowest class—and methodological problems are unlikely to explain more than one-sixth of these changes (Wilkinson 1986).

In reviewing these trends in Britain, a recent editorial in the *British Medical Journal* commented that health differentials had increased alongside a widening differential in income distribution (Smith 1990). Although the social causes of ill-health are not well understood, the differences in health status in Britain had become more striking as the poverty gap widened.

Explanations for health differentials

Health differentials can be considered in relation to specific conditions and risk factors (for example, death rates from lung cancer or prevalence of smoking) or in relation to general patterns of health. It is important to study the reasons for condition-specific health outcomes, but the consistency of differentials of mortality, disability and morbidity, in Australia and overseas, suggests that there are general explanations for these patterns.

As previewed in Section 1.4 (page 18), these general explanations may be grouped under five headings:

- *artefactual*—documented health differentials are an artefact of the way the research has been conducted, particularly the classification systems used to measure socioeconomic differences
- *social selection*—differences in biology or heredity result in selection into different socioeconomic strata according to health status (of an individual or his/her parents)
- *cultural/behavioural*—the differentials reflect the more unhealthy behaviour (lifestyle) of lower socioeconomic groups
- *structural*—the differentials result from the impact on certain groups of an adverse social and economic environment, such as poor working conditions or relatively low levels of economic resources, which reflect the way society is structured
- *differences in access to health services.*

Artefactual explanation

According to this explanation, documented health differentials are largely a product of the methods used to derive the statistics. As noted in 'Socioeconomic differentials' (page 180), there are considerable problems in the estimation of death rates for occupational groups using data derived from death registration and population censuses, particularly for the examination of trends. However, British studies which have avoided these problems found the same general patterns of differentials (Fox, Goldblatt, Jones 1990).

Concerns also arise about the validity of self-reported data on health and illness. There certainly are problems with the use of self-reported health status in the analysis of differentials, since perceived norms may vary by age, sex, education, socioeconomic status or health experience. On the other hand, self-reporting of symptoms has been found to be correlated with doctors' assessments (Blaxter 1990), and self-reported global health (as poor through to excellent) is a good predictor of mortality (Mossey, Shapiro 1982; Idler, Kasle, Lemke 1990). As well, the remarkably steep and regular gradient of differentials by virtually any measure of socioeconomic status suggest the differentials are real.

Social selection and selective mobility

The second major class of general explanations for health differentials relate to social mobility. These explanations suggest that less healthy people move down the socioeconomic scale and/or healthier people are more likely to move up the scale. Selection effects are likely to be a factor in explaining the very much poorer health of working age males outside the labourforce (see 'Socioeconomic differentials', page 180), and may also contribute to the poorer health status of unmarried adults and unemployed persons.

British studies have demonstrated that poorer health can influence socioeconomic status (Wadsworth 1986; Illsley 1986), but others have found that there is still a strong correlation between ill-health and socioeconomic status after taking account of the effects of social selection (Blaxter 1990; Fox, Goldblatt, Jones 1990). The steadily rising differentials in mortality between unemployed and employed people who are followed over time, suggest there are additional adverse health effects associated with unemployment (see 'Socioeconomic differentials', page 180).

In summary, selective mobility may be important at some life stages and in certain groups, but it is not thought to be a major cause of the health differentials between socioeconomic groups (Fox, Goldblatt, Jones 1990; Wilkinson 1986; Power, Manor, Fox 1991).

Behavioural lifestyle influences

Behavioural explanations seek to explain the lower health status of lower socioeconomic groups in terms of the adverse lifestyles of members of these groups. That is, such explanations 'focus on the individual ... emphasising unthinking, reckless or irresponsible behaviour or incautious lifestyle as the moving determinant of poor health status' (Townsend, Davidson 1982:119).

It is true that the rates of a number of behavioural lifestyle factors (such as smoking) are higher for lower socioeconomic groups (see 'Sociodemographic differentials in risk factors', page 226), but the factors contributing to these differences are not clear. More importantly, lifestyle differences do not appear to be the major reason for socioeconomic differentials in health. In Britain, adjustment for lifestyle differences reduced social class mortality gradients by only a quarter (Marmot, Shipley, Rose 1984). Other work in Britain found that social circumstances affected behaviour, but that the effect was not simple: 'If circumstances are good, "healthy" behaviour appears to have a strong influence upon health. If they are bad, then behaviour made rather little difference' (Blaxter 1990:216). This suggests that lifestyle and structural factors are interwoven. Socioeconomically disadvantaged people may be constrained in the choices they can make to engage in a healthy lifestyle. These constraints may be economic and/or cultural, and they may relate to the need to compensate for and cope with a difficult, unrewarding or stressful life. In addition, their choices may be limited by lack of knowledge. Lack of knowledge is influenced not only by level of education, itself possibly a result of structural factors, but also by a person's capacity (including economic capacity) to participate in the range of activities and institutions in a community through which much information and knowledge is generated and shared.

Structural factors

Structural explanations for health differentials attribute most of the differentials to the social structure governing the distribution of resources in society. Aspects of social circumstances which could cause health differentials are:

- the level of economic resources, which will affect capacity to purchase goods and services and to participate in social activities
- the living environment, including the quality of housing and of the local physical environment
- the working environment, including the type of work undertaken and working conditions
- social support.

Difference in access to economic resources is most usually measured by difference in income. Many researchers have concluded that difference in income is one of the most critical factors behind health differentials:

- income and social support were the two key factors explaining differences in health in a lifestyle survey (Blaxter 1990)
- being in a large or one parent family, and being in a family with low income and poor housing, were the two criteria that consistently selected disadvantaged children from other children (Blaxter 1986)
- income was most significantly correlated with health differentials among Australians (National Health Strategy 1992)
- international comparisons show a close association between income and mortality differentials (Wilkinson 1990, 1992).

Low income can contribute to health differentials directly through inability to purchase goods and services that influence health (such as adequate nutrition and good quality housing) or indirectly through reduced participation in society.

The direct effect is likely to be most important in childhood. Childhood deprivation is frequently mentioned as a key factor in contributing to health differentials in adults, as well as children (Lundberg 1991; Marmot 1986). There is evidence for an association between social and economic circumstances in early childhood, and differences in adult death rates from coronary heart disease and some respiratory disorders (Shiell 1991). A considerable part of the health differentials found in a large sample of young British adults were explained by childhood circumstances, including factors relating to 'inheritance at birth', childhood socioeconomic characteristics and educational achievement (Power, Manor, Fox 1991).

Differences in physical living environments (such as in housing quality, water supply, air pollution and hazardous industrial and commercial waste) contribute to health differentials. In Australia, poor physical environments contribute to the poor health status of Aboriginal people, but there is less evidence about the environmental contribution to health differentials among other Australians. Analyses conducted by the Australian Institute of Health and Welfare for the National Health Strategy (1992) found that the self-reported health of people who lived in socioeconomically deprived areas in Australia was significantly worse than that of other Australians, even after adjusting for individual differences in income, education level, employment status and other social factors.

Some authors have argued that the working environment is a prime source of socioeconomic differentials in health, acting through differences in the characteristics of the labour process and in the environment itself (Lundberg 1991). It is extremely difficult to disentangle such effects from the associated income differences.

Data from the 1989–90 NHS suggest that occupational differences in reported illness rates are reduced after controlling for income, education and area of socioeconomic disadvantage, but that significant health differentials remain (National Health Strategy 1992).

Low income can also influence health through its effects on people who cannot afford to participate fully in the normal activities of their community. It is believed to be an important aspect in developed countries—a person's income may be enough to maintain a basic standard of living, but low income can have important marginalising effects influencing health (Wilkinson 1990).

Differences in social support are also believed to contribute to health differentials between various groups (Marmot 1986; Blaxter 1990), but there have been very few Australian studies. Such factors could contribute to the differences in health between married and unmarried people.

Psychosocial mechanisms are increasingly regarded as being important to the relationship between social circumstances and health differentials—through the marginalising effects of low income and unemployment, the nature of work organisation, and the lack of social support (National Health Strategy 1992). These mechanisms may also contribute to the persistence of socioeconomic gradients across different causes of death and disease and over time, despite changes in the incidence of disease.

Access to health care

Australian evidence (McClelland 1991b; National Health Strategy 1992) and overseas studies (O'Donnell et al. 1991; Macintyre 1989) show the following consistent findings:

- lower socioeconomic groups use more health services (such as medical and hospital services) but their use is not necessarily greater when their poorer health is taken into account
- lower socioeconomic groups are more likely to delay seeking treatment and use fewer preventive, early intervention and screening services, and fewer rehabilitation and after-care services
- the cost of services can be a greater deterrent to the use of services by lower socioeconomic groups.

With the possible exception of preventive and early intervention services, the contribution of the health care system to health differentials is regarded as much less important than the influence of social circumstances and lifestyle factors (National Health Strategy 1992).

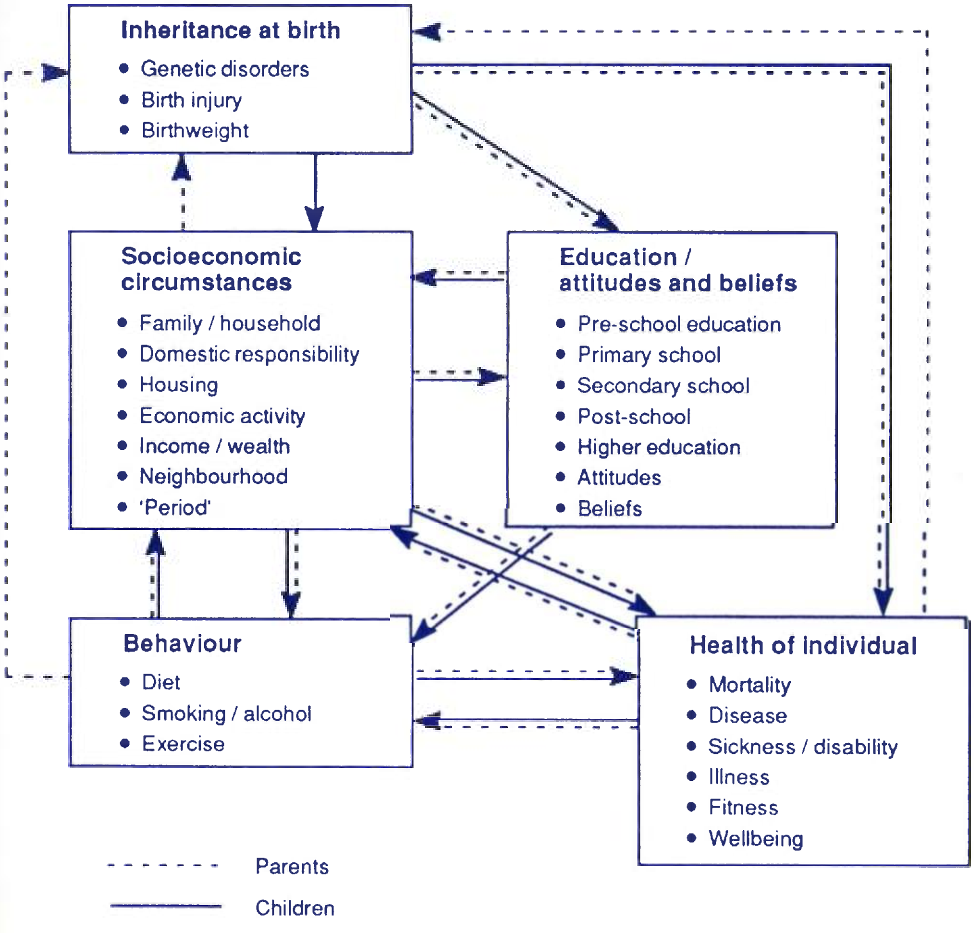
Summary and conclusions

Following the release in 1980 of the Black Report, the debate on health differentials has focused largely on general explanations for the differentials, particularly on the contributions of lifestyle and structural factors. There has been an increasing emphasis on individual circumstances and the inter-relationship between these and social structures. These interrelationships have been conceptualised by British researchers (Power, Manor, Fox 1991) in a framework which also takes account of inter- and intra-generational pathways (Figure 4.9). Such a framework should assist in the longitudinal studies which are essential to disentangle and understand the causal pathways.

Evidence from Australia and overseas suggests that:

- socioeconomic differentials in health are real
- health selection effects are important at some stages of the life cycle and in relation to some aspects of health, but do not explain most of the observed differences between population groups
- the process by which socioeconomic status and behaviour and lifestyle influence health is a complex one
- individual behaviour has important social dimensions, and variations in the behaviour of groups only partly explains socioeconomic differentials in health
- health outcomes are a result mainly of the interaction of structural and behavioural processes, with selection making a small contribution, all taking place within the context of changing social and economic structures

Figure 4.9: Inter- and intra-generational relationships between health and circumstances



Source: Power, Manor, Fox 1991

- the specific aspects of social environments that cause differentials in health are not well understood, but income, working environment and social support are likely to be important factors
- childhood circumstances, particularly educational factors, play an important role in the production of adult health differentials
- differential access to health care is not thought likely to be a major cause of health differentials in Australia, but differential use of early intervention and preventive care may be important for specific diseases.

In summary, it is important to analyse disease-specific reasons for health differentials, particularly in relation to improving prevention activities and improving access to specific health services, but the consistency of socioeconomic gradients in health over time and across different causes of death and disease indicates the importance of general underlying factors in the determination of health differentials.

The complexity of the problem should not deter attempts to reduce health differentials, as many of the underlying factors are amenable to change. Achievement of greater equity in health requires committed interventions addressing these underlying factors.

4.2 Australian Aboriginal and Torres Strait Islander health differentials

As noted in Section 4.1, the main data sources used in examining health differentials in the total Australian population do not identify Australian Aborigines and Torres Strait Islanders with sufficient completeness to permit a similar comparison of the health of Aborigines (taken here to include both Australian Aborigines and Torres Strait Islanders) with that of other Australians. However, available data on mortality (including infant mortality) and hospitalisation confirm that Aborigines remain the least healthy identifiable sub-population in Australia.

This section summarises statistics collated and analysed from data supplied to the Institute by the New South Wales, Queensland, Western Australian, South Australian and Northern Territory health authorities, and from published sources. No attempt is made in this report to present details of the Aboriginal population and general morbidity (for more detail, see AIH 1988; Thomson 1991), but Section 4.3 presents some evidence of the dental health status of Aboriginal children.

Mortality

Death rates

National information about Aboriginal mortality is not available. For all regions for which data are available, death rates (after age-standardisation) are at least two-and-a-half times those of the total Australian population (Figure 4.10). Overall, death rate for Aboriginal males is 3.1 times that of the total Australian male population. For Aboriginal females, it is 3.2 times that of the total female population.

A striking difference between Aboriginal and total Australian death rates is the very much higher mortality experienced by young and middle aged adults (Figure 4.11). For males, the peak difference occurs for the 35 to 44 year age group, with Aboriginal males dying at a rate more than 11 times that of the total male population.

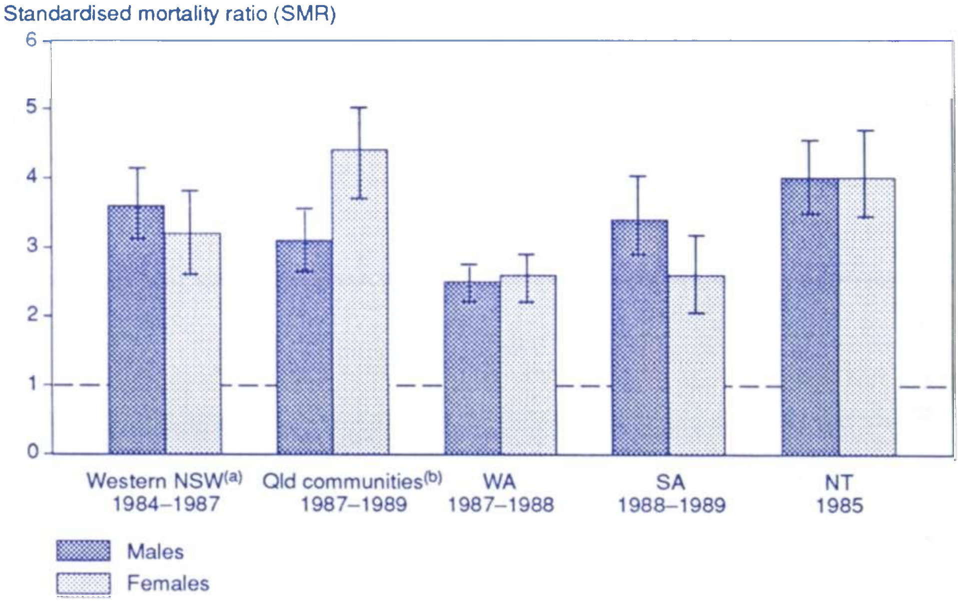
For Aboriginal females aged 35 to 44 years and 45 to 54 years, death rates are around nine times those of the total female population.

Expectation of life

Reflecting these higher death rates, the expectation at life at birth remains much lower for Aborigines than for the total Australian population (Figure 4.12). From the available data, the overall expectation of life at birth is 55.2 years for Aboriginal males, and 63.6 years for Aboriginal females. These expectations are some 15 to 17 years less than those for the total Australian population in 1986 (the most comparable year for the available Aboriginal data)—72.9 years for males, and 79.2 years for females.

Overall, only a third of Aboriginal males could expect to live to their 65th birthday, compared with more than three-quarters of all Australian males. About a half of Aboriginal females could expect to live to 65 years, compared with nearly nine out of ten of all Australian females.

Figure 4.10: Aboriginal standardised mortality ratios[a], by sex and selected regions, late 1980s



(a) The vertical lines indicate the 95 per cent confidence range for each SMR. The SMRs have been estimated using the age-specific death rates for the 1986 Australian populations.

(b) See Glossary for details.

Sources: Thomson, Briscoe 1991a, b, c, d, e
Gray, Hogg 1989

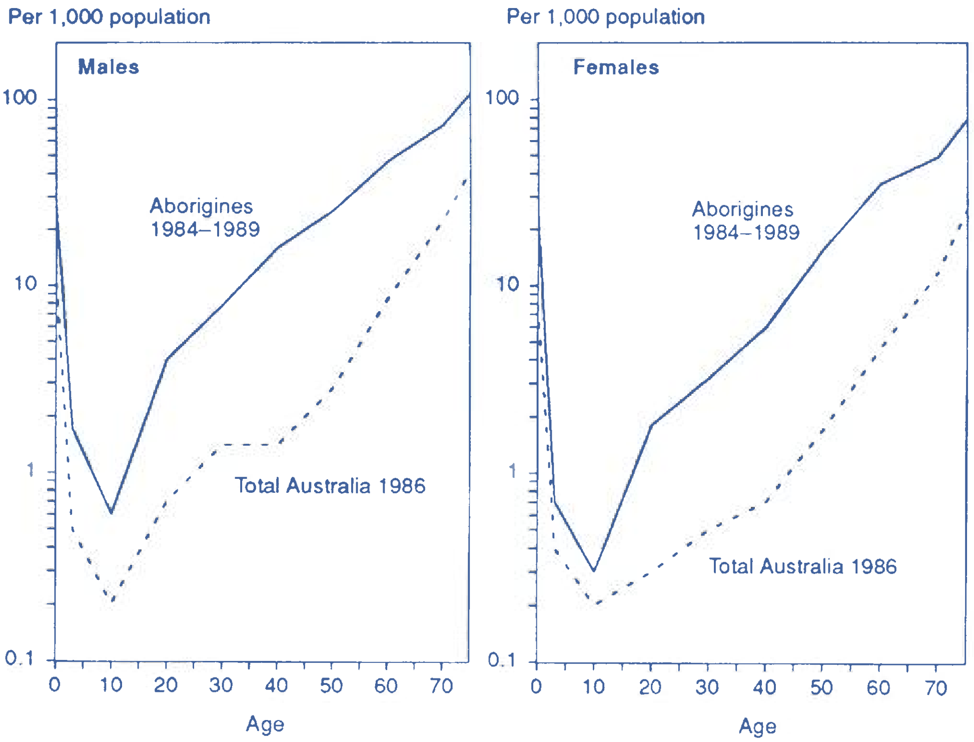
Refer to Appendix 1, Table A45

Causes of death

As with total death rates, the rates for specific causes of Aboriginal deaths vary around the country. Overall, the ICD category ***Diseases of the circulatory system*** (including heart disease and strokes) is the leading cause of death for Aboriginal males and females, as it is for the total Australian populations (Figure 4.13). Aboriginal death rates for this group of causes were 2.7 times higher than the rate expected for males and 2.5 times higher than that expected for females if the overall Australian rates applied to the Aboriginal population. ***Diseases of the circulatory system*** accounted for 30 per cent of the excess mortality experienced by Aboriginal males, and for 24 per cent of that experienced by Aboriginal females.

Deaths from circulatory system disease were predominantly caused by degenerative conditions such as ischemic heart disease and cerebrovascular disease. However, a number of deaths of Aborigines living in the more remote areas of Australia were attributed to acute rheumatic fever and chronic rheumatic heart disease, which are very uncommon causes of death for other Australians.

Figure 4.11: Age-specific death rates by sex, Aborigines 1984–1989[(a)] and total Australian population 1986



(a) The Aboriginal figures relate to western New South Wales (1984–1987), the Queensland communities (1987–1989), Western Australia (1987–1988), South Australia (1988–1989) and the Northern Territory (1985).

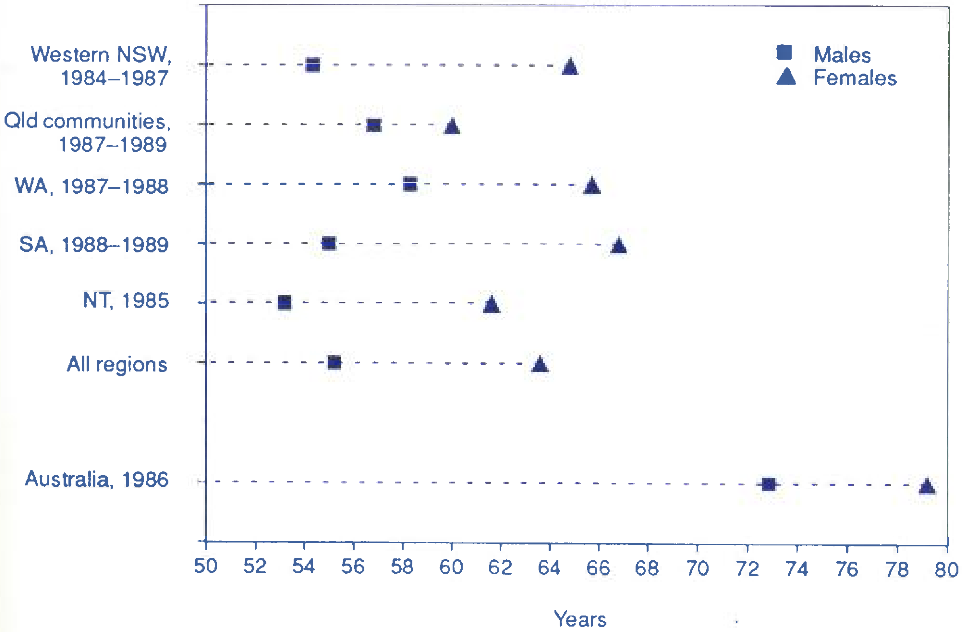
Source: Australian Institute of Health and Welfare *Refer to Appendix 1, Table A46*

The second most frequent causes of death for Aboriginal males and females were conditions classified under ***External causes of injury and poisoning*** (this group includes motor vehicle and other accidents, suicide and self-inflicted injury, and homicide and injury purposely inflicted by others). For Aboriginal males, the death rate was 3.5 times that expected from overall Australian rates, and deaths from causes in this group were responsible for 20 per cent of the excess mortality experienced. For Aboriginal females, the death rate was 3.8 times that expected, and deaths from causes in this group were responsible for 13 per cent of the excess mortality.

Diseases of the respiratory system was the third most frequent cause of death for Aboriginal males. The rate was 5.0 times that expected, and these diseases were responsible for 13 per cent of the excess mortality experienced by Aboriginal males. Although occurring at a rate 7.4 times that expected, and contributing 14 per cent of the excess mortality, deaths from respiratory disease were only the fourth most frequent cause of death for Aboriginal females.

Neoplasms (cancers) was the third most frequent cause of death for Aboriginal females. The rate was 1.5 times that expected, and these diseases were responsible for 6 per cent of the excess mortality experienced by Aboriginal females. For Aboriginal males, cancers were the fourth most frequent cause of death, with a rate 1.3 times that expected. Cancers were responsible for only 3 per cent of the excess mortality experienced by Aboriginal males.

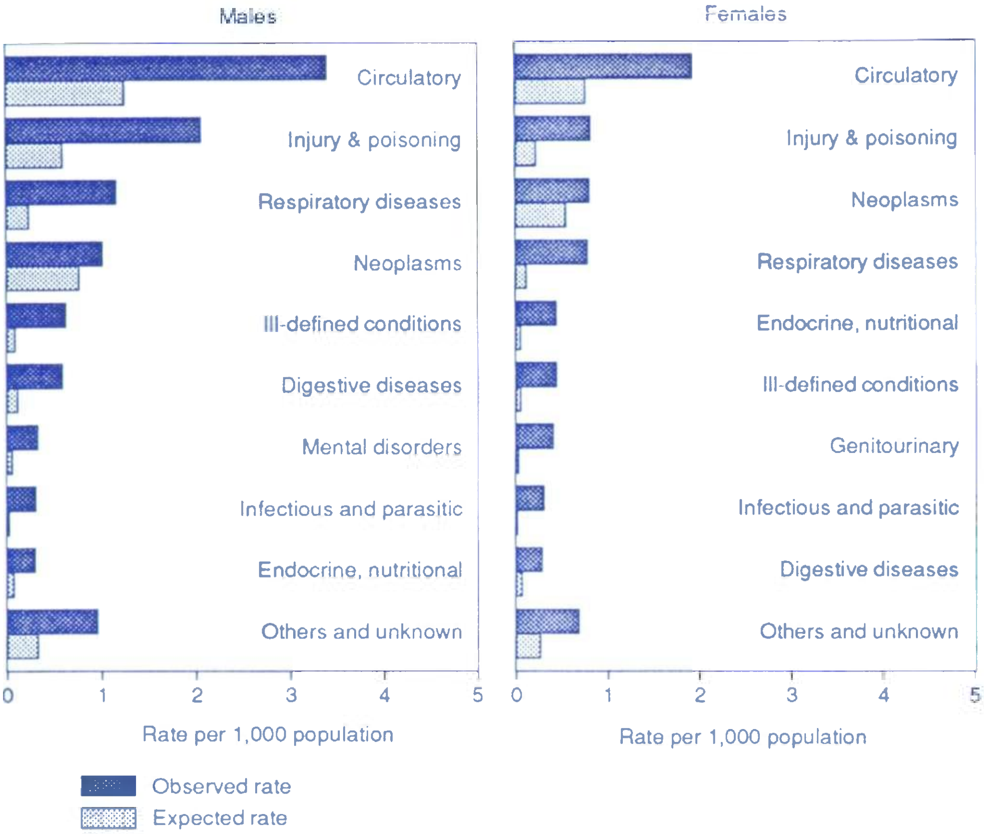
Figure 4.12: **Expectation of life at birth by sex, Aborigines 1984–1989 and total Australian population 1986**



Sources: Thomson, Briscoe 1991a, b, c, d, e
Gray, Hogg 1989
Australian Institute of Health and Welfare

Refer to Appendix 1, Table A47

Figure 4.13: Aboriginal deaths[a] by cause and sex, observed and expected rates, 1984–1989



(a) The Aboriginal figures relate to western New South Wales (1984–1987), the Queensland communities (1987–1989), Western Australia (1987–1988), South Australia (1988–1989) and the Northern Territory (1985).

Source: Australian Institute of Health and Welfare

Refer to Appendix 1, Table A48

Infant and fetal mortality

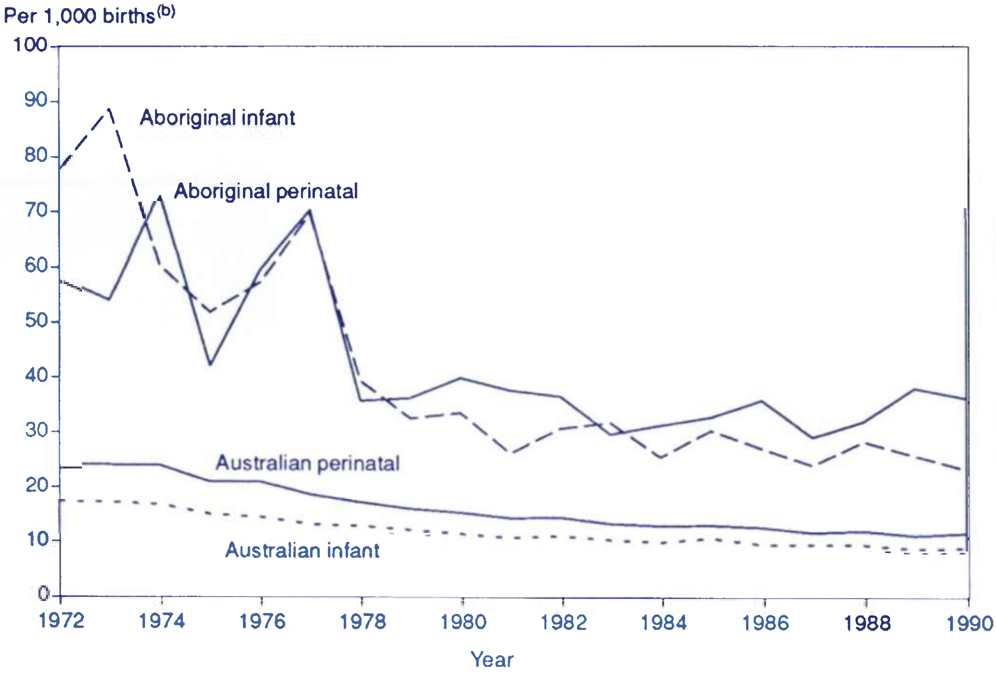
For the period 1988–1990, the Aboriginal infant mortality rate was 24.6 infant deaths per 1,000 live births—3.0 times the rate of 8.3 per 1,000 for the total Australian population. Since the late 1970s, the Aboriginal rate has declined slightly (from 29.9 in 1979–1981), but more slowly than the total Australian rate (Figure 4.14). As a result, the ratio of the Aboriginal to the total Australian rate increased from 2.8 in 1979–1981 to 3.0 in 1988–1990, after having declined from 4.6 in 1972–1974. The substantial rate of reduction in Aboriginal infant mortality achieved in the 1970s was not sustained during the 1980s.

The other useful indicator of fetal and infant survival is the perinatal mortality rate, which is the number of fetal deaths or stillbirths (death of a fetus of at least 500 grams or, if weight is not known, of at least 22 weeks gestation) and neonatal deaths (deaths of live born infants within the first 28 days of life) per 1,000 total births (live births plus fetal deaths). Some caution needs to be used in comparing the figures quoted here with international figures, some of which relate only to fetal deaths and the deaths of live born infants within the first 7 days of life.

For the period 1988–1990, the Aboriginal perinatal mortality rate was 30.3 per 1,000—2.8 times the rate of 10.8 per 1,000 for the total Australian population (Figure 4.14). Like the infant mortality rate, the Aboriginal perinatal mortality rate declined slightly during the 1980s (from 37.2 in 1979–1981), and the ratio of the Aboriginal to the total Australian rate increased to the current level from 2.6 in 1979–1981. During the 1970s, the Aboriginal perinatal mortality rate declined at much the same rate as the total Australian rate.

In contrast to the overall mortality of Aborigines, which shows a remarkable similarity across the country, there are considerable differences between the States and the Northern Territory in Aboriginal perinatal and infant mortality. This largely reflects the substantially higher fetal and infant death rates for Aborigines living in the more remote parts of Australia than for those living in less remote areas (AIH 1988). The aggregated data conceal inter- and intrastate differences.

Figure 4.14: Infant and perinatal mortality rates, Aborigines[(a)] and total Australian population, 1972–1990



(a) The Aboriginal figures relate to the Queensland communities (1972–1990), Western Australia (1978–1990), South Australia (1985–1990) and the Northern Territory (1972–1990).

(b) Infant mortality rate—per 1,000 live births; perinatal mortality rate—per 1,000 total births.

Source: Australian Institute of Health and Welfare

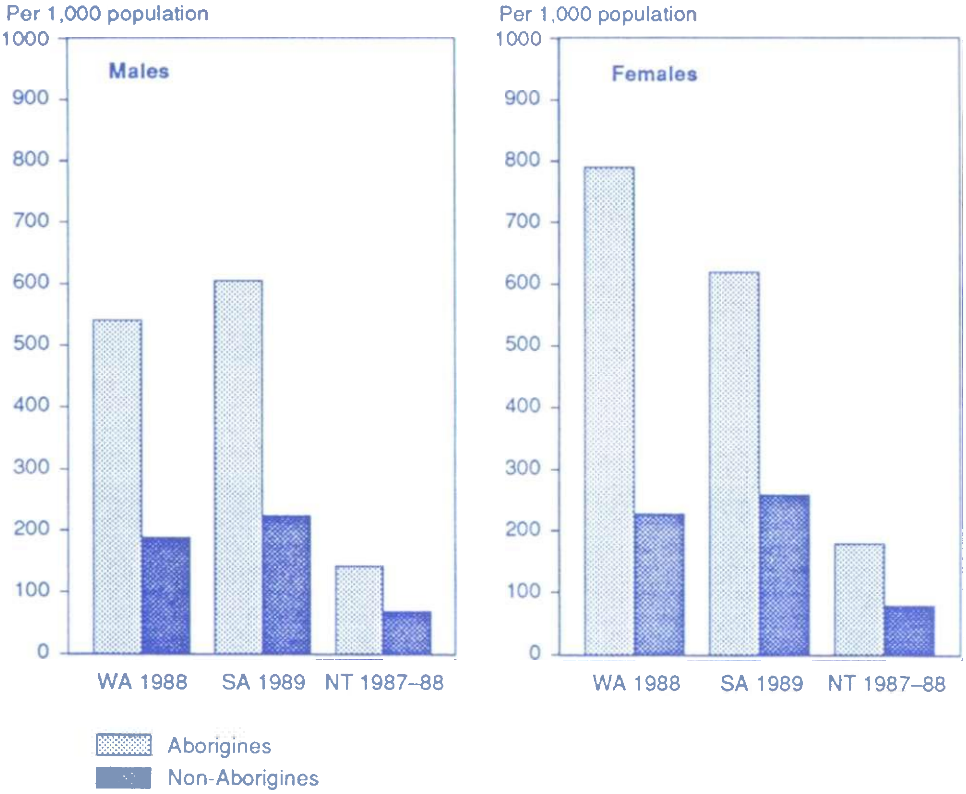
Refer to Appendix 1, Table A49

For Aborigines living in the Northern Territory in 1988–1990, the infant mortality rate was 31.8 infant deaths per 1,000 live births. From the data available for 1988–1990, the lowest reported infant mortality rate was 15.6 per 1,000 for Aborigines living in the Queensland communities. This was lower than the rates for Western Australia (22.3) and South Australia (23.2). Interestingly, the perinatal mortality rate for Aborigines living in Western Australia in 1988–1990 (17.6 perinatal deaths per 1,000 total births) was much lower than for those living in the Queensland communities (26.9), in South Australia (38.8) and in the Northern Territory (44.4).

Hospitalisation

Currently, reliable hospitalisation data for Aborigines are only available for Western Australia, South Australia and the Northern Territory. There are substantial differences in hospital admission rates between these jurisdictions, but for each jurisdiction standardised admission rates are much higher for Aborigines than for non-Aborigines (Figure 4.15).

Figure 4.15: Standardised hospital admission rates by sex and selected region, Aborigines and non-Aborigines, late 1980s



Source: Australian Institute of Health and Welfare

Refer to Appendix 1, Table A50

In order to simplify comparisons between Aboriginal and non-Aboriginal hospitalisation, the following material relates to the combined data for Western Australia (1988), South Australia (1989) and the Northern Territory (1987–88). The World Standard Population has been used as the reference population to adjust for differences in the age structures of the Aboriginal and non-Aboriginal populations.

Admission rates

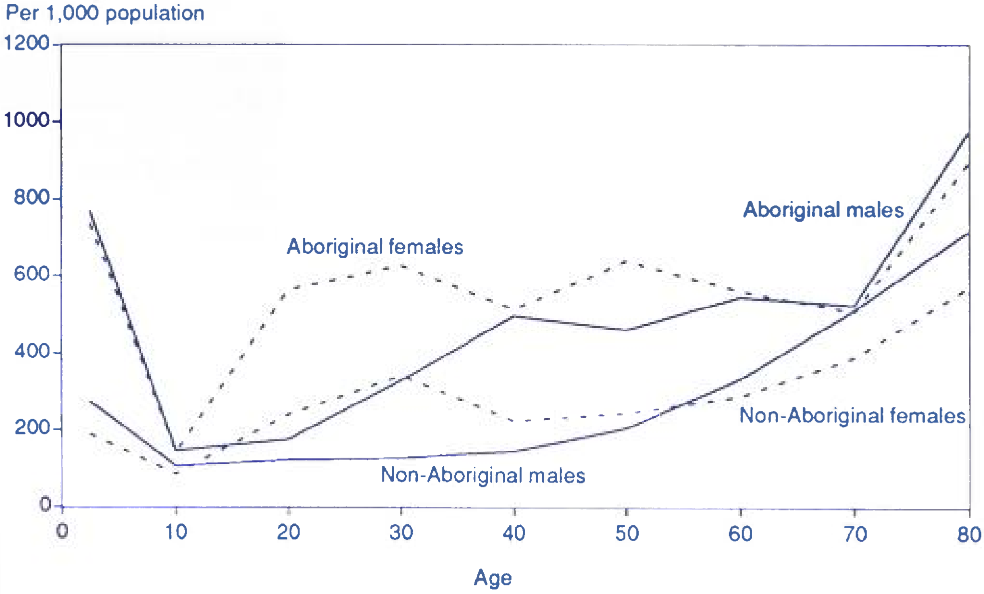
For Aboriginal males, the standardised admission rate of 394 per 1,000 population was twice that of 198 per 1,000 for non-Aboriginal males. For females, the Aboriginal rate of 517 per 1,000 was 2.2 times that of 235 per 1,000 for non-Aborigines.

Admission rates for Aborigines were higher than those for non-Aborigines for all age groups (Figure 4.16), with the highest rate ratios being for infants and young children, and for young and middle aged adults (age group 25–49 years for males, and 15–54 years for females).

Causes of hospitalisation

Diseases of the respiratory system was the leading cause of hospitalisation for Aboriginal males, and the third most frequent cause for Aboriginal females (Figure 4.17). For Aboriginal males, the standardised admission rate for ***Diseases of the respiratory system*** was 2.9 times that for non-Aboriginal males. For females, the Aboriginal rate was 3.4 times that for non-Aborigines. Infants and young children (0–4 year age group) were responsible for almost half of the admissions.

Figure 4.16: Age-specific hospital admission rates by sex, Aborigines and non-Aborigines[a], late 1980s



(a) Figures for both Aborigines and non-Aborigines represent the combined data for Western Australia (1988), South Australia (1989) and the Northern Territory (1987–88).

Source: Australian Institute of Health and Welfare *Refer to Appendix 1, Table A51*

For Aboriginal females, the highest number of episodes of hospitalisation was assigned to the ICD ***Supplementary classification*** (this group includes normal pregnancies and the supervision of high risk pregnancies, as well as a variety of conditions not classifiable to the specific ICD groups). The second highest number was due to conditions in the ICD category ***Complications of pregnancy, childbirth and the puerperium***.

Conditions classified in the ICD group ***Injury and poisoning*** were much more frequent causes of hospitalisation for Aborigines than for non-Aborigines. For Aboriginal males, the standardised admission rate for this group was 2.5 times that for non-Aboriginal males. For females, the Aboriginal rate was 3.6 times that for non-Aborigines.

4.3 Differentials in dental health

The two major dental problems, tooth loss and experience of dental caries or its consequences, are known to be distributed disproportionately among socioeconomic groups. However, Australian data describing socioeconomic differentials in dental health status have been confined generally to regional surveys. The 1987–88 National Oral Health Survey was the first representative oral health survey covering the whole country.

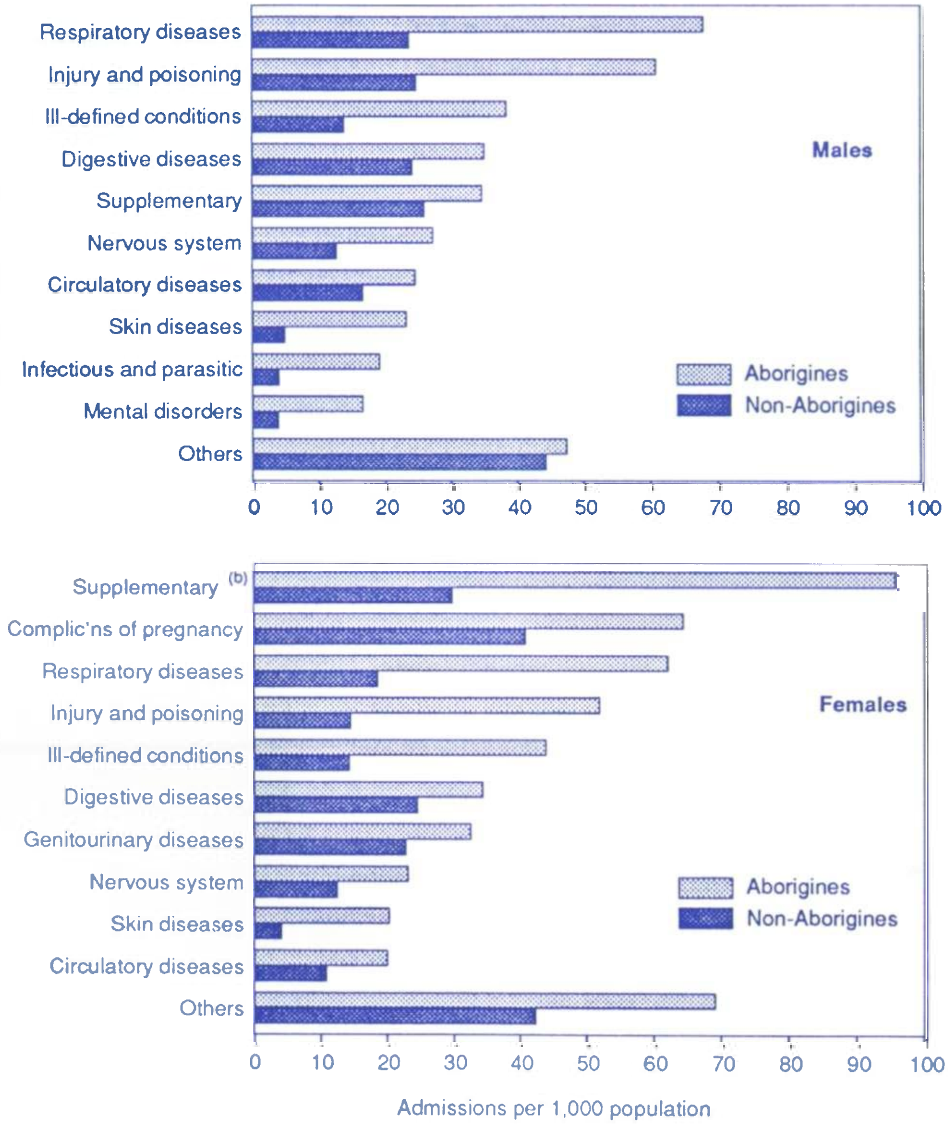
Evidence from the National Oral Health Survey

Although only limited personal information was collected from the 16,897 people interviewed and 14,430 dentally examined in the National Oral Health Survey, the residence of all people was recorded by Census Collection Districts (CD). This allowed the aggregation of dental health status data for each CD and linkage with the ABS Socioeconomic Indexes For Areas (SEIFA) data from the 1986 Census, which provides several indexes of socioeconomic differentials (ABS 1990b). To examine the relationship between socioeconomic status and dental health status, the Index of Education and Occupation, which draws on 25 characteristics of CDs (see Box 4.9), was aggregated into four quartiles and matched with aggregate dental health data.

The dental health status measures examined were edentulism, and decayed, missing and filled teeth, from which the DMFT index was calculated (see Box 2.5, page 57). Before analysis by education and occupation quartiles, each measure was adjusted to remove the effects of sex, country of birth and metropolitan/non-metropolitan residence.

Comparisons of edentulism by age group and education and occupation quartiles are expressed as standardised edentulism ratios (SERs), which were calculated using an indirect standardisation procedure (with a population standard of 100). By Index of Education and Occupation, there is a wide gradient in edentulism in the middle adult ages (Figure 4.18). In the 45 to 54 year age group, the SER of the lowest quartile was 226 (or about two and a quarter times the overall rate), while for the highest quartile the SER was 79 (somewhat less than the overall rate). For the youngest age group, the gradient was almost non-existent, and it was also comparatively narrow for people aged 65 years or older.

Figure 4.17: Standardised hospital admissions by sex and cause, Aborigines and non-Aborigines[(a)], late 1980s



(a) Figures for both Aborigines and non-Aborigines represent the combined data for Western Australia (1988), South Australia (1989), and the Northern Territory (1987–88).

(b) Includes admissions for uncomplicated pregnancies.

Source: Australian Institute of Health and Welfare *Refer to Appendix 1, Table A52*

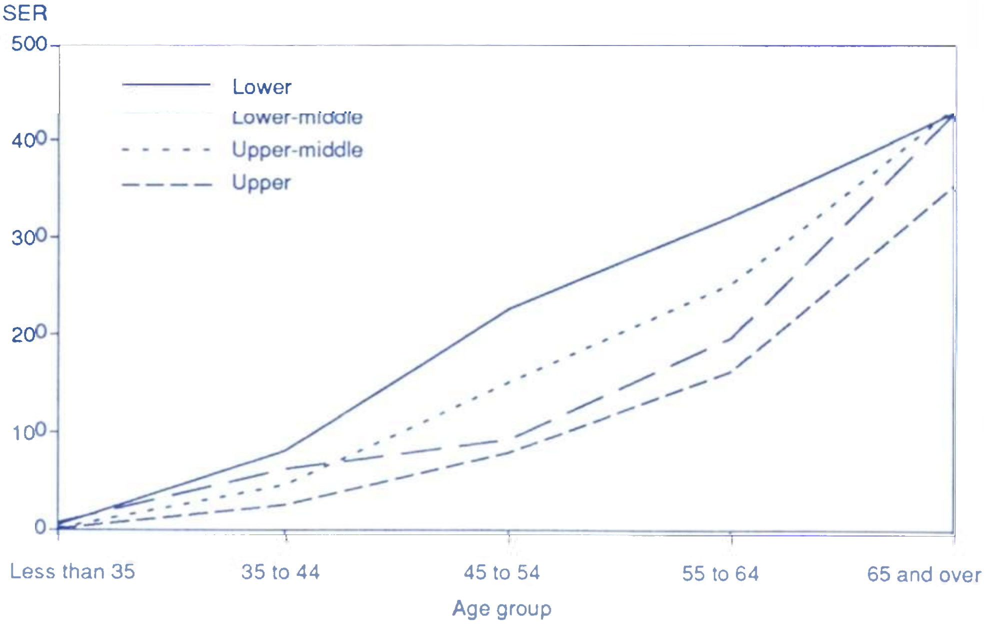
Box 4.9: Index of Education and Occupation

The Australian Bureau of Statistics has constructed a number of indexes designed to categorise areas on the basis of social and other information collected in the 1986 Census of Population and Housing (ABS 1990b). The indexes are compiled at small geographic levels known as Collection Districts (CD) and then aggregated into larger geographic areas such as postcodes or statistical local areas (SLAs). A CD is roughly equivalent to a small group of suburban blocks in urban areas.

The Index of Education and Occupation combines a number of measures of education and occupation. The education components in the index reflect the level of qualification achieved (for example, tertiary level, trade or no qualifications) and participation in further education. The occupation variables score the labourforce participation of the population in terms of unemployment and employment according to the major groups of the Australian Standard Classification of Occupations (ASCO—see Box 4.4, page 185).

Areas with high scores on the index have relatively high proportions of people with educational qualifications and employment in occupations requiring formal training. The combination of unemployment and low levels of formal training results in an area having a low score.

Figure 4.18: Age-specific standardised edentulism ratios(a), by quartile of education and occupation and age group, 1987–1988



(a) See text for details of standardised edentulism ratio (SER).

Source: AIHW DSRU, derived from 1987–88 National Oral Health Survey

Refer to Appendix 1, Table A53

Further insights into differentials in dental health status emerge from analysis of the four measures associated with caries experience and its consequences. These measures have been directly standardised for their analysis by education and occupation quartiles, with standardisation again controlling for variation in sex, country of birth and metropolitan residency. Caries experience measured by DMFT index showed a steady increase across the age groups, but little difference between quartiles by education and occupation (Figure 4.19). However, generally consistent differences between education and occupation quartiles are seen in the individual components of the DMFT index.

The number of decayed teeth varied over a fairly narrow range by age and education and occupation quartiles. However, for most age groups, there was a trend towards higher numbers of untreated decayed teeth among the lower education and occupation quartiles. The difference was most pronounced among young adults, with a greater than two-fold differential between the highest and lowest quartiles in the 25 to 34 year old group. The pattern for the oldest age group (65 years and over) is noteworthy, in that the highest quartile actually had the greatest number of untreated decayed teeth. This may reflect a tooth loss or survival phenomenon, both in terms of edentulism and missing teeth in dentate subjects. That is, higher levels of caries may exist in the highest quartile due in part to their greater tendency to remain dentate. Other, more complex risk factors and access issues may also be occurring among older adults.

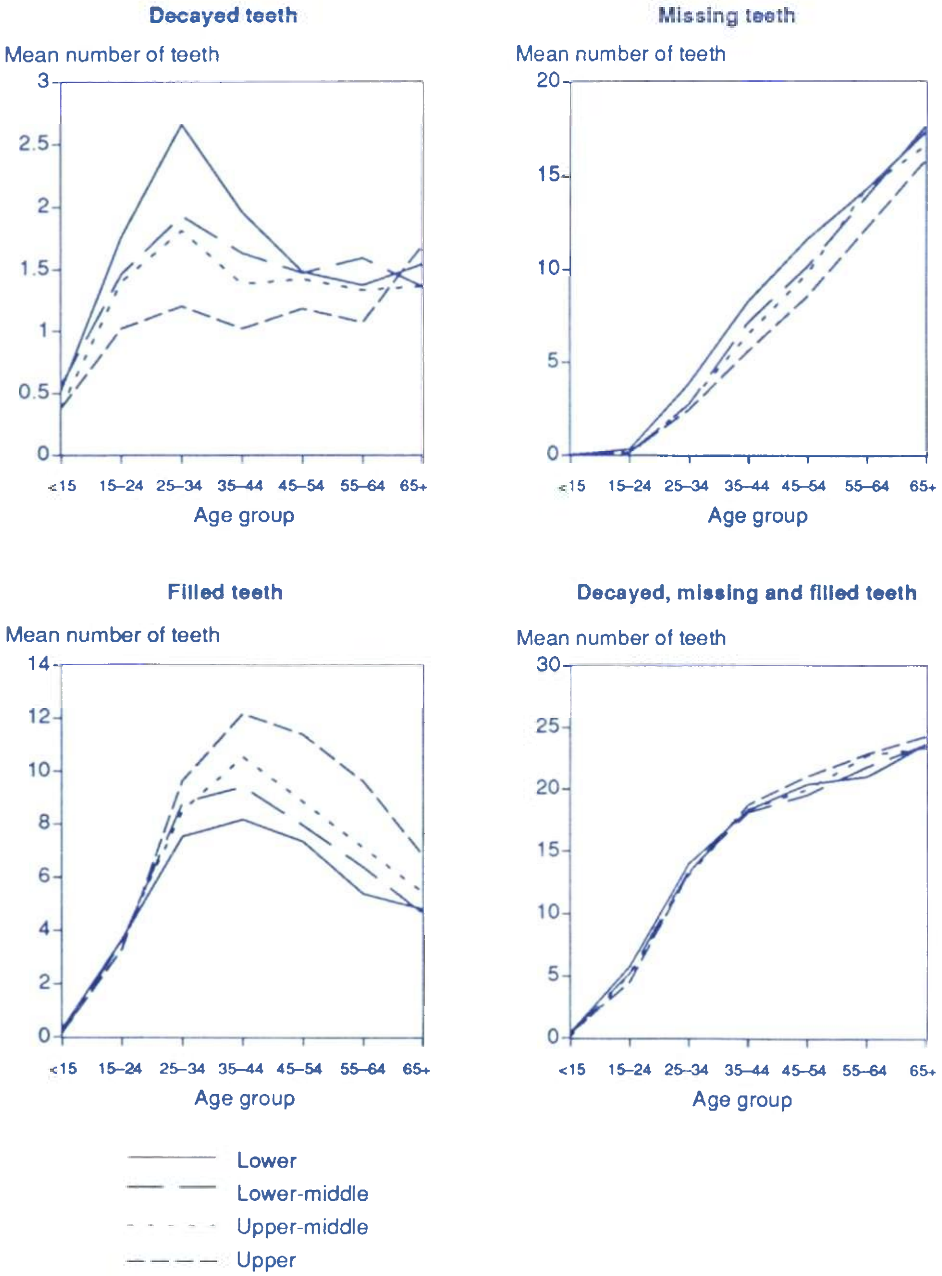
The number of missing teeth shows a similar pattern of divergence in middle adulthood. For example, for 45 to 54 year olds, people in the lowest education and occupation quartile had a mean of 11.9 missing teeth, while the highest quartile had a mean of 8.4 missing teeth. However, the differentials among children, young adults and the oldest age groups were less substantial. For adults in the highest quartile, the mean number of missing teeth was consistently less than for adults in the lowest quartile, but other inter-quartile differences were not consistent.

The number of filled teeth showed wide differentials by education and occupation quartile. People aged 35 to 64 years in the highest quartile had approximately four more filled teeth than those in the lowest quartile. Again, differences among children were not evident and there was some convergence among adults aged 65 years or older.

In interpreting these differentials in dental health status, it is important to recognise that the estimates are based on a small area analysis with aggregated dental health and socioeconomic data. This removes individual variation and tends to minimise the differentials observed. As well, the use of the wide age groups means that variation among young children appears minor, although individual level data indicate that expected differentials are observed. Hence, the differentials found are thought to be conservative and robust.

Social differentials in dental health manifest themselves predominantly through the consequences of disease not the disease itself. Hence, the differentials are strongest in terms of the pattern of treatment received for the presence of disease. Differentials between low and high socioeconomic status are seen in either extraction of teeth or a backlog of untreated decayed teeth with fewer filled teeth. This finding emphasises the issue of access to dental services, where access is viewed as both the opportunity to enter into dental care and make use of dental services in the best way of attaining and maintaining dental health.

Figure 4.19: Age-specific dental caries experience, by quartile of education and occupation, 1987–1988



Decayed teeth

Missing teeth

Filled teeth

Decayed, missing and filled teeth

Source: AIHW DSRU, derived from 1987–88 National Oral Health Survey

Refer to Appendix 1, Table A54

Childhood differentials in dental health

Non-aggregated data on children's dental health show small absolute differentials in caries experience and its consequences, but larger relative differentials. Data from a large longitudinal study of the dental health of 13 and 14 year-old students in South Australia illustrate these differentials (Table 4.14).

There are reasonably consistent differentials in the total caries experience of adolescents by highest educational level and occupation of parents, and by family income. While the differences in the number of untreated decayed teeth are small and inconsistent, the trends in the number of filled teeth parallel those of total caries experience. Hence, in contrast to the results from the 1987–88 National Oral Health Survey, there is a differential in overall dental health status, but access to dental care seems to show no differential in that disease has been treated in a similar manner across the various education, occupation and income categories. It is important to emphasise that all subjects for this study were recruited through the South Australian School Dental Service, and all of them necessarily were recipients of care from that service. This reflects the success of the school dental program in reducing access barriers, but challenges that program to make further inroads in preventing inequalities in dental health status.

Table 4.14: Dental caries experience[(a)] of 13- and 14-year-old school children, by educational level and occupation of parents and family income, South Australia, 1988–1989

	13-year-olds				*14-year-olds*			
	D	*M*	*F*	*DMFT*	*D*	*M*	*F*	*DMFT*
Highest educational level of parents								
Primary	0.29	—	2.21	2.49	0.29	—	2.48	2.77
Some secondary	0.32	0.01	1.94	2.27	0.27	—	2.11	2.39
Secondary	0.32	0.01	1.76	2.08	0.18	0.01	2.02	2.22
Tertiary	0.30	0.01	1.38	1.68	0.19	0.01	1.61	1.80
Occupation of parents								
Labourers etc.	0.23	0.03	2.07	2.33	0.26	0.03	2.09	2.37
Trades / Plant operators	0.35	0.02	1.96	2.32	0.21	0.01	2.18	2.40
Clerks / Sales	0.28	—	1.78	2.06	0.22	—	1.96	2.18
Para-professionals	0.30	—	1.62	1.92	0.26	—	1.88	2.14
Professionals / Managers	0.31	—	1.54	1.86	0.21	—	1.79	2.00
Family income per week								
Less than $250	0.31	—	1.76	2.07	0.19	—	2.00	2.19
$250–$350	0.24	0.02	1.95	2.21	0.29	0.01	2.13	2.44
$351–$500	0.35	0.01	1.85	2.20	0.21	0.01	2.05	2.27
$501–$800	0.35	0.01	1.69	2.04	0.22	0.01	1.97	2.20
More than $800	0.24	0.01	1.29	1.54	0.17	0.01	1.46	1.64

(a) D — Mean decayed teeth
M — Mean missing teeth
F — Mean filled teeth
DMFT — Mean decayed, missing and filled teeth.

Source: AIHW Dental Statistics and Research Unit

Differentials between Aboriginal and non-Aboriginal children

Recent data from the Northern Territory suggest the emergence of differentials between Aboriginal and non-Aboriginal children, both in dental health status and in access to consequent treatment. This appears to be a recent phenomenon, as up to the late 1980s it had been reported that Aboriginal children in the Northern Territory had lower levels of caries experience than non-Aboriginal children, even if the caries experience was largely untreated.

The following comparison is based on a sample of 3,138 Aboriginal children and 3,499 Australian-born non-Aboriginal children, drawn from those children aged 4 to 12 years using the Northern Territory School Dental Service between August and December 1989. Data were collected during routine dental examinations by dentists and dental therapists. Country of birth and Aboriginality of the children was recorded on the consent form completed by parents or guardians on enrolment in the School Dental Service.

After age-standardisation (using individual years of age), Aboriginal children had a higher total caries experience (including more decayed but fewer filled teeth) in the deciduous dentition than did Australian-born non-Aboriginal children (Table 4.15; Figure 4.20). In the permanent dentition, the total caries experience of the two groups was similar, but differences in the decayed and filled components were observed. For both groups, the number of missing teeth was very small.

The differences between Aboriginal and non-Aboriginal children were greatest at younger ages, with the total caries experience (deciduous and permanent dentition) being similar from 9 years of age. However, for all ages, Aboriginal children had an excess of decayed teeth and consistently fewer filled teeth than did non-Aboriginal children.

The sample of Aboriginal and non-Aboriginal children in this comparison was drawn from across the Northern Territory. This, together with the size of the comparison groups, suggests that the findings could well apply to other Aboriginal children, at least those living in remote parts of Australia.

Table 4.15: Dental caries experience(a) of Aboriginal and Australian-born non-Aboriginal children, by age, Northern Territory, 1989

(Mean number of teeth)

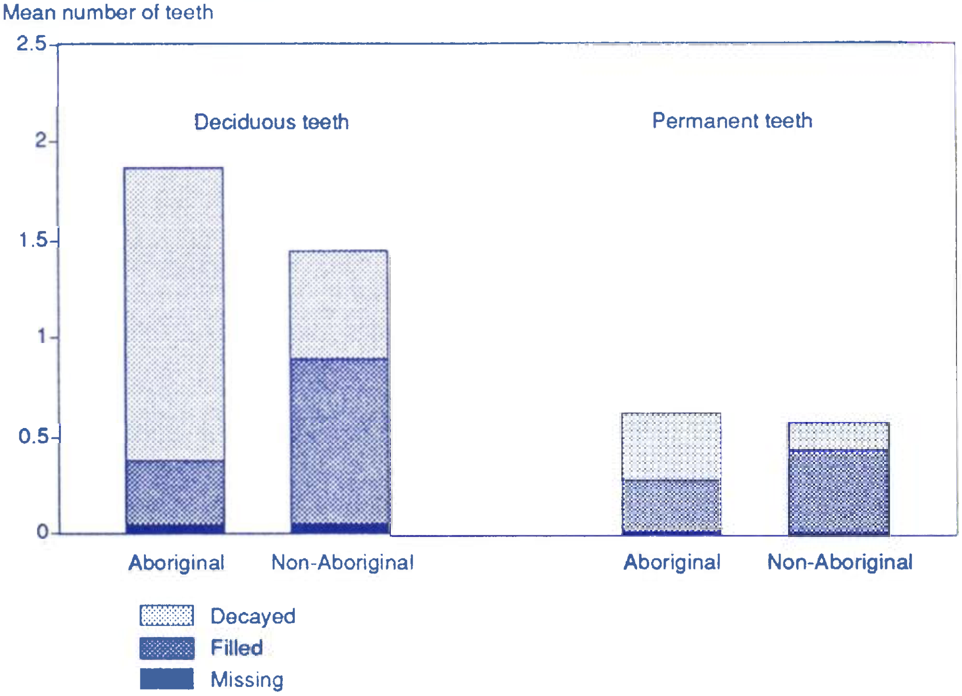
	Aboriginal				*Non-Aboriginal*			
Age (years)	*Decayed*	*Missing*	*Filled*	*dmf + DMF(b)*	*Decayed*	*Missing*	*Filled*	*dmf + DMF(b)*
4	1.86	0.01	0.06	1.93	0.97	0.07	0.32	1.36
5	2.69	0.03	0.36	3.07	0.80	0.04	0.54	1.39
6	2.54	0.08	0.35	2.97	0.80	0.10	0.78	1.68
7	2.41	0.03	0.55	2.99	0.78	0.10	0.98	1.85
8	1.79	0.13	0.74	2.66	0.75	0.05	1.49	2.29
9	1.72	0.09	0.47	2.28	0.70	0.09	1.54	2.33
10	1.33	0.10	0.61	2.04	0.61	0.05	1.66	2.31
11	0.83	0.04	0.62	1.49	0.35	0.06	1.45	1.86
12	0.55	0.05	0.84	1.44	0.30	0.03	1.13	1.47

(a) Deciduous and permanent teeth combined.

(b) Decayed, missing and filled. See Box 2.5, page 57.

Source: AIHW Dental Statistics and Research Unit

Figure 4.20: Age-standardised dental caries experience[a] of Aboriginal and Australian born non-Aboriginal children, Northern Territory, 1989



(a) Measured by an index of decayed, missing and filled teeth. See Box 2.5, page 57.

Source: AIHW Dental Statistics and Research Unit *Refer to Appendix 1, Table A55*

4.4 Differentials in risk factors

The importance of various risk factors in many of the major causes of disease and death, and the overall levels of a variety of risk factors, have been summarised in Section 2.5. That section considered the differences between males and females in levels of the risk factors. The following sections review other evidence for differentials in the level of risk factors.

As with Section 2.5, the main sources of information about risk factors differentials are the National Heart Foundation's 1989 Risk Factor Prevalence Survey (RFPS) and ABS's 1989–90 National Health Survey (1989–90 NHS). Data from these two surveys permit the analysis of risk factor differentials by a number of sociodemographic variables, as well as by geographic location. The following section summarises risk factors differentials by some of the sociodemographic characteristics used in Section 4.1—age, sex, education, employment status, occupation, income, and area of socioeconomic disadvantage. Most of these data on risk factors are derived from the 1989–90 NHS, but the analysis also includes data on hypertension and blood cholesterol from the 1989 RFPS. Largely because of differences in the nature of the data on physical characteristics—self-reported in the 1989–90 NHS and measured in the 1989 RFPS (see Section 2.5)—the differences in coronary heart disease risk factor levels between residents of the eight capital cities are also summarised separately in 'Differentials in coronary heart disease risk factors by capital cities' (page 235). These data, from the 1989 RFPS, are compared in 'International comparisons of coronary heart disease risk factors' (page 243) with measured data from a number of overseas cities.

Sociodemographic differentials in risk factors

This analysis of differentials in selected risk factors between sub-groups in the Australian population (characterised by age, sex, socioeconomic status and place of residence) is similar to that outlined in Section 4.1. It focuses on four broad age groups (children, young adults, working age adults and older people), data have been age-standardised to the total Australian population in 1988, differentials are presented as relative to a selected population sub-group, and statistically significant differentials are indicated by an asterisk in the Tables. In the text, these differences are described as 'significant'.

The various measures of socioeconomic status used to assess risk factor differentials are the same as those used in Section 4.1, and readers are referred to the relevant discussion in that Section.

The risk factors considered in this section are:

- *overweight or obesity*—people aged 15 years or more with a body mass index (BMI) of greater than 25.0 kg/m^2
- *physical inactivity*—people aged 15 years or more who undertake no physical exercise for recreation, sport or health and fitness reasons
- *smoking*—people aged 18 years or more who are current smokers
- *alcohol risk*—people aged 18 years or more who are at medium or high health risk due to alcohol consumption (medium risk was defined as the daily consumption of between 50 and 75 mls of alcohol by males, and of between 25 and 50 mls by females; high risk was defined as the daily consumption of more than 75 mls by males, and of more than 50 mls by females—ABS 1991)
- *hypertension*—capital city residents aged from 25 to 64 years with diastolic blood pressure greater than or equal to 95 mmHg and/or systolic blood pressure greater than or equal to 160 mmHg and/or who are taking tablets for blood pressure
- *elevated blood cholesterol*—capital city residents aged from 25 to 64 years with a cholesterol level of 5.5 mmol/L or higher
- *not breastfed*—children aged under 5 years who were not breastfed for three months or more and who are not currently being breastfed
- *rubella immunisation*—females aged 15 to 44 years who have been immunised against rubella
- *overall immunisation*—children aged 1 to 6 years who are fully or partly immunised for each of diphtheria, tetanus, whooping cough, poliomyelitis, measles and mumps, as appropriate for their age

As noted above, most differentials are based on self-reported information collected by the 1989–90 NHS. The data on hypertension and elevated blood cholesterol are based on the measurements made by the 1989 RFPS.

Differentials by age and sex

Even by the broad age groups used in this analysis, there are differentials by age in the prevalence of the various risk factors (Table 4.16). From information reported to the 1989–90 NHS, the prevalence of overweight or obesity and of physical inactivity was markedly higher for working age adults than for young adults, both for males and females. In contrast, the reported prevalences of smoking and alcohol risk decreased between these age groups, and were even lower for older people.

For all age groups, a significantly higher proportion of males than females reported heights and weights that placed them in the categories of overweight or obese, but the differential decreases with age. In contrast, for young adults and older people, participation in physical exercise for recreation, sport or health/fitness reasons was reported more frequently by males than females.

For young adults, the prevalence of smoking was the same for males and females, with 36 per cent reporting being smokers. Above this age group, significantly more males than females reported smoking. From reported information, substantially more males than females were assessed as at risk from alcohol, particularly working age adults.

Table 4.16: Differentials in risk factor prevalence rates by age group and sex, 1989–1990

	Rate[(a)]		
Age group / Risk factor	*Males*	*Females*	*Rate ratio*
Children			
Not breastfed (0–4 years)	22.5	23.4	0.96
Immunisation (0–6 years)	81.9	82.8	0.99
Young adults (15–24 years)			
Overweight and obesity	21.1	12.8	1.65 *
Physical inactivity	21.4	24.1	0.89 *
Smoking (18 years and over)	35.9	35.9	1.00
Alcohol risk (18 years and over)	17.1	10.1	1.70 *
Working age adults (25–64 years)			
Overweight and obesity	48.6	32.8	1.48 *
Physical inactivity	37.6	35.9	1.05
Smoking	33.8	25.6	1.32 *
Alcohol risk	15.7	7.6	2.06 *
Hypertension	17.2	11.2	1.54 *
Elevated cholesterol	17.6	15.3	1.15 *
Older people (65 years and over)			
Overweight and obesity	43.6	37.4	1.16 *
Physical inactivity	37.7	45.9	0.82 *
Smoking	15.9	10.9	1.45 *
Alcohol risk	6.5	4.4	1.46 *

(a) All rates age-standardised to 1988 total Australian population.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from ABS 1989–90 National Health Survey and National Heart Foundation 1989 Risk Factor Prevalence Survey

In contrast to the findings of the 1989–90 NHS, in which higher proportions of females than males reported hypertension as a recent illness or a long-term health condition, measurements taken as part of the 1989 RFPS revealed a significantly higher prevalence of hypertension among males than females. Blood lipid analysis undertaken by the 1989 RFPS also found that males had higher levels of elevated cholesterol than did females.

There were no significant differences between males and females in the proportions immunised or who were breastfed.

Differentials by education

The proportions of children aged up to 5 years who were breastfed differed significantly according to the education level of their parents. Male and female children whose parents had a medium level education had a 69 per cent higher rate of not being breastfed than did children whose parents had a high level of education. Compared with children whose parents had a high level of education, the differentials for those whose parents had a low education level were even greater—161 per cent higher rate of not being breastfed for males, and 133 per cent for females. For males (but not for females) aged 1 to 6 years, there was a tendency for rates of immunisation to decrease with decreasing education level of their parents, but the rates did not differ significantly.

For working age adults, overweight or obesity, physical inactivity and smoking increased significantly as education level decreased (Table 4.17). The trends were similar for older people, but fewer of the differences were significant.

Table 4.17: Selected risk factor differentials by education level, age group and sex, 1989–1990

	Rate ratio[(a)]					
Age group / Education level	*Overweight / obesity*	*Physical inactivity*	*Smoking*	*Alcohol risk*	*Hyper-tension*	*Elevated cholesterol*
Males						
Working age adults (25–64 years)						
High	1.00	1.00	1.00	1.00	1.00	1.00
Medium	1.09 *	1.31 *	1.37 *	1.16 *	1.07	1.02
Low	1.22 *	1.80 *	1.85 *	1.30	1.27 *	1.02
Older people (65 years and over)						
High	1.00	1.00	1.00	1.00	na	na
Medium	1.10	1.25	1.05	1.05	na	na
Low	1.16	1.56 *	1.31	0.99	na	na
Females						
Working age adults (25–64 years)						
High	1.00	1.00	1.00	1.00	1.00	1.00
Medium	1.29 *	1.34 *	1.42 *	0.87	1.75 *	1.23
Low	1.68 *	1.73 *	1.67 *	0.76	2.16 *	1.14
Older people (65 years and over)						
High	1.00	1.00	1.00	1.00	na	na
Medium	1.11	1.30 *	1.15	0.76	na	na
Low	1.37 *	1.55 *	1.10	0.38 *	na	na

(a) Differentials are shown as the ratio of the rates for the medium and low education groups to those of the high education group. All rates age-standardised to 1988 total Australian population.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from ABS 1989–90 National Health Survey and National Heart Foundation 1989 Risk Factor Prevalence Survey

Alcohol risk in working age males increased as education level decreased, but the differential was significant only between high and medium education levels. Interestingly, alcohol risk for females tended to decrease as education level decreased, but the difference was significant only for older women of high and low education levels.

The following results on differentials in hypertension and elevated blood cholesterol are not based on the same definitions of education levels used by the 1989–90 NHS. For these data, derived from the 1989 RFPS, low education was defined as not having completed high school (year 12 or equivalent), medium as having completed high school, and high as having tertiary qualifications.

For working age males and females, the prevalence of hypertension increased as education level decreased. For males, the only significant differential was between high and low education levels (27 per cent difference). For females, the differences between high and medium education (75 per cent) and between high and low education (116 per cent) were significant. Blood cholesterol levels tended to rise as education levels decreased, but none of the differences were significant.

Differentials by employment status

For males aged up to 5 years, the rate of not being breastfed was significantly higher (66 per cent) for those with neither parent employed than for those with at least one parent employed. For females, the difference was similar (65 per cent) and significant. Differences in rates of immunisation did not differ significantly between children aged 1 to 6 years according to employment status of their parents.

For working age adults, the differences in risk factors according to employment status were not consistent (Table 4.18). Smoking prevalence differed significantly between employed and other males, and between employed and unemployed females. The only other significant differences between employed and other people were:

- *overweight or obesity*—24 per cent higher rate for females not in the labourforce
- *physical inactivity*—27 per cent lower rate for unemployed females
- *alcohol risk*—lower rates for males and females not in the labourforce
- *hypertension*—higher rates for unemployed males (57 per cent higher) and for those not in the labourforce (72 per cent higher)

Table 4.18: Selected risk factor differentials by employment status and sex, working age adults (25–64 years), 1989–1990

	Rate ratio[a]					
Employment status	*Overweight / obesity*	*Physical inactivity*	*Smoking*	*Alcohol risk*	*Hyper-tension*	*Elevated cholesterol*
Males						
Employed	1.00	1.00	1.00	1.00	1.00	1.00
Unemployed	0.98	0.83	1.53 *	0.99	1.57 *	0.84
Not in labourforce	0.97	0.93	1.40 *	0.71 *	1.72 *	1.20
Females						
Employed	1.00	1.00	1.00	1.00	1.00	1.00
Unemployed	1.14	0.73 *	1.43 *	0.99	0.45	1.55
Not in labourforce	1.24 *	0.99	1.02	0.55 *	1.20	1.06

(a) Differentials are shown as the ratio of the rates for the unemployed and not in labourforce groups to those of the employed group. All rates age-standardised to 1988 total Australian population.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from ABS 1989–90 National Health Survey and National Heart Foundation 1989 Risk Factor Prevalence Survey

Differentials by occupation

Occupation was classified into the ASCO Major Occupation Groups (see Box 4.4, page 185), with children classified according to their parents' occupation. The only analyses undertaken were for children and for working age adults, and differentials were calculated relative to the 'professional' category.

For children, the only significant difference was for girls whose parents were labourers—they had a 94 per cent higher rate of not being breastfed than did female children of professionals.

The most striking differences between professionals and other occupational groups were the very much higher rates of smoking among the more physically-related occupations (tradespersons, plant and machine operators, and labourers). These occupations reported rates of smoking twice as high as did professionals, both for males and females (Table 4.19). Rates of smoking for the other occupations were also significantly higher than those for professionals.

Table 4.19: Selected risk factor differentials by occupation and sex, working age adults (25–64 years), 1989–1990

	Rate ratio[(a)]					
Occupation	*Overweight / obesity*	*Physical inactivity*	*Smoking*	*Alcohol risk*	*Hyper-tension*	*Elevated cholesterol*
Males						
Professionals	1.00	1.00	1.00	1.00	1.00	1.00
Managers and administrators	1.30 *	1.94 *	1.52 *	1.05	1.07	1.13
Para-professionals	1.24 *	1.57 *	1.44 *	1.10	1.30	0.84
Tradespersons	1.16 *	2.31 *	1.97 *	1.59 *	1.46 *	0.88
Clerks	1.13	1.59 *	1.62 *	1.19	1.42	1.10
Sales and service	1.20	1.57 *	1.74 *	1.29	1.10	1.20
Plant and machine operators	1.42 *	2.65 *	2.19 *	1.61 *	1.19	0.78
Labourers and related workers	1.29 *	2.60 *	2.28 *	1.47 *	1.13	0.98
Females						
Professionals	1.00	1.00	1.00	1.00	1.00	1.00
Managers and administrators	1.25	1.61 *	1.56 *	1.12	1.27	1.20
Para-professionals	1.27	1.21	1.50 *	0.76	2.62 *	1.33
Tradespersons	1.52 *	1.53 *	2.11 *	1.00	0.60	1.29
Clerks	1.16	1.29 *	1.51 *	0.86	1.84 *	1.46
Sales and service	1.06	1.64 *	1.84 *	0.86	1.44	1.19
Plant and machine operators	1.50	2.04 *	1.94 *	0.45	1.00	1.25
Labourers and related workers	1.58 *	1.96 *	2.15 *	0.75	2.08 *	1.75 *

(a) Differentials are shown as the ratio of the rates of the other occupational categories to those of the professional category. All rates age-standardised to 1988 total Australian population.

* $p<0.01$

Source: Australian Institute of Health and Welfare, derived from ABS 1989–90 National Health Survey and National Heart Foundation 1989 Risk Factor Prevalence Survey

The much higher reported rates of physical inactivity for tradespersons, plant and machine operators, and labourers need to be seen within the context of overall physical activity. It is perhaps understandable that those who have physically demanding jobs undertake less physical activity outside working hours. Other groups which reported significantly higher rates of physical inactivity than did professionals were:

- *managers and administrators*—males 94 per cent higher and females 61 per cent higher
- *para-professionals*—males 57 per cent higher
- *clerks*—males 59 per cent higher and females 29 per cent higher
- *sales and service*—males 57 per cent higher and females 64 per cent higher.

Compared with professionals, combinations of heights and weights classified as overweight or obese were reported significantly more frequently by:

- *managers and administrators*—males 30 per cent higher
- *para-professionals*—males 24 per cent higher
- *tradespersons*—males 16 per cent higher and females 52 per cent higher
- *plant and machine operators*—males 42 per cent higher
- *labourers*—males 29 per cent higher and females 58 per cent higher.

The differences between occupation groups in rates of alcohol risk were less consistent, with only males classified as tradespersons, plant and machine operators, and labourers reporting significantly higher rates than professionals. For females, many groups reported less alcohol risk than did professionals, but the difference was not significant for any occupational group.

For males, hypertension was 46 per cent more frequent among tradespersons than professionals. For females, rates of hypertension were significantly higher for para-professionals (162 per cent), clerks (84 per cent) and labourers (108 per cent) than for professionals.

The only significant difference in rates of elevated cholesterol was between female labourers and professionals, with labourers having a 75 per cent higher rate.

Differentials by income

As in Section 4.1, differentials according to income have been assessed according to high, medium and low 'equivalent family income' (income adjusted to allow for family composition—see Box 4.6, page 190). The differentials have been assessed relative to the high income group.

Female children aged 0 to 4 years in a family with low equivalent income had a 41 per cent higher rate of not being breastfed than did children in a family with high income. No other differentials for children were significant.

Reported rates of physical inactivity and smoking tended to be higher for people with medium and low incomes, and rates of alcohol risk tended to be lower (Table 4.20). For females, but not for males, reported rates of overweight or obesity tended to increase as family incomes decreased.

For people aged 15 to 24 years, compared with those with a high income, the only significant differences were:

- *overweight or obesity*—79 per cent more frequent for low income females
- *physical inactivity*—higher rates for males of medium income (35 per cent higher) and low income (47 per cent higher), and for females of low income (30 per cent higher)

- *smoking rates*—higher for females of medium income (28 per cent higher) and low income (36 per cent higher).

For working age males and females, the differentials in physical inactivity and smoking increased as income level decreased. For females, a similar increase occurred for overweight or obesity. In contrast, alcohol risk decreased with income level, significantly so for males of low income and for females of medium and low income. Rates of hypertension increased as income decreased—compared with males with a high income, the rate was 26 per cent higher for those with a medium income and 31 per cent higher for those with a low income. For females, the trend was the same, but only the difference between the high and low income groups (40 per cent higher) was significant. There were no significant differences between income groups in rates of rubella immunisation or in elevated cholesterol levels.

Table 4.20: Selected risk factor differentials by equivalent family income, age group and sex, 1989–1990

	Rate ratio(a)					
Age group / Equivalent family income	*Overweight / obesity*	*Physical inactivity*	*Smoking*	*Alcohol risk*	*Hyper-tension*	*Elevated cholesterol*
Males						
Young adults (15–24 years)						
High	1.00	1.00	1.00	1.00	na	na
Medium	0.98	1.35 *	1.19	0.99	na	na
Low	0.97	1.47 *	1.21	0.84	na	na
Working age adults (25–64 years)						
High	1.00	1.00	1.00	1.00	1.00	1.00
Medium	0.99	1.34 *	1.15 *	0.95	1.26 *	1.10
Low	1.02	1.39 *	1.41 *	0.79 *	1.31 *	1.13
Older people (65 years and over)						
High	1.00	1.00	1.00	1.00	na	na
Medium	1.06	1.27 *	1.42	0.76	na	na
Low	1.01	1.35 *	2.18 *	1.15	na	na
Females						
Young adults (15–24 years)						
High	1.00	1.00	1.00	1.00	na	na
Medium	1.37	1.16	1.28 *	0.97	na	na
Low	1.79 *	1.30 *	1.36 *	0.69	na	na
Working age adults (25–64 years)						
High	1.00	1.00	1.00	1.00	1.00	1.00
Medium	1.25 *	1.17 *	1.21 *	0.62 *	1.24	0.97
Low	1.47 *	1.28 *	1.41 *	0.52 *	1.40 *	0.96
Older people (65 years and over)						
High	1.00	1.00	1.00	1.00	na	na
Medium	1.16	1.22	1.15	0.47 *	na	na
Low	1.18	1.17	1.55	0.50 *	na	na

(a) Differentials are shown as the ratio of the rates for the medium and low income groups to those of the high income group. All rates age-standardised to 1988 total Australian population.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from ABS 1989–90 National Health Survey and National Heart Foundation 1989 Risk Factor Prevalence Survey

For older people, the significant differences were:

- *physical inactivity*—higher rates for males of medium income (27 higher) and low income (35 per cent higher) than for those of high income
- *smoking*—118 per cent more frequent for low income than high income males
- *alcohol risk*—lower rates for females of medium income (53 per cent lower) and low income (50 per cent lower) than for those of high income.

Differentials by area of socioeconomic disadvantage

For this analysis, which does not include hypertension and blood cholesterol, differentials are relative to the quintile containing persons living in the least disadvantaged areas (see Box 4.7).

There were no significant differentials for children aged under 15 years of age, and only two for people aged 15 to 24 years (Table 4.21):

- *overweight or obesity*—52 per cent more frequent for females in the second quintile than for those in the first quintile
- *physical inactivity*—34 per cent higher rate for females in the fifth quintile.

Differences between areas of socioeconomic disadvantage were most consistent for people aged 25 to 64 years. Compared with males and females living in areas of least disadvantage, those living in the three most disadvantaged groups of areas had significantly higher rates of physical inactivity and smoking (Table 4.21). Males in these three groups also had higher rates for alcohol risk, as did females for overweight or obesity. Rubella immunisation rates for females aged 25 to 44 years were lower in the more disadvantaged areas, but significantly so only for the areas of most disadvantage (10 per cent lower rates).

For people aged 65 years and over, the differences were less consistent, and the only significant ones related to rates of physical inactivity, particularly for females.

State, Territory and regional differences

Geographic differences in the prevalence of risk factors were assessed for States and Territories, and for metropolitan and non-metropolitan areas. Metropolitan areas were defined as the capital city statistical divisions for the six States and all of the Australian Capital Territory. Non-metropolitan areas comprised all other statistical divisions, including all of the Northern Territory.

State and Territory differentials were calculated relative to the total Australian figure, and region differentials relative to the metropolitan rate. As the 1989 RFPS included only residents of capital cities, hypertension and blood cholesterol were not included in this analysis of regional differences (see 'Differentials in coronary heart disease risk factors by capital cities', page 235, for detailed analysis of data on these and other risk factors from the 1989 RFPS).

The only significant differential for children aged under 15 years was that females in South Australia had a 60 per cent higher rate of not being breastfed (due to the small sample size, the rate for not breastfeeding for the Northern Territory could not be calculated).

There were no significant differentials between the States and Territories for people aged 15 to 24 years.

For people aged 25 to 64 years, the only significant differences from the Australia-wide figures were:

- *alcohol risk*—134 per cent higher for Northern Territory males, 13 per cent higher for New South Wales males, 17 per cent lower for Victorian males

Table 4.21: Selected risk factor differentials by quintile of socioeconomic disadvantage, age group and sex, 1989–1990

	Rate ratio(a)			
Age group / Quintile of socioeconomic disadvantage	*Overweight / obesity*	*Physical inactivity*	*Smoking*	*Alcohol risk*
Males				
Young adults (15–24 years)				
First quintile	1.00	1.00	1.00	1.00
Second quintile	1.06	1.13	1.16	0.91
Third quintile	1.03	1.26	1.04	0.97
Fourth quintile	1.18	1.19	1.02	0.90
Fifth quintile	1.13	1.07	1.24	0.97
Working age adults (25–64 years)				
First quintile	1.00	1.00	1.00	1.00
Second quintile	1.02	1.19 *	1.13	1.18
Third quintile	1.06	1.29 *	1.27 *	1.33 *
Fourth quintile	1.06	1.34 *	1.30 *	1.34 *
Fifth quintile	0.99	1.26 *	1.43 *	1.44 *
Older people (65 years and over)				
First quintile	1.00	1.00	1.00	1.00
Second quintile	1.09	1.32	1.01	0.90
Third quintile	0.93	1.27	1.53	0.82
Fourth quintile	1.07	1.49 *	1.40	0.92
Fifth quintile	1.05	1.25	1.47	1.12
Females				
Young adults (15–24 years)				
First quintile	1.00	1.00	1.00	1.00
Second quintile	1.52 *	1.16	1.16	0.87
Third quintile	1.20	1.11	1.08	1.01
Fourth quintile	1.20	1.26	1.28	0.90
Fifth quintile	1.03	1.34 *	1.22	0.97
Working age adults (25–64 years)				
First quintile	1.00	1.00	1.00	1.00
Second quintile	1.11	1.08	1.25 *	0.79
Third quintile	1.24 *	1.17 *	1.32 *	0.90
Fourth quintile	1.29 *	1.20 *	1.42 *	0.81
Fifth quintile	1.23 *	1.17 *	1.53 *	0.95
Older people (65 years and over)				
First quintile	1.00	1.00	1.00	1.00
Second quintile	1.02	1.09	0.93	0.83
Third quintile	1.16	1.31 *	1.13	0.81
Fourth quintile	1.25	1.30 *	1.15	0.59
Fifth quintile	1.17	1.27 *	1.32	1.05

(a) Differentials are shown as the ratio of the rates of the other quintiles of socioeconomic disadvantage to the first quintile. All rates age-standardised to 1988 total Australian population.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from ABS 1989–90 National Health Survey and National Heart Foundation 1989 Risk Factor Prevalence Survey

- *hypertension*—36 per cent lower for Northern Territory males, 19 per cent lower for Tasmanian males, 47 per cent higher for Queensland females, 35 per cent higher for Tasmanian females, 19 per cent lower for females in the Australian Capital Territory and 17 per cent lower for Northern Territory females
- *elevated cholesterol*—51 per cent more frequent for males in Tasmania, 15 per cent less frequent for males in the Northern Territory, 73 per cent higher rate for females in Tasmania, 34 per cent higher for females in Western Australia and the rate was 16 per cent lower for Northern Territory females.

Compared with residents of metropolitan areas, the significant differentials were:

- *physical inactivity*—15 per cent more frequent for non-metropolitan males aged 25 to 64 years, 28 per cent higher for non-metropolitan males aged 65 years and over, and 16 per cent higher for non-metropolitan females in that age group
- *smoking rate*—11 per cent higher for non-metropolitan females aged 25 to 64 years
- *alcohol risk*—28 per cent higher for non-metropolitan males aged 25 to 64 years.

Summary

There are significant differentials in the levels of a number of risk factors between various sub-groups of the Australian population.

While the prevalence of smoking and alcohol risk decreased with age, the prevalence of physical inactivity and overweight or obesity increased. The prevalence of most risk factors was higher for males than females at all ages, except for physical inactivity, which was more common for females than males in the young and older adult years.

Risk factor levels were strongly related to socioeconomic status, with both males and females of low socioeconomic status generally having higher levels than those of high socioeconomic status. The most notable exception was alcohol risk, for which females of low socioeconomic status had a lower risk than those of high status. The most consistent and strongest gradient in risk factor levels by socioeconomic status was for smoking. The differential in the prevalence of smoking between groups of low and high socioeconomic status was up to two-fold.

Differentials in coronary heart disease risk factors by capital cities

As noted in Section 2.5, the 1989 RFPS measured height, weight and blood pressure, undertook blood lipid analysis, and utilised a self-reported questionnaire to collect data on behavioural risk factors. This section considers the differentials between the eight capital cities for hypertension, total cholesterol levels, overweight or obesity, smoking, and exercise during leisure time. In preparing comparable estimates of the prevalence of these risk factors, the effects of differences in the age structures of the surveyed populations have been eliminated by using the World Standard Population as the standard.

Hypertension

Darwin had the lowest proportion (10 per cent) of men assessed as being hypertensive (see Table 4.22, including footnotes) and Melbourne the highest (20 per cent). Melbourne also had the highest proportion of untreated hypertensive males (12 per cent). For women, the prevalence of hypertension was lowest (slightly more than 10 per cent) in Perth, Darwin and Canberra, and highest in Hobart (16 per cent) and Brisbane (17 per cent) (Figure 4.21).

Of men assessed as being hypertensive, Darwin had the lowest proportion who were treated but uncontrolled (8.7 per cent). In the other cities, the proportion of male hypertensives who were treated but uncontrolled ranged from 18 per cent (Adelaide) to 24 per cent (Canberra). Among women, treated uncontrolled hypertensives, as a proportion of hypertensives, ranged from 16 per cent in Darwin to 26 per cent in Brisbane.

For all cities, men were less likely to have had their hypertension detected than women. Untreated hypertensives, as a proportion of total hypertensives, ranged from 44 per cent (Perth) to 59 per cent (Darwin) for men, and from 24 per cent (Perth) to 34 per cent (Sydney) for women.

Table 4.22: Hypertension by capital city and sex, 1989

(Per cent)

Hypertension	*Sydney*	*Melb.*	*Bris.*	*Perth*	*Adel.*	*Hobart*	*Canb.*	*Darwin*
Males								
Hypertensives								
Controlled[(a)]	4.3	4.9	3.7	4.7	5.2	3.8	3.4	3.3
Treated, uncontrolled[(b)]	3.8	3.8	3.9	2.8	3.2	2.9	4.2	0.9
Untreated[(c)]	8.2	11.7	10.8	5.9	9.5	7.8	10.2	6.1
Total hypertensives	16.3	20.4	18.3	13.3	17.9	14.5	17.7	10.4
Normotensives[(d)]	83.7	79.6	81.7	86.7	82.1	85.5	82.3	89.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of cases	813	423	384	483	944	523	491	491
Females								
Hypertensives								
Controlled[(a)]	5.6	5.8	7.1	5.6	6.8	8.0	4.8	5.8
Treated, uncontrolled[(b)]	2.4	2.3	4.4	2.1	2.1	3.1	2.3	1.7
Untreated[(c)]	4.1	3.5	5.7	2.4	4.0	5.0	3.5	3.0
Total hypertensives	12.1	11.7	17.2	10.1	12.9	16.1	10.5	10.5
Normotensives[(d)]	87.9	88.3	82.8	89.9	87.1	83.9	89.5	89.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of cases	869	421	431	480	967	560	490	509

(a) On tablets for blood pressure, SBP < 160 mmHg and DBP < 95 mmHg.

(b) On tablets for blood pressure, SBP ≥ 160 mmHg and/or DBP ≥ 95 mmHg.

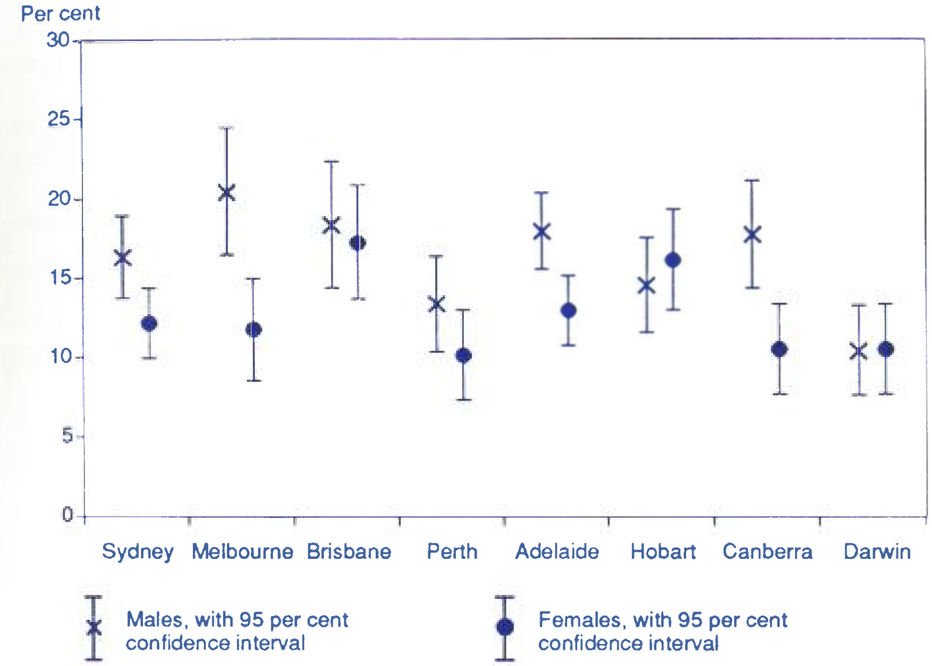
(c) Not on tablets for blood pressure, SBP ≥ 160 mmHg and/or DBP ≥ 95 mmHg.

(d) Not on tablets for blood pressure, SBP < 160 mmHg and DBP < 95 mmHg.

Note: All estimates are age standardised over the ages 20 to 69 years using the World Standard Population.

Source: AIHW, derived from National Heart Foundation 1989 Risk Factor Prevalence Survey

Figure 4.21: Hypertensives by capital city and sex



Source: AIHW, derived from NHF 1989 RFPS

Refer to Table 4.21

Blood cholesterol levels

Hobart had the highest proportion of people with elevated cholesterol levels (60 per cent of men and 53 per cent of women had a level of 5.5 mmol/L or more) (Table 4.23; Figure 4.22). For men, the city with the lowest proportion of elevated cholesterol was Melbourne (42 per cent), and for women it was Darwin (36 per cent).

This pattern is reflected in the mean and median levels of total cholesterol. The mean and median levels were clearly higher in Hobart than in any other city, and generally lowest in Melbourne and in Darwin. For men, median cholesterol levels varied from 5.3 mmol/L in Melbourne to 5.8 mmol/L in Hobart. For women, the median ranged from 5.0 mmol/L in Darwin to 5.8 mmol/L in Hobart.

Table 4.23: Blood cholesterol by capital city and sex, 1989

Blood cholesterol(a)	*Sydney*	*Melb.*	*Bris.*	*Perth*	*Adel.*	*Hobart*	*Canb.*	*Darwin*
Males								
Mean (mmol/L)	5.46	5.23	5.57	5.54	5.52	5.81	5.44	5.38
Median (mmol/L)	5.50	5.34	5.60	5.60	5.58	5.79	5.40	5.38
Cholesterol ≥ 5.5 mmol/L (%)	48.5	42.1	53.4	49.9	48.1	59.6	45.8	45.4
Number of cases	768	340	296	448	806	462	446	483
Females(b)								
Mean (mmol/L)	5.30	5.31	5.53	5.41	5.41	5.74	5.30	5.23
Median (mmol/L)	5.40	5.29	5.63	5.43	5.63	5.80	5.34	5.00
Cholesterol ≥ 5.5 mmol/L (%)	41.1	37.3	47.6	40.7	45.8	53.4	41.1	35.5
Number of cases	698	293	294	388	687	404	385	398

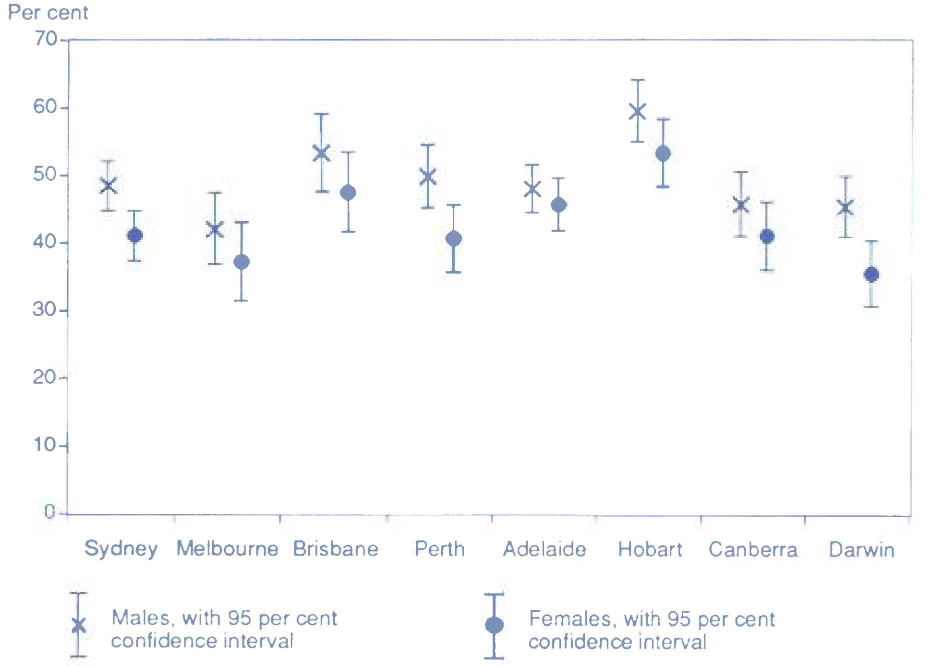
(a) Fasted (nothing to eat or drink in the 12 hours before testing apart from water, black tea or black coffee). Elevated cholesterol is defined as ≥ 5.5mmol/L.

(b) Excludes women taking the oral contraceptive pill.

Note: All estimates are age-standardised over the ages 20 to 69 years using the World Standard Population.

Source: AIHW, derived from National Heart Foundation 1989 Risk Factor Prevalence Survey

Figure 4.22: Persons with elevated blood cholesterol (≥ 5.5 mmol/L) by capital city and sex



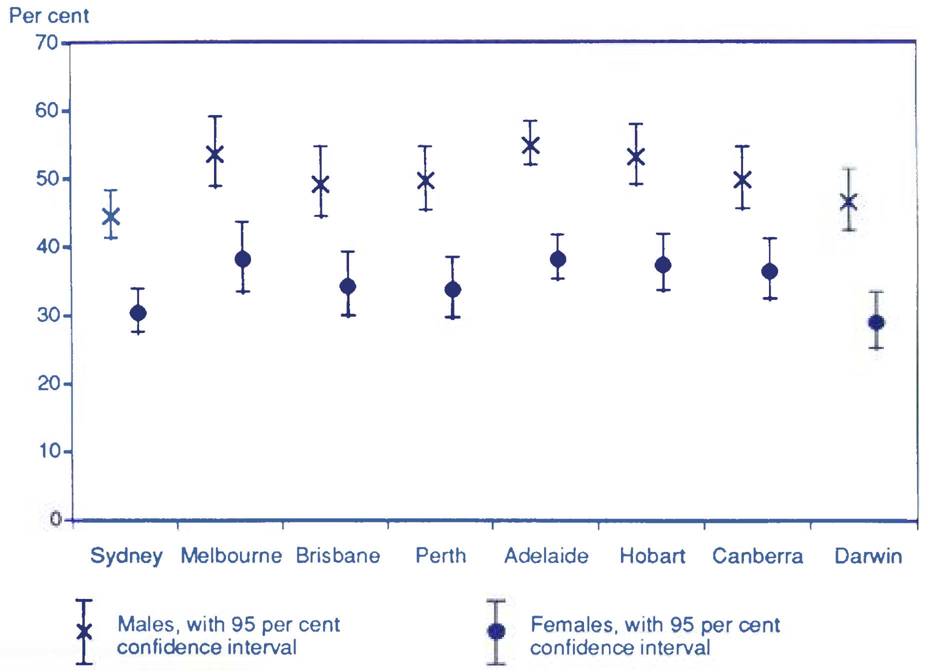
Source: AIHW, derived from NHF 1989 RFPS

Refer to Table 4.23

Weight for height

For each city, a higher proportion of men than women were classified as overweight or obese (Figure 4.23; Table 4.24).

Figure 4.23: Overweight or obese persons by capital city and sex



Source: AIHW, derived from NHF 1989 RFPS

Refer to Table 4.24

The proportion of overweight or obese males ranged from 45 per cent (Sydney) to 54 per cent (Melbourne) and 55 per cent (Adelaide). For females, the range was 29 per cent (Darwin) to 38 per cent (Hobart, Melbourne and Adelaide).

The prevalence of underweight women was highest in Sydney, Brisbane and Darwin (around 18 to 19 per cent), and lowest in Adelaide and Canberra (around 11 per cent). The prevalence of underweight men was highest in Darwin and Brisbane (7 per cent), and lowest in Canberra and Adelaide (3 per cent).

Table 4.24: Weight for height classification by capital city and sex, 1989

(Per cent)

Classification(a)	*Sydney*	*Melb.*	*Bris.*	*Perth*	*Adel.*	*Hobart*	*Canb.*	*Darwin*
Males								
Underweight	4.7	4.5	6.7	4.4	3.3	4.7	3.2	7.2
Acceptable weight	50.6	41.8	43.9	45.8	41.6	41.9	46.7	46.0
Overweight	37.2	41.8	40.2	40.4	43.0	40.4	40.2	37.2
Obese	7.5	12.0	9.2	9.5	12.1	13.0	9.8	9.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of cases	811	381	383	482	940	523	488	489
Females(b)								
Underweight	19.2	11.9	18.7	13.2	10.8	12.3	11.6	17.7
Acceptable weight	50.2	49.6	46.8	52.7	50.8	50.1	51.7	53.2
Overweight	20.2	25.3	24.2	23.3	24.3	24.8	24.5	20.7
Obese	10.4	13.1	10.3	10.7	14.1	12.8	12.2	8.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of cases	852	369	423	460	945	548	482	495

(a) Based on body mass index calculated as BMI = Wt (kg) / Ht $(m)^2$ (1 kg deducted from the measured weight as allowance for weight of clothing). Underweight: BMI < 20; acceptable weight: 20 ≥ BMI ≥ 25; overweight: 25 < BMI ≤ 30; obese: BMI > 30.

(b) Excludes pregnant women.

Note: All estimates are age-standardised over the ages 20 to 69 years using the World Standard Population.

Source: AIHW, derived from National Heart Foundation 1989 Risk Factor Prevalence Survey

Smoking

A comparison of estimates of smoking prevalence rates based on data from the 1989 RFPS and the 1989–90 NHS suggested that the 1989 RFPS city estimates were affected by differential under-reporting which, in turn, affected the relative ranks of the cities (AIHW unpublished). For this reason, capital city estimates from the 1989–90 NHS have been preferred. However, estimates for Darwin and Canberra were based on small sample sizes and have been omitted from this comparison.

According to the 1989–90 NHS, there is little variation between cities in the prevalence of smoking. For men aged 20 to 69 years, prevalence rates ranged from 34 per cent in Sydney to 31 per cent in Hobart. For women, the smoking prevalence rate was marginally higher in Hobart and Brisbane (27 per cent) than in Adelaide (24 per cent).

Exercise during leisure time

During the two weeks before interview, exercise of some form was most common for men living in Canberra (79 per cent) and least common for women living in Darwin (65 per cent) (Table 4.25; Figure 4.24). Regular vigorous exercise was more likely to be practised by people in Canberra (18 per cent of men and 9 per cent of women) and Darwin (17 per cent of men and 10 per cent of women), and was least common in Sydney (8 per cent of men and 5 per cent of women). Walking for recreation or exercise was practised most in Hobart (57 per cent of men and 65 per cent of women) and least in Darwin (43 per cent of men and 48 per cent of women).

Table 4.25: Exercise during leisure time by capital city and sex, 1989

(Per cent)

Exercise[a]	*Sydney*	*Melb.*	*Bris.*	*Perth*	*Adel.*	*Hobart*	*Canb.*	*Darwin*
Males								
Vigorous exercise[b]								
Group 1[c]	7.5	11.2	11.3	10.8	9.3	11.3	17.9	16.8
Group 2[d]	28.4	28.0	24.6	27.1	25.5	24.3	28.6	21.5
Less vigorous exercise[e]	32.6	31.9	31.6	33.7	29.3	33.6	40.5	38.0
Walking	52.6	53.3	54.3	48.5	51.8	56.8	54.5	42.6
No exercise	26.7	27.1	26.0	25.2	28.6	25.2	20.9	26.6
Number of cases	813	423	384	483	944	523	491	491
Females								
Vigorous exercise[b]								
Group 1[c]	5.2	6.9	4.6	5.8	6.2	5.6	8.5	9.8
Group 2[d]	24.1	24.2	25.5	24.4	23.2	21.2	22.3	18.2
Less vigorous exercise[e]	31.5	28.5	27.3	28.6	24.0	28.1	33.1	31.7
Walking	61.9	57.6	56.5	58.3	59.3	65.1	63.5	47.9
No exercise	24.3	29.1	31.0	28.3	28.7	27.8	24.7	35.4
Number of cases	869	421	431	480	967	560	490	509

(a) Exercise for recreation, sport or health fitness purposes in the past 2 weeks.

(b) Exercise which made you breathe harder or puff and pant.

(c) Average of 3 or more sessions of vigorous exercise per week and 20 minutes or more per session.

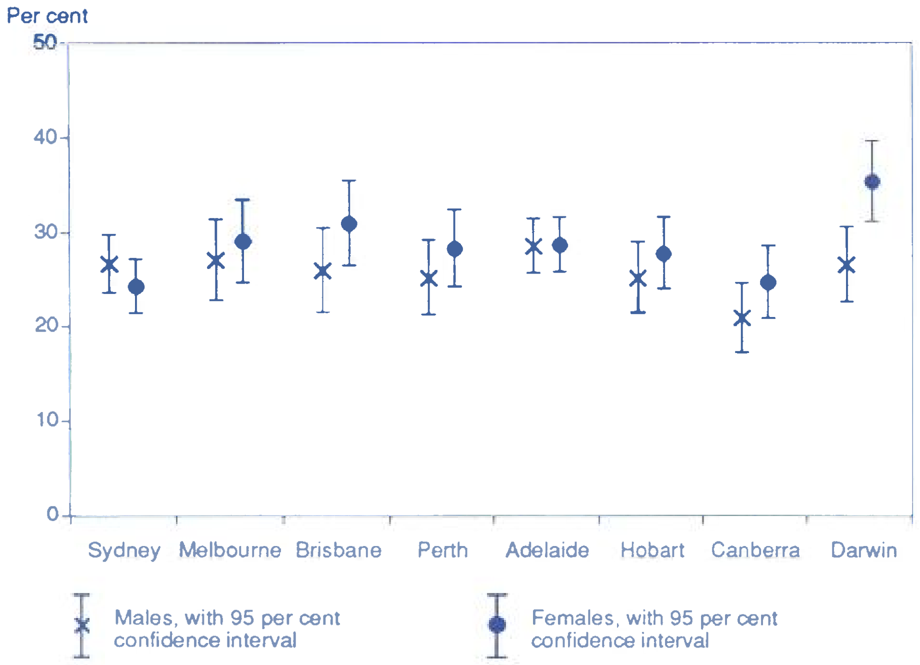
(d) Average of less than 3 sessions of vigorous exercise per week or less than 20 minutes per session.

(e) Exercise which did not make you breathe harder or puff and pant.

Note: All estimates are age-standardised over the ages 20 to 69 years using the World Standard Population.

Source: AIHW, derived from National Heart Foundation 1989 Risk Factor Prevalence Survey

Figure 4.24: Persons not exercising[(a)] by capital city and sex



(a) No exercise of any kind for recreation, sport or health fitness in the past 2 weeks.

Source: AIHW, derived from NHF 1989 RFPS *Refer to Table 4.25*

Risk factor profiles

To compare the risk factor profiles for men and women in each city, the age-standardised estimates of prevalence of hypertension, elevated cholesterol, overweight or obesity, and no recreational exercise were ranked (Table 4.26). From these rankings, men and women in Sydney, Perth, Canberra and Darwin had better risk factor profiles than people in Melbourne, Brisbane, Adelaide and Hobart.

Table 4.26: Prevalence and rank of major cardiovascular risk factors by capital city and sex, 1989

Risk factor	*Sydney*	*Melb.*	*Bris.*	*Perth*	*Adel.*	*Hobart*	*Canb.*	*Darwin*
Males								
Prevalence (Per cent)								
Hypertensives	16.3	20.4	18.3	13.3	17.9	14.5	17.7	10.4
Raised cholesterol	48.5	42.1	53.4	49.9	48.1	59.6	45.8	45.4
Overweight or obese	44.7	53.8	49.4	49.9	55.1	53.4	50.0	46.8
No exercise	26.7	27.1	26.0	25.2	28.6	25.2	20.9	26.6
Rank[(a)]								
Hypertensives	4	8	=5	2	=5	3	=5	1
Raised cholesterol	=4	1	7	6	=4	8	=2	=2
Overweight or obese	1	=6	=3	=3	8	=6	=3	2
No exercise	=5	7	4	=2	8	=2	1	=5
Females								
Prevalence (Per cent)								
Hypertensives	12.1	11.7	17.2	10.1	12.9	16.1	10.5	10.5
Raised cholesterol	41.1	37.3	47.6	40.7	45.8	53.4	41.1	35.5
Overweight or obese	30.6	38.4	34.5	34.0	38.4	37.6	36.7	29.2
No exercise	24.3	29.1	31.0	28.3	28.7	27.8	24.7	35.4
Rank[(a)]								
Hypertensives	5	4	8	1	6	7	=2	=2
Raised cholesterol	=3	2	7	=3	6	8	=3	1
Overweight or obese	2	=7	=3	=3	=7	6	5	1
No exercise	=1	=5	7	=3	=5	=3	=1	8

(a) For each risk factor, cities have been ranked from 1= lowest prevalence to 8 = highest prevalence. Equal rank (=) has been given when prevalence estimates are relatively close.

Note: All estimates are age-standardised over the ages 20 to 69 years using the World Standard Population.

Source: AIHW, derived from National Heart Foundation Risk Factor Prevalence Survey

International comparisons of coronary heart disease risk factors

A WHO cardiovascular disease monitoring project (MONICA) has recently provided results of baseline population surveys of risk factors in 39 collaborating centres in 26 countries (WHO MONICA Project 1989). Since the same standard methods were used in the 1989 RFPS and in the MONICA project, these data provide an opportunity to compare the risk factor levels in Australian capital cities with those in a number of overseas populations. Although the surveys were not all conducted at the same time, the majority were conducted within a relatively short interval and provide a reasonable basis for comparison.

To enable comparison, the data from the 1989 RFPS were reprocessed with the MONICA definitions of risk factors and standardised using the World Standard Population weights. Comparisons are provided for systolic blood pressure, total cholesterol and body mass index. Populations are ordered independently for men and women by ascending median level of the risk factor (the tables give median, 10th and 90th percentile values of the risk factor distributions in the various populations). Estimates for the selected MONICA centres relate to various years ranging from

1978–1980 (Stanford, USA) to 1986–1987 (Catalonia, Spain). Estimates for the Australian RFPS centres relate to 1989.

Systolic blood pressure

Systolic blood pressure levels in Australian cities compare favourably with those in overseas cities, with Australian levels generally lower than in most MONICA centres (the figures take no account of the proportions of people who were on treatment for hypertension). Only men in Catalonia and Iceland reported median blood pressure levels lower than those in Darwin in 1989 (Table 4.27), and for women the level in Darwin was lower than in any MONICA centre shown (Table 4.28).

Blood cholesterol

For women, median total cholesterol levels were lower for those living in Darwin (5.0 mmol/L) and Melbourne (5.2 mmol/L) than in all MONICA centres except Beijing (3.3 mmol/L) (Table 4.30). Levels among Australian men were generally about average, with the median level ranging from 5.6 to 6.0 mmol/L, compared with 4.1 mmol/L (Beijing) to 6.4 mmol/L for the MONICA centres (Table 4.29).

Populations whose mean total cholesterol values are 4.14 mmol/L or less have little or no clinical coronary heart disease (CHD), and populations with mean levels between 4.14 and 5.17 mmol/L have intermediate or low CHD rates (WHO Expert Committee 1982). Apart from Beijing, women in Darwin and women in Melbourne were among the few populations surveyed to have a median total cholesterol level below or around 5.17 mmol/L (Table 4.30). In the vast majority of cities, including Australian ones, more than half the population had total cholesterol levels greater than 5.17 mmol/L.

Body mass index

In comparison with the MONICA centres, Australian women fared better than did Australian men. Median body mass index for women living in Darwin (23.7) and Sydney (23.8) was only marginally below the best levels in Stanford, US (23.5) and Glostrup, Denmark (23.5) (Table 4.32). Overall, levels for women in Perth, Brisbane and Canberra compared favourably with the MONICA centres, and levels for those living in Hobart, Adelaide, Melbourne and Darwin were around average.

For men, median body mass index ranged from 23.4 (Beijing) to 27.5 (Kaunas, USSR), with the best Australian cities being Darwin (25.5) and Sydney (25.6) (Table 4.31).

In terms of obesity (defined as a body mass index greater than 30), at least ten per cent of men and women living in the Australian cities, and in the vast majority of all cities, were obese.

Table 4.27: Systolic blood pressure, age-standardised percentiles for Australian capital cities and selected MONICA Project centres, males aged 35–64 years, 1978–1989

Population	*No. of observations*	*Percentiles (mmHg)*		
		10th	*50th*	*90th*
Catalonia, Spain	397	105	121	146
Iceland	657	107	123	146
Darwin, Australia	**328**	**110**	**124**	**150**
Glostrup,Denmark	1,456	108	125	148
Ghent, Belgium	426	110	126	146
Perth, Australia	**296**	**112**	**126**	**152**
Beijing, China	618	106	126	162
Stanford, USA	434	110	127	147
Canberra, Australia	**308**	**111**	**127**	**154**
Rhein-Neckar region, FRG	739	110	128	153
Charleroi, Belgium	275	114	129	151
Adelaide, Australia	**578**	**111**	**129**	**155**
Newcastle, Australia(a)	1,219	112	129	156
Haute-Garonne, France	678	113	130	150
Brisbane, Australia	**234**	**111**	**130**	**152**
Vaud / Fribourg, Switzerland	624	112	130	153
Hobart, Australia	**327**	**113**	**130**	**154**
Sydney, Australia	**526**	**113**	**130**	**154**
Budapest, Hungary	591	110	130	160
Tarnobrzeg Voivodship, Poland	1,250	111	130	160
Northern Sweden	647	112	131	151
Luxemberg Province, Belgium	985	114	131	153
Auckland, New Zealand	1,019	111	131	155
Ticino, Switzerland	781	112	131	156
Novi Sad, Yugoslavia	606	117	132	160
Belfast, Northern Ireland	927	112	132	163
Melbourne, Australia	**253**	**114**	**133**	**157**
Augsburg (rural), FRG	846	117	133	158
Moscow (control), USSR	775	109	133	167
Augsburg (urban), FRG	712	114	134	159
Moscow (intervention), USSR	1,165	115	134	164
Glasgow, Scotland	498	116	134	165
Czechoslovakia	943	118	135	163
Brianza Area, Italy	615	115	136	162
Malta	656	120	136	162
Halle County, GDR	982	117	137	164
Pecs, Hungary	605	116	137	166
Bremen, FRG	640	118	139	163
Berlin-Lichtenberg, GDR	526	120	139	163
Turku / Loimaa, Finland	1,199	120	140	168
Friuli, Italy	713	120	140	170
Warsaw, Poland	1,309	119	140	174
North Karelia, Finland	1,144	121	143	169
Bas-Rhin, France	666	122	143	170
Kuopio Province, Finland	977	124	145	171

(a) WHO MONICA collaborative centre, 1983 data. Not part of 1989 Risk Factor Prevalence Study.

Sources: WHO MONICA Project 1989
Australian Institute of Health and Welfare

Table 4.28: Systolic blood pressure, age-standardised percentiles for Australian capital cities and selected MONICA Project centres, females aged 35–64 years, 1978–1989

Population	*No. of observations*	*Percentiles (mmHg)* 10th	50th	90th
Darwin, Australia	**308**	**100**	**114**	**150**
Ghent, Belgium	348	102	117	144
Iceland	703	102	118	143
Catalonia, Spain	389	101	118	146
Perth, Australia	**305**	**102**	**119**	**148**
Canberra, Australia	**313**	**103**	**120**	**143**
Stanford, USA	520	105	120	148
Glostrup,Denmark	1,361	104	121	147
Brisbane, Australia	**276**	**105**	**122**	**153**
Charleroi, Belgium	247	107	123	147
Vaud / Fribourg, Switzerland	566	106	123	148
Auckland, New Zealand	568	104	123	150
Rhein-Neckar region, FRG	784	104	123	153
Adelaide, Australia	**565**	**106**	**125**	**149**
Haute-Garonne, France	645	105	125	150
Newcastle, Australia[a]	1,245	105	125	156
Melbourne, Australia	**268**	**105**	**126**	**150**
Sydney, Australia	**563**	**107**	**126**	**151**
Northern Sweden	614	107	126	154
Ticino, Switzerland	769	107	126	154
Hobart, Australia	**332**	**108**	**127**	**156**
Beijing, China	641	102	127	157
Luxemberg Province, Belgium	949	108	127	157
Augsburg (urban), FRG	679	107	128	157
Augsburg (rural), FRG	857	110	128	157
Budapest, Hungary	579	105	129	160
Belfast, Northern Ireland	923	108	129	162
Brianza Area, Italy	630	110	131	160
Glasgow, Scotland	478	109	131	166
Tarnobrzeg Voivodship, Poland	1,472	110	131	170
Novi Sad, Yugoslavia	576	113	132	160
Czechoslovakia	990	110	133	160
Bas-Rhin, France	714	113	133	166
Turku / Loimaa, Finland	1,280	114	133	166
Moscow (intervention), USSR	1,239	112	133	170
Pecs, Hungary	619	110	134	170
Moscow (control), USSR	650	112	134	179
Berlin-Lichtenberg, GDR	565	115	135	163
Bremen, FRG	658	114	135	168
Friuli, Italy	727	112	136	166
Malta	687	119	138	165
Halle County, GDR	1,055	116	138	172
Warsaw, Poland	1,337	114	138	176
North Karelia, Finland	1,238	118	141	169
Kuopio Province, Finland	988	119	143	176

(a) WHO MONICA collaborative centre, 1983 data. Not part of 1989 Risk Factor Prevalence Study.

Sources: WHO MONICA Project 1989
Australian Institute of Health and Welfare

Table 4.29: Total cholesterol, age-standardised percentiles for Australian capital cities and MONICA Project centres, males aged 35–64 years, 1978–1989

		Percentiles (mmol/L)		
Population	*No. of observations*	*10th*	*50th*	*90th*
Beijing, China	619	3.3	4.1	5.4
Tarnobrzeg Voivodship, Poland	1,238	4.2	5.3	6.6
Stanford, USA	432	4.2	5.3	6.9
Warsaw, Poland	1,289	4.4	5.5	6.8
Ticino, Switzerland	751	4.3	5.5	6.9
Bas-Rhin, France	638	4.3	5.5	7.0
Melbourne, Australia	**253**	**4.2**	**5.6**	**6.9**
Darwin, Australia	**328**	**4.3**	**5.6**	**6.9**
Brianza Area, Italy	616	4.2	5.6	7.1
Auckland, New Zealand	1,005	4.5	5.7	7.0
Sydney, Australia	**526**	**4.6**	**5.7**	**7.0**
Perth, Australia	**296**	**4.5**	**5.7**	**7.1**
Rhein-Neckar region, FRG	1,158	4.4	5.7	7.2
Canberra, Australia	**308**	**4.6**	**5.7**	**7.2**
Budapest, Hungary	586	4.5	5.7	7.3
Newcastle, Australia[a]	1,201	4.5	5.7	7.3
Adelaide, Australia	**578**	**4.6**	**5.8**	**7.1**
Brisbane, Australia	**234**	**4.7**	**5.8**	**7.1**
Haute-Garonne, France	659	4.5	5.9	7.3
Belfast, Northern Ireland	916	4.7	5.9	7.4
Kaunas, USSR	727	4.7	5.9	7.4
Hobart, Australia	**327**	**4.8**	**6.0**	**7.6**
Bremen, FRG	627	4.8	6.0	7.7
Iceland	656	5.0	6.1	7.5
Goteborg, Sweden	499	4.7	6.1	7.6
Turku / Loimaa, Finland	1,205	4.9	6.1	7.6
Charleroi, Belgium	266	4.7	6.1	7.7
Ghent, Belgium	415	4.7	6.1	7.7
Augsburg (rural), FRG	808	4.8	6.1	7.8
Glasgow, Scotland	464	4.9	6.2	7.7
Augsburg (urban), FRG	664	4.9	6.2	7.8
Glostrup, Denmark	1,454	4.9	6.2	7.9
Kuopio Province, Finland	977	4.9	6.2	7.9
Czechoslovakia	948	5.0	6.3	7.9
North Karelia, Finland	1,146	5.0	6.3	7.9
Vaud / Fribourg, Switzerland	620	5.0	6.3	8.1
Luxembourg Province, Belgium	989	5.0	6.4	8.1

(a) WHO MONICA collaborative centre, 1983 data. Not part of 1989 Risk Factor Prevalence Study.

Sources: WHO MONICA Project 1989
Australian Institute of Health and Welfare

Table 4.30: Total cholesterol, age-standardised percentiles for Australian capital cities and MONICA Project centres, females aged 35–64 years, 1978–1989

Population	*No. of observations*	*Percentiles (mmol/L)*		
		10th	*50th*	*90th*
Beijing, China	641	3.3	4.2	5.5
Darwin, Australia	**308**	**4.2**	**5.0**	**6.8**
Stanford, USA	513	4.2	5.2	6.6
Ticino, Switzerland	731	4.3	5.2	6.6
Melbourne, Australia	**268**	**3.9**	**5.2**	**6.9**
Bas-Rhin, France	666	4.3	5.4	6.8
Tarnobrzeg Voivodship, Poland	1,462	4.2	5.4	6.9
Warsaw, Poland	1,301	4.4	5.5	6.8
Brianza Area, Italy	631	4.2	5.5	7.0
Sydney, Australia	**563**	**4.2**	**5.5**	**7.0**
Canberra, Australia	**313**	**4.2**	**5.5**	**7.1**
Perth, Australia	**305**	**4.3**	**5.5**	**7.1**
Newcastle, Australia[(a)]	1,195	4.5	5.6	7.3
Adelaide, Australia	**565**	**4.5**	**5.7**	**7.1**
Rhein-Neckar region, FRG	1,257	4.4	5.7	7.2
Auckland, New Zealand	562	4.5	5.7	7.2
Haute-Garonne, France	606	4.5	5.7	7.4
Brisbane, Australia	**276**	**4.4**	**5.8**	**7.2**
Budapest, Hungary	565	4.5	5.8	7.4
Charleroi, Belgium	225	4.7	5.8	7.5
Hobart, Australia	**332**	**4.5**	**5.9**	**7.5**
Ghent, Belgium	330	4.7	5.9	7.5
Augsburg (rural), FRG	825	4.8	5.9	7.5
Kaunas, USSR	735	4.7	6.0	7.5
Vaud / Fribourg, Switzerland	544	5.0	6.0	7.5
Belfast, Northern Ireland	914	4.7	6.0	7.6
Augsburg (urban), FRG	623	4.9	6.0	7.7
Bremen, FRG	640	4.8	6.0	7.8
Turku / Loimaa, Finland	1,280	4.9	6.0	7.8
Goteborg, Sweden	547	4.7	6.0	7.9
Glostrup, Denmark	1,359	4.9	6.1	7.8
Iceland	703	5.0	6.2	7.8
Kuopio Province, Finland	988	4.9	6.2	8.0
North Karelia, Finland	1,239	5.0	6.2	8.1
Czechoslovakia	990	5.0	6.3	8.0
Luxembourg Province, Belgium	954	5.0	6.3	8.1
Glasgow, Scotland	424	4.9	6.4	8.3

(a) WHO MONICA collaborative centre, 1983 data. Not part of 1989 Risk Factor Prevalence Study.

Sources: WHO MONICA Project 1989
Australian Institute of Health and Welfare

Table 4.31: Body mass index, age-standardised percentiles for Australian capital cities and MONICA Project centres, males aged 35–64 years, 1978–1989

Population	*No. of observations*	*Percentiles (kg/m²)* *10th*	*50th*	*90th*
Beijing, China	616	19.5	23.4	27.6
Goteborg, Sweden	517	21.6	25.0	29.1
Tarnobrzeg Voivodship, Poland	1,249	20.7	25.2	30.6
Auckland, New Zealand	1,019	22.0	25.4	29.5
Glasgow, Scotland	499	21.4	25.4	30.1
Glostrup, Denmark	1,456	21.7	25.4	30.3
Iceland	656	21.8	25.4	30.3
Haute-Garonne, France	675	21.5	25.5	29.8
Belfast, Northern Ireland	924	21.8	25.5	30.2
Darwin, Australia	**328**	**21.4**	**25.5**	**30.3**
Brianza Area, Italy	614	21.9	25.5	30.3
Stanford, USA	433	21.7	25.6	29.9
Sydney, Australia	**526**	**22.1**	**25.6**	**30.3**
Northern Sweden	647	22.0	25.6	30.4
Moscow (control), USSR	775	21.6	25.6	30.8
Luxembourg Province, Belgium	955	21.7	25.6	30.8
Moscow (intervention), USSR	1,145	21.8	25.7	30.4
Budapest, Hungary	592	21.3	25.8	30.8
Vaud / Fribourg, Switzerland	619	22.1	25.9	30.3
Brisbane, Australia	**234**	**22.4**	**25.9**	**30.5**
Berlin-Lichtenberg, GDR	525	21.9	25.9	30.6
Canberra, Australia	**308**	**22.4**	**25.9**	**31.1**
Newcastle, Australia[(a)]	1,219	22.2	26.0	30.8
Ghent, Belgium	425	21.8	26.1	30.4
Pecs, Hungary	608	21.3	26.1	31.6
Rhein-Neckar Region, FRG	1,186	22.4	26.2	30.8
Adelaide, Australia	**578**	**22.1**	**26.2**	**31.0**
Melbourne, Australia	**253**	**22.4**	**26.2**	**32.2**
Perth, Australia	**296**	**22.2**	**26.3**	**31.1**
Friuli, Italy	715	22.3	26.3	31.3
Hobart, Australia	**327**	**22.4**	**26.3**	**31.4**
Charleroi, Belgium	276	22.5	26.3	31.5
Kuopio Province, Finland	976	22.1	26.4	31.6
Warsaw, Poland	1,309	22.1	26.4	31.7
Catalonia, Spain	397	22.0	26.5	30.3
Turku / Loimaa, Finland	1,202	22.5	26.5	31.6
Novi Sad, Yugoslavia	606	22.0	26.7	31.2
North Karelia, Finland	1,146	22.6	26.7	31.7
Augsburg (urban), FRG	710	23.2	26.8	31.3
Ticino, Switzerland	781	22.7	26.8	31.8
Czechoslovakia	946	22.9	27.1	32.4
Malta	644	22.5	27.1	32.7
Augsburg (rural), FRG	839	23.4	27.3	31.9
Bas-Rhin, France	663	22.8	27.3	32.5
Kaunas, USSR	728	23.2	27.5	32.1

(a) WHO MONICA collaborative centre, 1983 data. Not part of 1989 Risk Factor Prevalence Study.

Sources: WHO MONICA Project 1989
Australian Institute of Health and Welfare

Table 4.32: Body mass index, age-standardised percentiles for Australian capital cities and MONICA Project centres, females aged 35–64 years, 1978–1989

		Percentiles (kg/m²)		
Population	*No. of observations*	*10th*	*50th*	*90th*
Glostrup, Denmark	1,360	20.1	23.5	30.0
Stanford, USA	520	19.7	23.5	31.8
Goteborg, Sweden	560	20.2	23.6	29.6
Haute-Garonne, France	644	20.0	23.6	30.2
Auckland, New Zealand	568	20.2	23.7	29.5
Darwin, Australia	**308**	**19.8**	**23.7**	**31.0**
Sydney, Australia	**563**	**20.0**	**23.8**	**31.4**
Beijing, China	641	19.8	23.9	29.5
Vaud / Fribourg, Switzerland	569	20.1	24.0	30.8
Iceland	704	20.5	24.2	30.5
Ticino, Switzerland	769	20.2	24.2	31.2
Perth, Australia	**305**	**20.7**	**24.2**	**31.5**
Rhein-Neckar Region, FRG	1,292	20.4	24.3	30.7
Brisbane, Australia	**276**	**20.3**	**24.3**	**31.2**
Brianza Area, Italy	632	20.1	24.3	31.5
Newcastle, Australia(a)	1,245	20.4	24.5	31.5
Canberra, Australia	**313**	**20.5**	**24.5**	**31.5**
Northern Sweden	611	20.6	24.7	31.5
Berlin-Lichtenberg, GDR	562	20.8	24.7	32.0
Belfast, Northern Ireland	924	20.6	24.8	31.4
Hobart, Australia	**332**	**21.0**	**25.0**	**31.8**
Augsburg (urban), FRG	677	21.1	25.1	32.1
Luxembourg Province, Belgium	941	20.7	25.1	32.4
Adelaide, Australia	**565**	**21.1**	**25.1**	**32.9**
Turku / Loimaa, Finland	1,282	21.0	25.2	31.4
Ghent, Belgium	348	20.8	25.2	32.5
Melbourne, Australia	**268**	**21.0**	**25.4**	**32.5**
Budapest, Hungary	580	20.7	25.5	32.4
Glasgow, Scotland	482	20.8	25.5	32.4
Friuli, Italy	726	21.3	25.6	32.6
Bas-Rhin, France	713	21.1	25.6	34.2
Augsburg (rural), FRG	852	21.5	25.8	33.2
Kuopio Province, Finland	990	21.7	25.9	32.7
Charleroi, Belgium	247	20.9	26.0	33.6
North Karelia, Finland	1,239	21.6	26.2	33.6
Catalonia, Spain	389	22.1	26.3	33.4
Pecs, Hungary	619	20.5	26.4	33.8
Warsaw, Poland	1,337	21.7	26.8	34.3
Czechoslovakia	987	22.3	27.2	34.9
Tarnobrzeg Voivodship, Poland	1,472	21.7	27.3	34.5
Novi Sad, Yugoslavia	576	22.6	27.4	34.9
Moscow (control), USSR	650	22.7	27.8	36.0
Moscow (intervention), USSR	1,218	22.1	28.0	34.3
Malta	680	22.0	28.6	36.5
Kaunas, USSR	735	23.4	29.3	36.5

(a) WHO MONICA collaborative centre, 1983 data. Not part of 1989 Risk Factor Prevalence Study.

Sources: WHO MONICA Project 1989
Australian Institute of Health and Welfare

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Part 2

Health statistics in Australia

Health statistics: sources, developments and deficiencies

1 Introduction

The Australian health care system costs about $31 billion annually, and costs are rising (see Section 3.1, page 92). Health care is also increasing in complexity. Decision makers and health managers at all levels require reliable and timely information to enable them to formulate policies, plan and manage services, and assist them in making difficult choices between competing demands for resources. The availability of, and access to, health statistics and other health information is essential for the evaluation of current approaches; and essential also to make them more equitable, appropriate and efficient. As well, the public is entitled to information on how health resources are used, and the results of that expenditure. For all these purposes, health statistics are essential (AIH 1991).

Health statistical information arises from many sources, and its collection is a complex and costly process. Most data are derived from the health infrastructure provided by local, State, Territory and Commonwealth governments, and the health services provided by the private sector. Other information about health is derived from the collections of vital statistics (births and deaths) maintained by State and Territory Registrars of Births, Deaths and Marriages and compiled by the Australian Bureau of Statistics. Some statistical collections are by-products of administrative data collections, while others are specifically collected to monitor health status, health risk factors, health services, health technology and health expenditure. Many of the data are collected as a result of legislation or regulation, while some are collected on a voluntary basis. National data are often an aggregation of State and Territory data, made possible as a result of formal and informal agreements between the Commonwealth and States and Territories.

Developments in existing data collections are often the result of data users requesting changes to improve quality, consistency and coverage, while new collections are initiated to meet the needs of administration, planning and research. Changes to existing data collections may also be driven by changing classification standards or the desire to match or link data with other collections.

Institutions, researchers, planners and service providers have a role to play in the determination of the structure of the health data collected. Some of these data collectors and users make their views known through membership of committees which determine data collection standards, policy, coverage, timeliness and methods, while others act independently.

This chapter provides a national overview of health statistical information. Responsibility for the identification of national statistical needs, and for recommending priorities, lies with the National Committee on Health and Vital Statistics (NCHVS) (see Section 2). The following section considers the components recommended to be part of a National Health Information Agreement and Strategy.

At a national level, four agencies—the Australian Institute of Health and Welfare, the Australian Bureau of Statistics, the Commonwealth Department of Health, Housing and Community Services and Worksafe Australia—have responsibilities for the development of health statistics. The nature and responsibilities of these agencies are summarised briefly in Section 4.

The remainder of the Chapter outlines sources of health statistical information in Australia, notes key recent developments and summarises identified gaps and deficiencies. This material is divided into four sections—an introductory section and sections devoted to health statistical information on health status and risk factors; health care funding, resources and utilisation; and five special population groups.

2 National Committee on Health and Vital Statistics

At a national level, the Australian Institute of Health and Welfare's (AIHW) National Committee on Health and Vital Statistics (NCHVS) is responsible for the identification of needs for national health-related statistics and for recommending priorities. Membership of the Committee, which was established to canvass expert opinion and provide leadership in the development of health related statistical collections, is:

- Chairperson, appointed by the Institute;
- three nominees of AHMAC;
- a nominee of the Australian Bureau of Statistics (ABS);
- a nominee of the Commonwealth Department of Health, Housing and Community Services (HHCS);
- a nominee of Worksafe Australia;
- a nominee of the Public Health Association of Australia; and
- a nominee of the Consumers Health Forum of Australia.

In February 1991, to assist NCHVS in identifying national health information needs and establishing priorities, the Institute organised a Forum entitled *Priorities for national health statistics*. Approximately 120 epidemiologists, statisticians, health service researchers, health professionals, government administrators, and representatives from a variety of government and non-government organisations in all States and Territories attended the two-day Forum held in Canberra.

In preparation for the Forum, the Institute sought submissions from specific agencies and individuals, placed advertisements in national newspapers, and, in cooperation with the Public Health Association of Australia, conducted public consultations in capital cities. Over 100 submissions were received.

Aided by a number of commissioned background papers, and summaries of the submissions and public consultations, the Forum considered the current state of health statistics in Australia, identified gaps and deficiencies, and developed an integrated package of recommendations to improve the nation's health information systems (AIH 1991).

3 Towards a National Health Information Agreement and Strategy

The key recommendation of the Forum on *Priorities for national health statistics* was to develop a National Health Information Agreement and Strategy (AIH 1991). Initially there would be a need for the Commonwealth, State and Territory governments to agree on mechanisms to improve the flow of data, use existing data more effectively and address data development issues. In the process, the interests and needs of the non-government sector—both private and community—would need to be addressed.

The Forum also noted the need to:

- educate the Australian community about the need for, and benefits of, improved health statistical systems;
- increase the number of people with the expertise to analyse and interpret health statistics;
- give early attention to meeting identified gaps and priority needs in the Australian health information system; and
- improve access to, and dissemination of, health statistics.

As identified by the Forum, the key components and objectives of a National Health Information Agreement and Strategy would be to:

- make better use of existing data
- link existing data sources
- enable datasets to be more widely available for epidemiological and health services analysis and research
- free the flow of information between the Commonwealth, States and Territories (this may require appropriate incentives, including financial incentives)
- improve access to existing databases by local service providers and community groups
- develop a conceptual framework and strategy to document current activities, and identify and deal with major gaps in data coverage, including the development of incentives
- develop the analytical methods needed to address related policy relevant issues, such as equity and access.

The Forum recommendations were accepted by NCHVS and the Institute. Following consultation with Commonwealth, State and Territory authorities, and ABS and Worksafe Australia, the proposal for the development of a National Health Information Agreement and Strategy was accepted at the March 1992 meeting of AHMAC. The seven main objectives of the Agreement would be to establish:

- *national priorities for health information*
- *national health data standards and classifications*—including data quality
- *guidelines and consultative mechanisms*—for setting up national data collections, promoting the more effective use of existing data, and addressing major data gaps
- *guidelines for combining datasets*—subject to confidentiality and privacy requirements
- *rules relating to data access and acknowledgement*—applicable to all users (owner and non-owner)
- *principles relating to charging policies*—for data capture, provision, manipulation and access

- *the basis for the incorporation of other health and health-related data*—from the private sector and public sectors other than the health sector.

Development of a draft Agreement, to be considered by AHMAC in March 1993, is being undertaken by a Commonwealth, State and Territory Task Force convened by AIHW. In formulating the Agreement, which will include an implementation plan and processes for review, the Task Force will be consulting with a range of community, professional and private sector groups.

4 Major agencies involved in the development of national health statistics

As noted in the Introduction, sources of health statistical information are many and varied, but responsibility for the development of national health statistics lies largely with four agencies—AIHW, ABS, HHCS and Worksafe Australia. A number of other agencies (such as the Health Insurance Commission and the Department of Veterans' Affairs) are also involved in the collection of national statistics.

Of the four agencies, AIHW, ABS and Worksafe Australia are statutory bodies whose functions, responsibilities and constraints are laid down in enabling legislation. On the other hand, the scope of HHCS, which has both policy and program responsibilities, is less rigorously defined by legislation.

Although it would appear that the roles of these agencies are distinct, in practice there are some overlapping areas, which are addressed through mechanisms such as regular coordination meetings and cross-representation. The heads of ABS and HHCS are members of the Board of the Institute and all agencies are represented on NCHVS. As well, the Chairman of AIHW is in his own right a member of the Australian Statistics Advisory Council (ASAC). Regular coordination meetings are held between AIHW and ABS, and between AIHW and HHCS.

4.1 Australian Institute of Health and Welfare

On 4 May 1992, the roles of the Australian Institute of Health (AIH) as defined originally in the *Australian Institute of Health Act (1987)* were expanded to include the development of welfare statistics. The agency was renamed the Australian Institute of Health and Welfare (AIHW). Under the amended legislation, the Institute's functions are to:

- collect and assist in the production of health- and welfare-related information and statistics;
- conduct and promote research into the health of Australians and their health services;
- develop statistical standards relevant to health, and to health and welfare services;
- publish methodological and substantive reports on work carried out by or in association with the Institute;
- undertake studies into the provision and effectiveness of health services and technologies; and
- make recommendations on the prevention and treatment of diseases and the improvement and promotion of health and health awareness of the people of Australia.

In addressing its responsibilities, the Institute now has three health-related research divisions and a welfare services statistical division located in Canberra, four external units, and has developed formal collaborative arrangements with three other agencies. The following discussion relates mainly to the Institute's functions in the area of health statistics and not to the recently added function in welfare statistics.

Health Monitoring Division

This Division focuses on monitoring and evaluating the health of Australians and selected population sub-groups. It also seeks to improve the range of collections and the quality of statistical information available, and provides the contact point for contributions to international health status data collections.

Health Services Division

The Health Services Division is responsible for producing and analysing national data and information on the provision and use of health services in Australia, and the resources needed to support them. Priority has been given to developing collections that describe the infrastructure of the health system, including expenditure on health, the health labourforce, and the cost and use of institutional care and medical services.

Health Technology Division

This Division undertakes assessments of, and provides advice on, the role, distribution, costs and effectiveness of health care technologies. Health technologies are taken to include activities and procedures that involve the use of devices or equipment to prevent, diagnose, treat or cure disease and disability. The Division undertakes this role by supporting advisory bodies, preparing reports based on published data and expert opinion, collecting and analysing primary data, and developing databases.

Welfare Division

The recently established Welfare Division has responsibility for the production and analysis of national data on welfare and community services, and assisted housing. Initially, priority issues include aged care, children's services (including welfare programs), programs for people with disabilities, and assisted housing.

Dental Statistics and Research Unit

The AIHW Dental Statistics and Research Unit (DSRU) is located at the University of Adelaide's Department of Dentistry. The Unit was established in 1988 to improve the range and quality of statistics on the dental labourforce, dental practice, dental health status and use of dental services.

National Injury Surveillance Unit

The AIHW National Injury Surveillance Unit (NISU) is active in all aspects of public health surveillance of injury—data collection, analysis and dissemination, and the development of surveillance methods. In addition, the Unit promotes the development of public health injury prevention activities by providing resources (such as a handbook on injury prevention), organising conferences, and encouraging training, research and inter-sectoral collaboration.

The Unit has academic affiliation with the Flinders University of South Australia, and is located adjacent to the University campus.

National Reference Centre for Classification in Health

The Institute's newest external unit was established in February, 1992. It was formed as a result of the World Health Organization (WHO) appointing the AIHW as a collaborating centre for International Classification of Disease, and will provide leadership in health statistical classification in Australia.

The Centre, located at the Queensland University of Technology, has close links with Queensland Health and ABS's Queensland office, which is expected to become the location for centralised coding of mortality within the Bureau.

The Centre will have a primary role in introducting the Tenth Revision of the International Classification of Diseases into Australia and the Western Pacific Region from 1993. The Centre will collaborate with other areas of the Institute, other agencies and individuals in work relating to disease classification, and with ABS in relation to its mortality coding activities. An important and long overdue activity will be the development and maintenance of standard guidelines for hospital coding practice throughout Australia.

It is anticipated that the Centre will eventually provide consultancy services, undertake research projects, and design and present training courses, workshops and seminars on the use and application of disease classification systems.

National Perinatal Statistics Unit

The AIHW National Perinatal Statistics Unit (NPSU) is located at the University of Sydney. The core functions of the Unit include the collection and analysis of mortality and morbidity (including congenital malformations) data relating to the perinatal period, the provision of data on birth defects and congenital malformations to international data collections, and dissemination of information through a consultation service and the provision of routine reports.

AIHW collaborating centres

The Institute is developing a network of collaborating centres as a means of expanding its capacity to fulfil its statutory functions. Both established and developing groups whose work can contribute to the Institute's objectives may qualify for designation as an AIHW Collaborating Centre. Collaborating centres may contribute technical expertise, information, services, research and training to assist the Institute. The Institute has already entered into collaborative arrangements with three institutions, one of which is collaborating in the area of health statistics.

Collaborative work in the area of health services statistics is being undertaken between the University of Newcastle's Hunter Health Statistics Unit and the Institute. The work is designed to increase the use and accessibility of hospital separation data and other hospital summary data. A second project is the development of strategies for national monitoring of diseases of the circulatory system.

Other collaboration

As well as the formal arrangements outlined above, the Institute collaborates closely with the Australian National University's National Centre for Epidemiology and Population Health (NCEPH), which has an academic program of research and training in public health, health of older people, AIDS epidemiology, injury prevention, cancer and heart disease prevention, and the prevention of drug abuse.

The collaboration between NCEPH and the Institute includes joint projects, a common seminar program and joint appointments. It is anticipated that NCEPH researchers will assist in interpreting and analysing various databases developed by AIHW.

Review of the Institute

In March 1991, the Institute was reviewed by a specially convened committee. In its report, the AIH Review Committee (1991) noted the need for delineation of responsibilities of the Institute, ABS and HHCS in the collection of health data, and recommended greater utilisation of existing data collections and dissemination of results. The latter would require record linkage and cooperation between the Institute, Commonwealth, State and Territory agencies, and health care providers in the private sector. The framework for these developments was seen to be the National Health Information Agreement and Strategy. The Institute has already responded to these recommendations through internal strategic changes and the involvement of external data collection bodies.

4.2 Australian Bureau of Statistics

ABS is the central statistical authority for the Commonwealth Government and, under arrangements between the Commonwealth and the States and Territories, provides statistical services for their governments.

Under the *Australian Bureau of Statistics Act 1975*, the Bureau has responsibility for:

- the collection, compilation, analysis and dissemination of statistics and related information;
- ensuring coordination of the operations of other official bodies in the area—to avoid duplication, attain compatibility and encourage maximum utilisation of statistics;
- developing and maintaining standards for statistical collections; and
- providing international liaison in relation to statistical matters.

In the area of health statistics, ABS is responsible for providing and supporting the production of statistical information on the health status of Australians (including disease prevalence and causes of death, and lifestyle and risk factors associated with their health), their use of and need for health services, the cost of health services and the health labourforce.

ABS addresses these responsibilities through the annual causes of death and perinatal deaths collections, and the five-yearly *Census of Housing and Population*. It also undertakes a variety of statistical surveys, including periodic national health surveys, surveys of disability and ageing, and a biennial survey of private health insurance. In late 1992, it will also introduce an annual survey of private hospitals in Australia. The results from this survey, when combined with information collected from the public sector by the Institute, will provide the first set of national statistics relating to hospitals on a regular basis. Information about this and other collections undertaken by ABS is summarised in the later sections of this chapter.

In the health sector, ABS recognises that it is only one of a number of agencies with statistical responsibilities. It does not see itself as the prime agency responsible for the production of national health statistics, but one which 'seeks to contribute according to its comparative advantages' and 'still retains a responsibility for coordinating the overall statistical service of which health statistics forms a part' (ABS 1990b:94).

ABS looks to the Institute, particularly through NCHVS, for leadership and advice on statistical priorities in health and for help in defining its future activities.

As noted above, there are a number of mechanisms by which the activities of AIHW and ABS are coordinated at senior levels. As well, there is a Coordination Committee through which Bureau and Institute staff maintain close contact in regular meetings, where matters of common interest are reviewed and proposals to improve coordination and liaison are developed.

In pursuing its role of analysing data relating to health policy, the Institute will continue to produce special reports based on ABS data, and joint projects will at times be undertaken. Examples are the development of an inventory of health data sources (van Ommeren, Merton, Short 1991), and current work towards a joint Aboriginal health publication.

4.3 Commonwealth Department of Health, Housing and Community Services

HHCS has a significant role in health and welfare statistics, particularly through its responsibility for administrative data collections. Of special importance are the data from Medicare and the Pharmaceutical Benefits Scheme, probably the two largest databases in the field of health. Other administrative collections include those related to residential care for older people, assistance for people with disabilities, health promotion and disease prevention, medical and health research, therapeutic goods, housing assistance, the Home and Community Care (HACC) Program and the National Campaign Against Drug Abuse (NCADA).

HHCS also collects health statistics in a number of areas which do not derive from its programs. These include the data collection, collation and dissemination roles of the Communicable Disease Section in the Communicable Disease Network Australia, and of the National Drug Abuse Information Centre in the National Drug Abuse Data System.

Another way that HHCS contributes to health information is through the activities of the National Health and Medical Research Council (NHMRC) and a number of other research-funding mechanisms. Although most of the work supported is of a research nature, some is in the area of health statistical information.

Information about some of the collections undertaken by HHCS is included in the later sections of this chapter.

As with coordination between AIHW and ABS, there are a number of mechanisms by which the health statistical activities of AIHW and HHCS are coordinated. As well as the mechanisms already noted, there are regular high-level coordination meetings between the Department and the Institute.

4.4 Worksafe Australia

Worksafe Australia has primary responsibility for the development of national occupational health and safety statistics. This role involves assuming responsibility for:

- coordination, including consultation and representative input to major statistical developments;
- development, maintenance and support of statistical standards and classifications; and
- dissemination and analysis of national statistics.

In the area of statistics, Worksafe Australia's two main functions are to:

- ensure the availability of relevant, timely and comparable national statistics on occupational health and safety; and
- facilitate standardised collection and compilation of information, particularly at the workplace.

5 Sources of health statistics in Australia

Sources of health statistics are wide and varied. Many of the data collections used for health statistical purposes are the by-product of administrative collections (for example, deaths and hospital inpatient episodes). Other collections are specifically designed to monitor disease prevalence, incidence or outcomes, and cost of health care interventions.

Because of the cost of data collection, analysis and dissemination, most large health statistical collections are the responsibility of government agencies (or of agencies funded by government), but private organisations also produce administrative by-product statistics and gather information for their own use.

With the States and Territories having the primary responsibility for health care delivery (and for the registration of births and deaths), a large proportion of the health data collected is at a State or Territory level. Some of these datasets are collated at a national level by agencies such as ABS and AIHW, with subsets of original collections standardised for interstate or regional comparisons (these data subsets are often referred to as minimum datasets). The collection of information is often structured to meet recognised international standards (for example, WHO's International Classification of Diseases (WHO 1977)).

As well as large scale data collections, there are many small data collections which have been set up to monitor particular aspects of health or health care provision. Most of these smaller collections are not discussed here, but have been summarised in a publication produced as a result of a joint Institute–ABS project (van Ommeren, Merton, Short 1991). The publication identifies the agency responsible for the data collection and release, describes characteristics of the dataset, and lists published output.

Apart from specific collections, much useful information about health and health services is produced from special studies undertaken by government and other organisations, tertiary institutions, and individuals.

The following sections of this chapter, which summarise current sources of health statistics in Australia, draw heavily on:

- the report of the Forum on *Priorities for national health statistics* (AIH 1991);
- major reviews by ABS (1990b, 1990c) of health and welfare statistics and its role in the fields;
- the joint Institute–ABS review of health statistical collections (van Ommeren, Merton, Short 1991); and
- annual reports of health agencies and ad hoc reviews of health data collections.

Important developments in specific collections are noted, and, largely based on the Forum's deliberations, identified gaps and deficiencies in data sources are summarised.

Key health data collections are considered in two main groups:

- *Health status and risk factors*—births and pregnancy outcome, deaths, morbidity, disability and handicap, diet and nutrition, physical activity, weight and height, non-pharmaceutical drug use, and immunisation status; and
- *Health care funding, resources and utilisation*—expenditure, private health insurance, health labourforce and institutional facilities, hospital and institutional services, professional services, health technologies and pharmaceutical drugs.

In the final section, attention is directed at health statistics for five special population groups:

- *women*
- *Australian Aborigines and Torres Strait Islanders*
- *ethnic groups*
- *older people*
- *people with disabilities and handicaps.*

Of course, not all sources fit into a structure like the one used in this chapter to group health statistics. Some of these aspects are considered here.

Health outcome measures

One area highlighted by the Forum was the need for more appropriate health outcome measures. Most health services are not life-saving, but rather are mainly directed at reducing pain, improving function, and providing care where no cure is possible. In countries like Australia, most health status indicators (such as mortality rates) provide little real measure of the impact of health services on health. There is a need to develop measures that do reflect the impact on the wellbeing of the community, and permit more rational allocation of resources.

In the United States, the Agency for Health Care Policy and Research has funded 10 Patient Outcome Research Teams (PORTs) to investigate the effects of health services on the welfare of patients. These could lead to the development of measures of outcomes that could be valuable in assessing the effectiveness and efficiency of health services. Such outcome measures are needed for health care in both primary care and institutional settings.

The importance of appropriate outcome assessment as an integral part of a national health strategy was discussed at the March 1992 meeting of AHMAC, which set up a small working group to consider an outcomes approach to health funding. The working group has been asked to develop an outline for discussions on key issues by April 1993.

Indicators of quality of care

An issue related to health outcomes is the need for indicators of quality of care. There is evidence that avoidable poor quality care costs Australia hundreds of millions of dollars annually, as well as adversely affecting the lives of thousands of people (Harvey 1991).

Data on primary health care

The Forum noted that statistical collections for the primary health care system, a major and crucial component of the Australian health care system, were fragmented and lacked a conceptual framework (AIH 1991). A range of data are available, but there is a need to develop a statistical framework within which a national database for primary health care could operate.

The Forum recommended that high priority should be given to the development of information collection strategies. These collections should cover all the different sectors involved in primary health care, and should draw upon data available through community profiles, client records, and on service activity, the labourforce, and the level of resources (including funds). A national collection of sentinel primary care data should be considered.

Equity and access

The existence of wide differentials in health status and risk factors between population sub-groups characterised by age, sex, Aboriginality, socioeconomic status, country of origin and place of residence raises important equity issues, in terms both of the social factors contributing to these differentials and of access to health services.

The Forum noted the need for data on a range of sociodemographic variables. They are needed to gain a greater understanding of the problem, to explore possible solutions, and for information about barriers limiting access to health services.

Monitoring health goals and targets

The setting of national health goals and targets has implications for the range of health information collected and how it is collated.

Over the past year, the work of the Health Targets and Implementation Committee (HTIC) in setting general goals and targets has been extended by the development of more specific targets (Nutbeam et al. 1992). As noted by HTIC, the setting of targets within the framework of national health policy provides 'a set of standards against which progress over the next decade might be assessed' (HTIC 1988:8).

Based on experience in the United States, the adoption by Australia of national goals and targets would necessitate the development of additional health indicators to monitor progress towards targets. In the United States, there were baseline data available in 1990 for only 77 per cent of the targets set for achievement by the year 2000 (US Department of Health and Human Services 1990). It is likely that even less baseline data would be available in Australia.

6 Statistics on health status and risk factors

6.1 Births and pregnancy outcome

Information about births and pregnancy outcome comes from two main sources. Registration of births is the responsibility of Registrars of Births, Deaths and Marriages in each State and Territory, and is based on data provided on an information form completed by one of the parents. These data are collated and disseminated by ABS in national, State and Territory bulletins.

Partly in response to limitations in the data collected by this process, which are not as comprehensive as those collected by most comparable countries (NCHS 1992), State and Territory health authorities have established parallel collections. These maternal/perinatal collections provide information about the pregnancy, labour and puerperium, as well as a variety of health-related information about the baby. Most States and Territories publish annual reports. The possibility of linking the maternal/perinatal collections with birth registrations is being investigated.

A minimum dataset from the maternal/perinatal collections is being reviewed currently by the National Perinatal Data Advisory Committee, which has representation from all State and Territory health authorities and from interested consumer and professional groups.

At present, not all home births are notified to the State and Territory maternal/perinatal collections and identification of these births may not be complete. However, Homebirth Australia, a voluntary consumer organisation, and NPSU have collected data and published a report on home births in Australia for the period 1985–1987. A further report based on the period 1988–1990 is scheduled for publication in 1992.

To supplement the information on congenital malformations which can be derived from the maternal/perinatal collections, New South Wales, Victoria, Western Australia and South Australia have established birth defects registries, which collect information from a variety of sources—midwives, hospitals, child health nurses, medical practitioners, special centres and parents. NPSU maintains a monitoring system for congenital malformations with data derived from State and Territory data collections, publishes quarterly and annual reports, and contributes national data to the International Clearinghouse for Birth Defects Monitoring Systems.

A population-based register of all pregnancies in Australia and New Zealand resulting from in-vitro fertilisation (IVF) and other methods of assisted conception was commenced in 1983 by NPSU in collaboration with the Fertility Society of Australia and individual IVF units. An annual report is produced.

Gaps and deficiencies

The existence of two data sources on births creates some problems, and the possibility of linking the maternal/perinatal collections with birth registrations is currently being investigated.

6.2 Deaths

The primary source of mortality statistics is the death registration system maintained by each State and Territory Registrar of Births, Deaths and Marriages. Death data are obtained from two sources—information provided by a relative or another person acquainted with the deceased (or by an official of the institution where the death occurred), and that supplied by a medical practitioner as to the cause of death.

Death data are provided by the State and Territory Registrars to ABS, where the causes of death are coded according to the ninth revision of the International Classification of Diseases (WHO 1977). The Registrars also provide deaths data to the AIHW for its mortality surveillance system and the National Death Index (NDI), currently being established.

The Institute has received from each of the State and Territory Registrars of Births, Deaths and Marriages full deaths information for the period 1980–1990, and will receive further information on an annual basis. As well as full details about the deaths, the mortality database contains selected demographic information.

The database currently holds 1.2 million records and approval has been given by the Institute's Ethics Committee and those bodies responsible for privacy and ethics in each of the States and Territories for its use in a number of Institute projects. Information from the mortality database is extracted on an annual basis for WHO. Data in an appropriate form can also be supplied in response to public enquiries on an ad hoc basis.

Several jurisdictions have already supplied data for the NDI to the Institute with others expected to do so in the near future. The date from which data are available for use varies between States and Territories, but it is expected that a national index from the early 1980s should eventually be available.

Once established, the NDI will yield considerable savings in time, expense and effort by enabling epidemiologists and other health researchers to determine readily whether subjects of their research have died and, if so, the State or Territory holding the relevant death record. Development and operation of the NDI will be a cooperative arrangement among the State and Territory Registrars of Births, Deaths and Marriages; ABS, which codes causes of death; and the Institute. The development will be a complex task, but establishment of the Index will be a significant milestone for epidemiological research in Australia.

Key developments

- Establishment of the Institute's mortality surveillance system.
- Progress on the NDI with several jurisdictions having already supplied data.

Gaps and deficiencies

Efficient use of deaths data is important for any health information system. Standardisation across States and Territories and improved access to the Registrars' data are essential prerequisites to improving the system. Examples of needed improvements are:

- collection of Aboriginality and occupation data
- collection of date of birth rather than age in death records
- deaths from external causes to include pathophysiological cause as well as external cause
- circumstances of fatal injury, as proposed for ICD-10, to be included.

6.3 Morbidity

Morbidity in the community

Important sources of morbidity in the community are population and ad-hoc surveys.

Most of the major population health surveys have been conducted by ABS. Since 1977, ABS has conducted three general health surveys, and a number of surveys examining specific health issues. Details of the specific surveys are included under the relevant headings in this section.

ABS's *1977–78 Australian Health Survey* collected information on illness experience, days of reduced activity, consultations with medical, dental and other health practitioners, and the use of medications. In addition to this information, the Bureau's *1983 Australian Health Survey* also asked respondents about episodes of hospitalisation and accidents experienced.

The most recent general survey, the *1989–90 National Health Survey* (1989–90 NHS), is the first of a series of five-yearly surveys. Its content is broader than those of ABS's previous health surveys and is intended to provide national benchmark information on a range of health issues, and enable trends over time to be monitored. The 1989–90 NHS collected information about illness and injury experience, episodes of hospitalisation, medical consultations, risk factors (including immunisation levels) and a variety of women's health issues. Results from this survey have been used in this publication, and have been presented in a series of ABS reports. The next National Health Survey is planned for 1994–1995.

Some surveys, usually addressing specific health issues, have also been conducted under the auspices of the State and Territory health authorities.

Population-based sample surveys are also conducted on specific health topics by non-government organisations and academic institutions. An example is the National Heart Foundation's *Risk Factor Prevalence Study*, which has involved three surveys—in 1980, 1983 and 1989. This series of cross-sectional surveys undertook measurements on blood pressure, blood lipids, height and weight, and asked questions on smoking, alcohol consumption, exercise, dietary behaviour and use of oral contraceptives. Much of the information gained from these surveys has been presented in this report, and in NHF publications. The next survey is scheduled for 1994.

The Institute will analyse trends over the three RFPS surveys already conducted. The study has been designed to examine changes in risk factor prevalence over the nine years and compare coronary risk among population centres and social sub-groups.

Participants in the 1989 RFPS also contributed a blood sample for biochemical determination of their iron status. Plasma samples were analysed for iron, ferritin and transferrin which together provide an indicator of iron deficiency. This information, for adults living in the eight capital cities, complements similar data collected in 1985 on iron status of schoolchildren (English, Bennett 1990).

Gaps and deficiencies

Ideally, physical measurements of health status and health risk factors should be undertaken in surveys simultaneously with the collection of interview data, as is done in the United States. However, ABS's legislation does not provide for the conduct of physical examinations. There is a need to explore ways in which this could be accomplished in Australia.

There is a need also for health status data systems to provide a wide range of health status indicators at national, State and Territory levels and especially at the local area level for the planning of services, programs and research. The inclusion of summary health status data in a wider range of population surveys may help to achieve this objective. This is being examined by ABS. At the same time, a standard set of key socioeconomic and demographic questions and indicators relating to access and equity should be developed for inclusion in health collections. This would allow data to be related to the same population denominators.

Apart from information collected through the large population surveys, there is a general lack of information concerning community morbidity. A potential source of this type of information is the Health Insurance Commission (HIC) system of paying benefits for medical services. Currently HIC collects no diagnostic information and little other information relating to health. With around 150 million consultations with medical practitioners a year there is potential for collecting such information. A number of Canadian provinces collect diagnostic information on claims for medical benefits, and the increasing use of computers in medical practitioners' surgeries and the development of networks to serve this market makes the collection of such data increasingly feasible and economic.

The Forum also suggested examining the feasibility of longitudinal and/or cross-sectional studies of voluntary cohorts of Australians who are willing to permit their census records to be retained and/or linked to other health-related records across time.

Hospital morbidity collections

Potentially useful information on sickness and disease is available through the hospital morbidity collections maintained by all State and Territory health authorities. These collections, based on inpatient episodes, include sociodemographic, diagnostic, procedural and duration of stay information.

In most States and Territories, ABS has some involvement in the processing or publishing of the hospital morbidity collections. Until the late 1970s, ABS had almost sole responsibility for the processing of the collections, but since then has diverted resources from data capture and coding of such collections into health surveys (ABS 1990b). The Institute currently receives hospital morbidity data from most State and Territory health authorities, and provides assistance to researchers wanting access to this information. The Institute is encouraging greater uniformity of existing collections through the National Minimum Data Set for Institutional Health Care.

Gaps and deficiencies

The Forum recommended that all hospital morbidity collections should include data from private hospitals. Data are also required on non-inpatient (including accident and emergency) encounters.

Specific health conditions

Diseases of the circulatory system

Statistics concerning diseases of the circulatory system, which include heart disease, stroke and a number of other conditions, are available from several sources. Information is available through the deaths and hospital morbidity collections, and specific monitoring of heart disease has been undertaken by the MONICA projects in Newcastle and Perth (under the auspices of WHO and funded by NHMRC and NHF).

NHF has also conducted the *Risk Factor Prevalence Study*, involving surveys in 1980, 1983 and 1989. The surveys measured the prevalence of a number of coronary heart disease risk factors (such as blood lipid levels). Similar information was also collected in a self-reported manner (no physical measurements were made) by ABS's 1989–90 NHS.

NHF also maintains a national cardiac surgery register and a national coronary angioplasty register.

Cancer

As well as the information available through the deaths and hospital morbidity collections, each State and Territory has a cancer registry which collates, analyses and publishes information on cancer derived from a number of sources. Incidence information is collected from pathologists, hospitals, oncology clinics, nursing homes, clinicians and other sources, and deaths information is provided by the Registrar of Births, Deaths and Marriages in each jurisdiction. The collection of cancer information is covered by legislation in all States and Territories except Tasmania and the Australian Capital Territory, where voluntary arrangements exist. Legislation is currently being drafted for these two registries.

Information provided by each cancer registry is collated into a national database by the Institute's National Cancer Statistics Clearing House (NCSCH). Development of the NCSCH has progressed rapidly in the last year, with agreements now reached with all State and Territory cancer registries to supply cancer registration data on a continuous basis.

National data for the period 1982–1985 has been processed and inter-state duplicate registrations resolved using specialised matching routines. Publication of national data for 1983, 1984 and 1985 is expected to be finalised by around the middle of 1992.

A dataset of melanoma skin cancers for 1989 has been compiled by the Clearing House, the results of which will be published jointly with the Australasian Association of Cancer Registries. Further development of the Clearing House should be rapid, as much of the groundwork has been laid for the routine processing of data—allowing for resources to be devoted to in-depth studies of the database.

An example of the value of special studies in generating health information is a survey of the incidence of non-melanocytic skin cancer (information about which is not collected routinely by cancer registries) (Giles, Marks, Foley 1988). This survey of almost 31,000 Australians was conducted in conjunction with a national omnibus survey by a market research company.

As well as the State and Territory cancer registries, there are some registries focusing on particular cancers or population groups. Examples are the Australian Paediatric Cancer Registry and the mesothelioma register maintained by Worksafe Australia.

Diseases of the respiratory system

Apart from information available through the deaths and hospital morbidity collections, data on diseases of the respiratory system, which include pneumonia and influenza, bronchitis, emphysema and asthma, have been collected as a part of the 1989–90 NHS.

Some of the State and Territory branches of the Asthma Foundation have supported studies of the prevalence of, and mortality from, asthma. NHMRC also funded a study to analyse trends in asthma mortality.

Injury

In recent years, injury has been recognised as a major public health issue, and one offering considerable potential for prevention. Injury was nominated by the National Better Health Program (NBHP) as one of its five priority areas. At national level, surveillance of injury generally is undertaken by the Institute's National Injury Surveillance Unit (NISU). Other agencies focus on particular types of injuries. These include Worksafe Australia (occupational injuries—these are discussed further in 'Occupational health and safety', page 277), the Federal Office of Road Safety (serious and fatal road injuries), the Bureau of Air Safety Investigation (injuries related to air transport), the Federal Bureau of Consumer Affairs (consumer product safety), and the Australian Institute of Criminology (homicide).

NISU supports, and is further developing, the Injury Surveillance Information System (ISIS). Comprising a surveillance method, data specification and software for data entry, coding and analysis, the system is in use for injury surveillance data collection at more than 40 hospital accident and emergency departments in Australia.

Nationally aggregated data from this source, together with data from a variety of other sources, form the basis for a national injury surveillance system being developed by NISU. The Unit offers an injury information service, is participating in a project to improve the utility of coroners' data for public health purposes, and is undertaking a three year program to review and improve road injury information.

Communicable diseases

The States and Territories have primary responsibility for monitoring communicable and notifiable diseases. Under legislation, medical practitioners diagnosing certain conditions are required to notify the health authorities. Each of the States and Territories publish information about these diseases in bulletins and annual reports, and for a number of years HHCS has monitored some communicable and notifiable diseases at a national level.

The Communicable Diseases Network Australia (CDNA) has been established as part of an initiative to improve the surveillance and control of communicable diseases in Australia. The network comprises communicable diseases units of State and Territory health authorities, the Communicable Diseases Section of HHCS, participating microbiology laboratories, medical organisations such as the Royal Australian College of General Practitioners, NCEPH and the Institute. The network's charter is to improve and coordinate communicable diseases surveillance and control nationally.

A coordinating group has been set up in HHCS to improve the flow of information among States and Territories, and to provide a vehicle for assisting in the control of communicable disease outbreaks. CDNA has established a network of sentinel laboratories to notify the outbreak of communicable diseases in Australia. NCEPH is taking a key role in the training of public health professionals in the area of communicable disease control and surveillance. The existing publication *Communicable diseases intelligence* will continue to play a major role in communications within the Network.

Responsibility for monitoring infections with human immunodeficiency virus (HIV) and the acquired immune deficiency syndrome (AIDS) lies with the National Centre in HIV Epidemiology and Clinical Research at the University of Sydney. Based on data obtained by each of the State and Territory health authorities through the notifiable diseases legislation, the Centre maintains a national register of AIDS cases beginning with the first cases of the epidemic in 1982. Information is published regularly in the *Australian HIV Surveillance Report*—a monthly version gives key information and a quarterly supplement provides considerable detail.

In recent years, much has been done to improve the completeness and quality of the statistics, and missing data have been obtained where possible.

Dental health

Dental health statistics are held by several sources. The most recent comprehensive statistics are those collected as part of the *National Oral Health Survey* conducted in 1987–1988 under the auspices of the (then) Commonwealth Department of Community Services and Health. The database is now held by the Institute's DSRU in Adelaide.

DSRU has also taken over responsibility for the national collation and analysis of data on child dental health, which has been collected by the State and Territory Dental Health Services since 1975 when the *Child Dental Health Survey* was initiated as part of the evaluation of the Australian School Dental Scheme.

Following a meeting of representatives of all School Dental Services in November 1988, the survey was redesigned by DSRU to:

- maintain the existing time series of data;
- expand the public health utility of the survey by including relevant demographic variables;

- increase the efficiency of the collection through greater use of sampling strategies and use of optical mark reading technology;
- improve both the frequency and quality of reporting; and
- produce more rigorous and detailed statistical analyses.

By the end of 1989, States and Territories had undertaken training programs for all staff and begun data collection. Data from New South Wales and both Territories are being sent to DSRU for processing and analysis. Other States have assumed responsibility for processing, and forward unit record data for incorporation into the national database. As well as information published by DSRU, some jurisdictions produce separate reports based on their own analyses, or following assistance from DSRU. An example is a report of caries experience of Aboriginal and non-Aboriginal children in the Northern Territory based on the *Child Dental Health Survey* database.

Weighting procedures for national measures of child dental health have been revised by DSRU, allowing national reports to be produced for 1989 and 1990. DSRU has also undertaken an NHMRC-funded longitudinal study to determine the efficacy of fluorides in the prevention of dental caries in children. This work complements the Child Dental Health Survey and has been implemented in South Australia and Queensland with the collaboration of the respective State dental authorities. Data collection began in June 1991. The Unit also provides support to the South Australian Dental Longitudinal Study and to a study of Aboriginal Child Dental Health.

Information on dental health status has also been collected by ABS, most recently in the 1989–90 NHS. An Australia-wide survey of adult dental health status was undertaken in 1979, and a South Australian survey in 1980. In 1983, ABS surveyed the dental health status of Australian children.

Data on specific population groups have been collected by some State and Territory authorities. An example is the survey of the dental health status of South Australian Aborigines, conducted in 1988 by the Aboriginal Health Organisation of South Australia. Queensland Health collects data biennially from hospital dental clinics monitoring the dental health status of those attending and the level of treatment required.

Key developments

- Implementation of the redesigned *Child Dental Health Survey.*

Gaps and deficiencies

Demographic changes and improvements in dental health, decreased dental disease in children, and increased tooth retention in adults have all contributed to the increasing attention being given to adult dental health. However, information on adult dental health is sparse, and there is little information on which to predict trends in many aspects of adult dental health and use of services. More detailed data are required to document dental health problems and access to services among adults, including older adults, and to establish a better understanding of their preventive dental behaviour.

Particular emphasis is required on the analysis of factors which explain the distribution of dental disease and access to dental care, and indicate ways in which these may change under changed conditions. Such data collections are required periodically to establish trends important for long-term planning. In response to requests from the Australian Dental Association and other bodies, DSRU has proposed two new national dental collections—a national dental survey and an adult dental programs survey. Aspects of both surveys are being pilot tested in South Australia in 1992.

Mental health

Mental health statistics at the national level are virtually non-existent at present. Some data are available from hospital morbidity collections, although many people with mental illness are treated in the community, as outpatients or in institutions not included in the morbidity collections. At the State and Territory level, some statistical collections are being maintained and other more extensive collections are being developed.

The National Minimum Data Set for Institutional Health Care, which includes psychiatric patients treated by institutions both as inpatients and non-inpatients, provides a first step towards developing a national information base on mental health.

Gaps and deficiencies

Information on the mental health of Australians is seriously deficient. There is an urgent need for data on the incidence and prevalence of mental health problems in the population, as well as the development of activity level information systems and client level services utilisation systems.

The National Mental Health Policy and Plan, which was endorsed by AHMC in April 1992, recognises the need to develop national mental health data. The Plan outlines a proposal for a national mental health data strategy incorporating a national minimum dataset, with the early publication of benchmark data. It is expected that the development of the data component will be coordinated by a small group operating under the auspices of the AHMAC Working Group on Mental Health.

Occupational health and safety

Information about occupational injuries and diseases is available from several sources—compensation agencies, employers, health institutions, death records, population surveys and hospital morbidity collections. Occupational injuries resulting in an attendance at some emergency hospital facilities are also identified by ISIS, the injury surveillance system coordinated by NISU.

Compensation-based statistics are collected and processed by State and Territory agencies, with ABS assisting in Queensland and Tasmania (formerly, ABS was also involved with other agencies). Because of the lack of national standards, the datasets could not be aggregated to produce national estimates.

Worksafe Australia now has responsibility for national-level monitoring of workplace injuries and has coordinated the development of a national dataset for compensation-based statistics. Publication of national data is expected by around the middle of 1992.

ABS's 1989–90 NHS collected information on injuries by place of occurrence, including the workplace, and the *1988 Survey of Disability and Ageing* noted whether the workplace was responsible for reported disabilities and handicaps.

Key developments

- The development by Worksafe Australia of a national dataset for compensation-based statistics.

Gaps and deficiencies

Worksafe Australia's national dataset for compensation-based statistics will allow the regular production of national statistics, but there are a number of drawbacks, the principal one being that the statistics generated will not cover all work-related injuries. They underestimate the true extent of the problem in that they will exclude:

- cases of temporary disability involving an absence from work of less than one week (five working days);
- injuries to the many workers who are not covered under workers compensation legislation;
- most injuries to the self-employed; and
- cases not claimed or unsuccessful under workers compensation legislation.

Workers compensation systems are generally a poor source of data on occupational diseases, particularly those involving a long latency period.

The Statistics Unit of Worksafe Australia is looking at ways to overcome these deficiencies including:

- extending the scope of the national dataset to include all cases that resulted in time lost from work of one day or more;
- collecting data directly from specific industries with a relatively high proportion of self-employed people (such as the rural, transport and retail sectors);
- accessing information recorded at hospital accident and emergency centres and forwarded to AIHW's NISU; and
- upgrading health and vital statistics sources, and utilising the formal survey program of ABS, particularly the national health surveys.

6.4 Disability and handicap

Estimates of numbers of people with disabilities and handicaps are gained from several sources. The most comprehensive sources are the two national surveys conducted by ABS—in 1981 and 1988.

ABS's *1988 Survey of Disabled and Aged Persons* examined the needs and kinds of problems experienced by persons with different types of handicaps, and also collected information on the numbers and characteristics of people with disabilities and handicaps. The survey addressed the important issues of the care required by, and provided for, aged and handicapped people living in private domestic situations and in institutions. A compatible survey was conducted in 1981, and a more extensive survey is planned for 1993.

The Commonwealth Department of Social Security also collects data about people with disabilities and handicaps. These collections are derived from information about payment of allowances, including the Invalid Pension, Sheltered Employment Allowance, Mobility Allowance, Rehabilitation Allowance and Child Disability Allowance. The payment of a Sickness Benefit also encompasses many people with handicaps. Information on child disability allowances are available from regularly published bulletins from the Department of Social Security.

HHCS undertakes collections of information concerning benefits payable to handicapped children. In 1991, HHCS conducted a census of all Commonwealth-funded establishments providing services to people with disabilities. This census, which complements one conducted in 1986, collected information on clients, staff, finances and operations of each establishment. These data, combined with the Disability Information System for Comprehensive User Support (DISCUS), are used for the management and planning of disability services. The Home and Community Care Program (HACC), administered by HHCS, also collects data on aged and young disabled people and their care arrangements.

Administrative data on training and schooling of handicapped adults and children are collected by the Commonwealth Department of Industrial Relations and the Commonwealth Department of Employment, Education and Training.

6.5 Risk factors

Diet and nutrition

Many of the data collections on diet and nutrition are focused on particular foodstuffs or selected demographic characteristics, and, largely due to the diversity of the information needed to be collected, limited ongoing monitoring is undertaken.

One ongoing collection that has been undertaken by HHCS and NHMRC since 1981 is a food analysis program determining the nutrient composition of the Australian food supply. Since 1987, this information has been stored on a HHCS national nutrient databank. HHCS also conducted a national dietary survey of schoolchildren in all States and Territories in 1985.

In recent years, a number of surveys have contributed to knowledge about diet and nutrition. These include the *1983 National Dietary Survey of Adults*, undertaken by the Nutrition Section of the (then) Commonwealth Department of Health (CDH) in conjunction with NHF's 1983 RFPS; a 1985 dietary survey of schoolchildren, also undertaken by the Nutrition Section of CDH; and a study of the iron status of Australian adults, with blood samples collected as part of the NHF's 1989 RFPS. Information about the iron status of children was collected as part of a survey conducted in 1985 by the Australian Council for Health, Physical Education and Recreation (ACHPER). The CSIRO Division of Human Nutrition has undertaken surveys estimating the usual frequency of intake of a listing of selected food and drink items. ABS's 1989–90 NHS included some questions on dietary habits.

Indirect information on diet and nutrition is obtained through ABS's collections on the apparent consumption of foods and nutrients, which have been undertaken since 1936–1937. Based on information about the quantities of various foods available for consumption, estimates are made on apparent nutrient intakes. ABS household expenditure surveys (1974–1975, 1975–1976, 1984 and 1988) also provide details of expenditure by households on various food types.

In recognition of the need for national food and nutrition monitoring and surveillance, NHMRC's Food and Health Committee has established an Expert Panel to develop an information strategy. The panel is taking into account the recommended dietary intakes for Australia, the revised Australian dietary guidelines, their associated nutrition goals and targets, and current policy development activities by HHCS. It is also evaluating existing data collections and assessing the need for future national dietary information.

The recently established National Food Authority, which has responsibility for developing and maintaining national food standards, undertakes a national survey of the levels of pesticides and contaminants in food, covering 50 representative Australian foods. The Authority also publishes food composition tables, and is likely to become more involved in other aspects of dietary and nutritional information.

Gaps and deficiencies

Nutrition and diet are central to many health questions and yet information on this area is still deficient. Ideally, information is required on both the amount and types of food consumed over a given period of time (that is, consumption data) as well as on a range of behavioural data on general dietary habits, changes in dietary habits over time and the use of dietary supplements. National dietary information should be available every 10 years in both urban and rural areas covering both adults and children. Consideration should be given to collecting such information as part of other risk factor prevalence data collections and other population surveys. Some questions on changes in dietary habits were included in ABS's 1989–90 NHS, but the collection of food consumption data poses significant measurement problems, which may need to be addressed in a separate survey.

Physical activity

In recent years, the Commonwealth Department of the Arts, Sport, Environment, Tourism and Territories (DASETT) and its predecessors have conducted several surveys in a program concerned with physical activity and recreation. Surveys of activity levels were conducted in 1984, 1985 and 1986, and a recreation participation survey in 1985–1986.

Other surveys which have measured levels of physical activity have been the NHF's 1983 and 1989 RFPSs and ABS's 1989–90 NHS. As well, ABS's 1985 New South Wales survey of risk factors included questions on physical activity.

The fitness, health and physical performance of children aged 7 to 15 years was the focus of a 1985 survey conducted by ACHPER.

Weight and height

Data on measured weight and height are available from NHF's 1983 and 1989 RFPSs, and self-reported information is available from ABS's 1989–90 NHS. Weight and height measurements for children are available from the *Australian Health and Fitness Survey* conducted in 1985 by ACHPER.

Non-pharmaceutical drug use

Statistics on non-pharmaceutical drug use (including alcohol and tobacco) are being developed as part of a National Drug Abuse Data System (NDADS), responsibility for which lies with the National Drug Abuse Information Centre (NDAIC) located within HHCS. After summarising various aspects of NDADS, this section outlines some primary sources of data on tobacco and alcohol use.

Much of NDADS is currently in a developmental phase, drawing upon many sources of information to provide an assessment of licit and illicit drug use, related treatments, attitudes and behaviour, and awareness of drugs and their related problems. Some of the system's databases are now able to provide information on a regular basis, and NDAIC is currently negotiating with various data providers for access to other databases with particular focus on drug use and its associated consequences. The main components of NDADS can be considered under five main headings: illicit drug use, health outcomes related to drug use, drug treatment services, special population subgroups, and criminal offences related to drug use. Each is outlined briefly here.

Indicators of illicit drug use are monitored through multiple sources, but accurate assessment is difficult. Using key informants, anecdotal evidence from health professionals, and a combination of drug-related arrests and seizures (available from the Australian Bureau of Criminal Intelligence's database), a broad picture of use is available through the Illicit Drugs Situation Report. Monitoring of drug-related AIDS cases and surveys of school students are also used to indicate illicit drug use in the community.

Another focus of the system is the monitoring of health outcomes related to drug use. Estimates of the impact of drug use on mortality and hospitalisation can be made by applying the etiological fractions method (Holman et al. 1988) to deaths and hospitalisation data. Deaths due to drug-related causes are monitored through a forensic reporting system, and information about deaths due to volatile substances is collected from coroners' reports. As well, separate information was collected on drug poisoning cases (National Drug Poisonings Case Reporting System) from 1985 to 1989 (the system is currently under review). Data on drug-related HIV infections are also collected through the database maintained by the National Centre in HIV Epidemiology and Clinical Research.

Drug treatment services are monitored as part of State and Territory programs, but are also the subject of specialised data collections such as the Census of Clients of Treatment Service Agencies (COTSA) undertaken by the University of New South Wales' National Drug and Alcohol Research Centre.

Planned data collections for special population sub-groups include those for students, young people, people of non-English speaking backgrounds, Aborigines and prisoners. Monitoring of drug use in the workplace can also be considered under this heading.

Criminal offences related to drug use have been noted previously, but collections also address traffic accidents involving drug use, as do the limited data available for random breath testing conducted by State and Territory police authorities.

Another NDADS data component relates to the estimation of economic costs associated with drug use.

Tobacco

ABS maintains customs and excise statistics from which apparent consumption of tobacco can be estimated, and has conducted surveys of smoking behaviour in Queensland (1985), New South Wales (1985) and the Northern Territory (1986 and 1990). ABS's 1989–90 NHS included questions on smoking status and the frequency of consumption. The NHF also collected, in its 1980, 1983 and 1989 RFPSs, information on smoking behaviour of adults living in capital cities.

Probably the most useful data on smoking is collected periodically in surveys conducted under the auspices of the Anti-Cancer Council of Victoria (Hill, White, Gray 1991). These surveys provide details of trends in smoking by a number of sociodemographic variables. As well, the Australian Cancer Society and State and Territory authorities conduct occasional surveys on smoking behaviour, including that of schoolchildren.

Administrative data on the manufacture of cigarettes is available from the Australian Customs Service.

Alcohol

Alcohol consumption data are available from similar sources to those for tobacco consumption. ABS reports on the level and type of alcohol consumption in its annual apparent consumption reports. Questions on alcohol consumption were included in ABS's 1989–90 NHS, and drinking patterns have been assessed by ABS in special surveys in South Australia (1983), Western Australia (1985), New South Wales (1985) and the Northern Territory (1986 and 1990).

As part of a 1984 survey, the Australian Cancer Society also asked secondary school students about their consumption of alcohol.

Alcohol excise figures are also available from ABS, together with data on State and Territory franchise taxes and customs duty paid.

Immunisation status

National immunisation data are limited, but State and Territory authorities maintain some data as part of administrative collections indicating the types of vaccines dispensed. In South Australia, this collection has been maintained since the 1950s, and an annual survey relating to the level of measles immunisation in school students has been conducted since 1987. A similar survey, to be conducted on a triennial basis, was initiated in Western Australia in 1989. Prior to then, information had been collected annually in Western Australia from a number of schools. As well, some State and Territory authorities maintain special collections relating to specific population sub-groups. An example is the Aboriginal Health Organisation of South Australia's collection on hepatitis B immunisation status of Aborigines in that State.

Nationally, information on immunisation status has been collected through three surveys undertaken by ABS. In 1983, ABS conducted surveys on the rubella immunisation status of women, and on the level of child immunisation in relation to whooping cough, diphtheria, tetanus, polio, measles and mumps. ABS's 1989–90 NHS included questions relating to all these types of immunisation.

7 Statistics on health care funding, resources and utilisation

7.1 Expenditure

Information on health expenditure is available from a number of sources, including the ABS National Accounts and Public Finance databases, other Commonwealth agencies, State and Territory health authorities, health insurance funds, and workers compensation and third party insurance agencies. The Institute publishes consolidated statistics in this area.

The Institute has developed a number of specific databases on health expenditure. One contains details of total health expenditure from 1970–71, with comprehensive data from 1975–76. This database provides estimates of health expenditure by area of expenditure, and in real and nominal dollars for the period.

A consistent time series of public and private hospital expenditure and utilisation indicators for the period 1982–83 onwards has been developed by the Institute from data provided by State and Territory health authorities, HHCS, the Department of Veterans' Affairs and the Australian Private Hospitals Association.

Databases of health expenditure by age group have been developed using data from the Health Insurance Commission, the Hospital Utilisation and Costs Study, nursing home information from HHCS and pharmaceutical information from an Institute survey of pharmaceutical usage.

Information from other databases on health expenditure by State and Territory for hospitals, nursing homes, medical services, dental and other health professional services and pharmaceuticals will be published in 1992–93.

The Institute has recently revised and expanded the range of health expenditure information it provides to the Organisation for Economic Co-operation and Development (OECD).

Key developments

- Further development of the Institute's health expenditure databases.

- Expansion of the range of health expenditure statistics provided by the Institute to OECD.

Gaps and deficiencies

At present it is difficult to provide comprehensive and comparable health expenditure data at a national level. Inconsistencies between State and Territory governments in the definition and reporting of expenditure data create difficulties, particularly in the areas of dental services, community health and pharmaceutical expenditure. These problems mean that poor quality and secondary data need to be substituted in order to estimate health expenditure at a national level.

7.2 Private health insurance

Private health insurance surveys were conducted by ABS annually between 1979 and 1984, and biennially since that year, to obtain information on the level and type of insurance cover, and reasons for insuring. ABS's 1989–90 NHS also collected information about private health insurance.

The Private Health Insurance Administration Council maintains a collection based on insurance data provided by all registered private health insurance funds. The Council produces quarterly summaries of fund membership, and details of hospital, medical and ancillary benefits paid.

7.3 Labourforce

Data on the health labourforce is collected by a variety of bodies, particularly registration authorities and health professional organisations, and ABS collects labourforce information as part of the five-yearly *Census of Population and Housing*. National data from the 1991 Census are expected to be released in late 1992.

In 1989, the Bureau conducted two surveys related to the health labourforce. *Career Paths of Qualified Nurses*, which surveyed a sample of people aged 15 to 64 years who had qualified as registered or enrolled nurses, describes demographic and other characteristics and work patterns. *How Workers Get Their Training*, which surveyed a larger sample of people, including some from health occupations, focused on the educational profiles, study and training activities (both work-related and other) undertaken in the year previous to the survey. The survey provides information on employer contribution to training, individual contribution to skill attainment, and the various ways in which skills and knowledge are acquired.

Data on the numbers of students in health courses and graduates holding medically-related tertiary qualifications are available from the Commonwealth Tertiary Education Commission and the Department of Employment, Education and Training.

AHMAC has largely funded the development by AIHW of a National Health Labourforce Collection, which will comprise national datasets for the major registered health occupations. This involves the cooperation of State and Territory health authorities and registering bodies, and professional organisations. Each national dataset will be a series of items defined and worded in a standard way, collected through the annual re-registration processes of the State and Territory registering authorities.

Initially, attention was directed to the negotiation of agreements with the nurse and medical registering authorities and State and Territory health authorities. Discussions have since been held with the registering authorities and professional associations representing pharmacists, podiatrists, dietitians, occupational therapists and physiotherapists, leading to negotiations and planning for datasets for these occupations also. The possible inclusion of other registered health occupations will then be addressed.

The national dataset for the dental labourforce is being separately coordinated by the Institute's DSRU. Other information about dentists was collected in 1988–1989 by DSRU in an Australia-wide survey of the participation and productivity of dentists, which included a five-year follow-up of dentists who participated in a similar survey in 1983. The surveys enable the development of a longitudinal picture of participation and productivity, as well as the mix of services provided, and will be valuable in anticipating future changes.

Annual publication by AIHW of information derived from the national dataset for each registered health occupation will provide up-to-date statistics that are comparable across all States and Territories. This information will satisfy a number of user requirements, including the need for regular monitoring of the health labourforce.

Key developments

- Progress towards a National Health Labourforce Collection.

Gaps and deficiencies

The standardised collections of registered professionals should be expanded as a matter of priority to permit analysis of geographic distribution. There is also a need for more detailed information on the distribution, skill levels and other characteristics of employees in both institutional and community sectors. Priority should also be given to the development of statistical collections about health carers who are not required to be registered.

7.4 Institutional facilities

National data are available on the numbers of institutions (hospitals, nursing homes and hostels) providing health care, and the number of beds within these institutions.

For public institutions, data are collected routinely (usually annually) by the various State and Territory health authorities and by the Department of Veterans' Affairs. For private hospitals, bed numbers are supplied to the State and Territory health authorities through private hospital licensing agreements.

HHCS collects private nursing home and hostel bed data for payment purposes. In addition, data are collected by: surveys of private hospitals jointly undertaken by the Australian Private Hospitals Association (APHA) and HHCS; a survey of free-standing day care facilities undertaken by HHCS; and a private organisation for the annual publication *Hospital and health services year book* (1992).

The Institute summarises data on facilities and use of services as part of the Hospital Utilisation and Costs Study (HUCS). Similar summary information is also provided by the University of New South Wales' School of Health Services Management in an annual publication (see *The Australian health care system, 1991* (Grant, Lapsley 1992)).

National staffing and financial data are available for public hospitals only. These data are collected by the various health authorities and are summarised by the Institute as part of HUCS. While the APHA has collected some data for private hospitals, not all private hospitals have provided information. Data for nursing homes and hostels are even more limited.

Although data are available on the numbers of health care institutions, and on the numbers of beds within them, the data are of variable quality. There are a number of definitional problems, including:

- *counting of multi-campus hospitals*—depending on administrative structures, these may be individually counted or counted as one establishment
- *counting of multi-purpose institutions*—for example, a hospital with an attached nursing home
- *definition of a hospital bed*—to be counted, a bed must be 'available' to be used, but there is no agreed definition of what is 'available'. For example, should beds that are not staffed, and should short-term beds for recovery after surgery be counted?

To improve the information on hospital and institutional facilities and the use of their services, the Institute was funded by AHMAC to develop, in collaboration with ABS and Commonwealth, State and Territory health authorities, a national minimum dataset. The National Minimum Data Set for Institutional Health Care (NMDS) was developed by five working parties established as part of the Taskforce on National Hospital Statistics.

At its June 1990 meeting, AHMAC endorsed the adoption of the NMDS. Further development of the NMDS data items and definitions is being undertaken by an Institute committee which includes representation from HHCS, State and Territory health authorities, the Department of Veterans' Affairs, APHA and ABS.

The NMDS represents a set of recommended definitions which will form the basis for the collection of data from public and private hospitals and mental health institutions. For a period of four years from 1991–92, State and Territory health authorities have agreed to supply to the Institute public sector data based on the NMDS. This dataset will replace the current biennial collection of data (HUCS). A corresponding annual survey of private health establishments using the NMDS definitions will be undertaken by ABS. The coverage of private hospitals now includes all except a small number of hospitals in two States. The Institute and ABS will produce joint annual publications, and additional analysis may be undertaken and published on an ad hoc basis.

When fully implemented, the NMDS will provide the basis for the collection of uniform statistics on Australia's health institutions. It is envisaged that a similar dataset will be required for non-institutional care.

Key developments

- Adoption of the National Minimum Data Set for Institutional Health Care.
- Agreement by State and Territory health authorities to provide to the Institute public sector data based on the NMDS.
- Annual surveys of private health establishments being undertaken by ABS.

Gaps and deficiencies

As noted above, there are a number of deficiencies in current data about hospital and institutional facilities. Also, few data are available on the facilities at a sub-institution level. Some attempts have been made to classify beds into broad categories (such as superspecialty and intensive care), but there is no national count of the numbers of different types of wards or operating theatres. It is expected that many of the deficiencies will be overcome with adoption of the NMDS.

7.5 Utilisation of hospital and institutional services

Collection of information on the use of hospital and institutional services largely parallels that on facilities in these institutions (see Section 7.4).

As well, quarterly information is collected from the States and Territories by HHCS under the Medicare Hospital Agreements. HHCS also conducts six-monthly surveys of private hospitals assessing the numbers of inpatients, available beds, services provided and length of stay. Surveys of free-standing day care facilities and monitoring of admission requests to nursing homes are also undertaken by HHCS on a regular basis. ABS's 1989–90 NHS included questions on the use of hospital services, either as an inpatient or non-inpatient.

The Institute's HUCSs for 1985–86, 1987–88 and 1989–90 provide information on the provision, usage and costs of public hospital services. Limited information on private hospitals was obtained from HHCS, and on repatriation hospitals from the Commonwealth Department of Veterans' Affairs.

As noted in Section 7.4, the development and adoption of the National Minimum Data Set for Institutional Health Care should significantly improve the information available on usage and costs of hospital and institutional facilities.

Key developments

- Adoption of National Minimum Data Set for Institutional Health Care.
- Agreement by State and Territory health authorities to provide to the Institute public sector data based on the NMDS.
- Annual surveys of private health establishments being undertaken by ABS.

Gaps and deficiencies

Major deficiencies in statistics on hospital and institutional services relate to information on the quality of care provided, on outcomes, and on efficiency of services.

For hospital inpatients and non-inpatients, problems of data non-comparability should be significantly reduced once the National Minimum Data Set is adopted. However, it will be some time before either diagnosis or patient characteristics are known for non-inpatients. This will remain a gap at least until suitable classification systems for non-inpatients are developed and implemented. The Casemix Development Program, described in the next section, is funding the development of such systems.

Casemix information systems

In recent years, the Commonwealth, States and Territories and the private sector have collaborated to improve hospital information and costing systems, and hence increase effectiveness in the use of hospital resources. This collaboration has enabled the development of casemix systems, which are systems that classify hospital patients into clinically meaningful and uniform groups in terms of the amount of resources they consume.

Much of this work is being supported under the Casemix Development Program (CDP), which was introduced under the second round of the Medicare Agreements in 1988. The Program provided for approximately $30 million over a five-year period.

Activities funded to date have been directed towards:

- the development of patient record information systems within hospitals, so that the data are timely and of a high quality;
- examining the ways in which the different types of patients can be classified to casemix groups that accurately reflect medical practice in Australia, and

developing suitable computer software (for acute patients, the groups are known as diagnosis related groups—DRGs; other systems are being developed to classify non-acute inpatients, non-inpatients and a range of special service groups, such as rehabilitation and some pediatric patients);

- improving understanding of the relative costs of treating different types of patients in Australian hospitals (DRG cost weights); and
- the use of casemix information to examine the appropriateness and quality of hospital care in Australia.

A review in 1991 of the CDP highlighted the need for an increased national focus. As a result of the review, the focus of the Program for the duration of the current Medicare Agreements will be on implementing the basic infrastructure in hospitals in the following six priority areas, to permit (from 1 July 1993) hospital payment to be based on casemix-adjusted output:

- patient coding;
- patient costing and cost modelling;
- quality assurance and utilisation review;
- education;
- information use and technology improvement; and
- payment systems design.

The first version of the Australian National Diagnosis Related Groups (AN-DRG) grouper software is scheduled for implementation on 1 July 1992.

At the 14 April 1992 meeting of AHMC, there was agreement that the adoption of uniform national casemix classifications and groupers and of cost and service weights needed to be addressed in order to advance structural reform within the Australian health care system. These reforms are being pursued in the context of negotiations for the new Medicare Agreements.

7.6 Use of health professional services

Extensive statistics on the use of medical and optometry services provided through Medicare are collected by the Health Insurance Commission. These statistics, which have been compiled since the introduction of Medicare in 1984, cover the type of service, details of the service provider and the cost of the service, plus payment details and patient demographics.

ABS's 1989–90 NHS included questions on consultations with medical practitioners, dentists and a range of other health professionals.

Gaps and deficiencies

Data about the use of services funded under Medicare are very good, but they are limited to services provided by medical practitioners and optometrists, and provide very limited diagnostic information.

There is a growing demand for statistics on the use of services provided by other health professionals (such as dentists, physiotherapists and chiropractors), who is using them, and of the effects of their use. Information on benefits paid by private health insurance funds is a potential source of data on the wide range of services provided by health professionals other than medical practitioners and optometrists.

There is also little information available on voluntary and other services provided through community groups and in the home, or about people obtaining paid care—their health status, socioeconomic status, and the outcomes of that care. Many of the voluntary services are provided by women as part of home duties. With the increasing participation of women in the paid labourforce, the need for information about the voluntary health and welfare labourforce will increase in importance—these services will still need to be provided.

7.7 Health technologies

New technologies and procedures are being introduced at an increasing rate. To determine their influence on the health care system in terms of effectiveness, cost, safety and efficiency, it is important to maintain statistics on their number, distribution and trends in use.

Some data on the use of medical procedures are available through the operation of Medicare and the State and Territory hospital morbidity collections, but these data may overlap and there are no centrally available statistics on non-inpatient services.

In addition there are no standard statistics on the numbers of some types of medical facilities (for example, catheter laboratories) and units of medical equipment (such as CT scanners and ultrasound equipment).

Key developments

- The establishment by the Institute of a database on the use and distribution of selected health care technologies.

Caps and deficiencies

As noted above, data on the use of medical procedures are incomplete, and there is overlap in those that are available. There are no standard statistics on the numbers of some types of medical facilities and units of medical equipment.

7.8 Use of pharmaceutical drugs

Information on the prescription drugs provided under the PBS are collected routinely by HHCS, and those provided under RPBS by DVA. The collection maintained by HHCS can provide estimates of drug utilisation, trends and patterns by benefit category, although frequent administrative changes make annual comparisons difficult.

Some national data on the use of prescription or proprietary drugs are available from ABS's 1977–78, 1983 and 1989–90 national health surveys. Drug use in sport was the subject of a survey conducted in 1980–1983 by the Drug Control Committee of the Australian Sports Medicine Federation.

A major improvement in publicly available information on prescription drug use has occurred since 1989–90 as a result of collaboration between the Pharmacy Guild of Australia and the Drug Utilisation Sub-committee (DUSC) of the Pharmaceutical Benefits Advisory Committee. As part of this collaboration, the Guild surveys a random sample of pharmacies for information on the numbers and types of prescriptions dispensed. This provides, for the first time, reliable estimates of private prescriptions provided through community pharmacies and the number of prescriptions that count towards the Safety Net arrangements of PBS. The DUSC is exploring how a picture of total pharmaceutical drug use in Australia can be obtained.

Information about drugs used in hospitals for the treatment of diseases of the circulatory system was collected by a survey conducted in 1990 by the Society of Hospital Pharmacists of Australia, with the Institute assisting. The results of the survey are being examined by DUSC.

Key developments

- Introduction of regular surveys of samples of pharmacies for information on the numbers and types of prescriptions dispensed.

Gaps and deficiencies

Information about most aspects of pharmaceutical drug use in Australia is poor. Good quality data do not exist for the aggregated use of drugs (such as total expenditure by hospitals or individuals on prescription drugs) or for disaggregated use (such as patterns of drug use by individuals).

The assessment of trends in drug use and expenditure is confounded by changes in administrative arrangements governing drug distribution and use, such as:

- changes to prescription requirements—either in terms of items covered by the Pharmaceutical Benefits Schedule, or allowable quantities of drugs per prescription
- the amalgamation of the pensioner and concessional categories.

8 Health statistics for specific population groups

8.1 Women

Although women are identified routinely in health data collections, recognition of the special needs of women has implications for the nature of these collections. These special needs were highlighted in *National women's health policy: advancing women's health in Australia* (DCSH 1989), which saw the need to develop a theoretical framework based on a social model of health. Drawing on work undertaken by the Institute (Lee 1988), which identified women's health information needs, the policy report noted the need to:

- provide funding to develop health status indicators appropriate to women's health (this would involve the development of a comprehensive set of indices, including mental health and morbidity indices—for example, fatigue and incontinence; and indices of occupational illness—for example, stress and chronic pain);
- encourage incorporation of appropriate indicators in a range of health and social data collections;
- take account of and identify specific women's health issues;
- identify women's health as a concept in its own right; and
- provide time series information to demonstrate differences in health status between groups of women (DCSH 1989:73, 99).

As noted above, women are identified routinely in health data collections (such as deaths registration, hospital morbidity, disease registers and population surveys). There is also considerable information about fertility and aspects of childbearing available through birth registration systems and the maternal/perinatal and other collections (see 'Births and pregnancy outcome', page 269). As well, data collections targeting women are likely to improve in the near future as programs dealing with female-specific health conditions are put in place under the auspices of the National Women's Health Program.

In recognition of the specific health needs of women, ABS's 1989–90 NHS included a special questionnaire about some women's health issues. The questionnaire included questions about knowledge and practice of preventive measures (such as breast self-examination and screening for breast and cervical cancer), hysterectomy, use of contraceptives, and breastfeeding of infants.

The general development of health data collections is important for the women's health database. For example, the three national health surveys conducted by ABS (1977–1978, 1983 and 1989–1990) and NHF's three risk factor prevalence surveys (1980, 1983 and 1989) are important data sources for examining changes in women's health status and risk factors.

Other information about women's health is gathered through special collections, such as the Institute's evaluation of pilot programs of breast and cervical cancer screening, and various ad hoc studies.

Key developments

- Increased recognition of special health data needs for women.
- Inclusion of special questions on women's health in ABS's 1989–90 NHS.

Gaps and deficiencies

The areas identified in *National women's health policy: advancing women's health in Australia* (DCSH 1989) (see above) are the major deficiencies in women's health data needs. The social health framework suggested in this document would enable appropriate health status indicators to be interpreted in their social and environmental context.

Deaths data are deficient in the recording of occupational information on women, and collections relating to specific health conditions are deficient. For example, there are few data on women's emotional and mental health; on substance abuse (including the over-use of prescribed medications and cigarette smoking in adolescent females); and on violence (including sexual violence) against women.

There is also a need for better information on the use of health services by women—for example, in assessment, recall and support systems for cervical cancer screening programs.

8.2 Australian Aborigines and Torres Strait Islanders

The need for national Aboriginal health statistics has been recognised for many years, and a high level Federal Task Force on Aboriginal Health Statistics established in 1984 reached agreements with all States and Territories except Queensland (which it did not visit) to identify Aborigines in a number of 'priority' health statistical collections (Task Force on Aboriginal Health Statistics 1985). Priority collections were identified as the birth and death registration systems, and the hospital morbidity and maternal/perinatal collections.

Prior to the Task Force, a number of States and Territories already had the capacity to identify Aborigines in some of their collections, but for the development of national statistics there was a need to extend the coverage to all States and Territories.

Provision now exists in one form or another for the identification of Aborigines for all priority collections except the births and deaths registration systems in Queensland. As well, all except the Tasmanian cancer registry provide for Aboriginal identification in cancer registrations. Much less progress has been made in providing for Aboriginal identification in communicable disease notifications.

Of the major health surveys undertaken by ABS, the first to provide for the identification of Aborigines was the 1989–90 NHS, but no special sampling procedures were employed to ensure that an adequate sample of Aborigines was included. Aborigines have not been separately identified in the NHF's RFPSs.

As part of its response to the Royal Commission into Aboriginal Deaths in Custody, the Government has announced its intention to conduct, through ABS, a national Aboriginal survey in the first half of 1994. Information will be collected on the demographic, social, economic and health characteristics of the Aboriginal and Torres Strait Islander population.

Work by the Institute is proceeding on the development of databases for the collections identified as priorities by the Task Force on Aboriginal Health Statistics—births and deaths, and the hospital morbidity and maternal/perinatal collections. As well, the Institute undertook a small survey of disability and handicaps among Aboriginal people.

Key developments

- Inclusion of an Aboriginal identifier in: all births and deaths registration systems except for those in Queensland; all cancer registration systems except for that in Tasmania; and in ABS's 1989–90 NHS.
- Further development of the Institute's Aboriginal health databases.
- The planned national Aboriginal survey, scheduled to be conducted in the first half of 1994.

Gaps and deficiencies

Provision for the identification of Aborigines in major health statistical collections and surveys and the decision to conduct a national Aboriginal survey represent important advances. However, providing for identification does not guarantee that Aborigines are so identified. This problem is recognised as most significant in the larger urban centres in the south of the continent.

To ensure that adequate levels of Aboriginal identification are achieved in the health-related collections, intensive validation studies and often remedial procedures are required. ABS, in collaboration with the relevant State and Territory agencies has undertaken some evaluation of the quality and coverage of data relating to Aboriginal births and deaths. The eventual aim is for ABS to publish national Aboriginal vital statistics data.

There is also a need for Aboriginal identifiers to be included in other major health collections, such as communicable disease notifications.

The relative lack of information about Aboriginal people with disabilities and handicaps is another major gap in health statistics relating to Aborigines.

8.3 Ethnic groups

Most of the major health statistical collections and surveys provide some identification of ethnicity, usually in terms of country of birth. This form of ethnic identification is included in the vital statistics collections, major disease databases (heart disease, cancer, communicable diseases, workers' injuries), patient treatment records within medical institutions (hospital morbidity), and in ABS's 1989–90 NHS.

Special health data collections also target migrant populations. Examples of these collections are:

- Anti-Cancer Council of Victoria's Health 2000 longitudinal survey focusing on Greek and Italian communities in Melbourne
- University of Newcastle's study of psychiatric morbidity among adult Vietnamese refugees in New South Wales

- National Centre for Epidemiology and Population Health's study of ethnic women caregivers in Canberra, Sydney and Melbourne.

The Institute has just published a major report on ethnic health, including a review of data sources (Donovan et al. 1992). A parallel volume documents health data collections containing ethnic identifiers (van Ommeren, Merton 1992).

Key developments

- The compilation by the Institute of information about ethnic health and about collections containing ethnic identifiers.

Gaps and deficiencies

Most major collections provide for identification of ethnic origin, largely through country of birth. However, the variables describing ethnicity are not standard and include broad and individual categorisations of country of birth, period of residence in Australia, languages spoken at home, proficiency in English, and country of birth of parents. The main deficiency of many collections is the relative incompatibility of the coding systems. ABS's *Australian standard classification for social statistics* (ABS 1990a) is the recommended basis for coding whenever demographic, social, health and labour statistics are classified by country. However, the codes are not consistently applied in some sample or administrative collections. The codes are also revised periodically to take account of shifts in political boundaries and changing patterns of migration to Australia.

Country of birth is an approximation for ethnic status for many migrants, but it fails to provide for the ethnic identification of their children, who may be subject to strong influences in exposure to risk factors, behaviour patterns, in accessing health services and health information, and in health outcomes. Another deficiency is the lack of identification of ethnic groups within particular countries of birth. Such identification has been attempted in some health collections (for example, Victorian cancer registrations), but responses have been unreliable. Another difficulty associated with this approach is the lack of appropriate population data against which the health data can be assessed.

8.4 Older people

Health statistics relating generally to older people are plentiful, compiled routinely through deaths statistics, hospital morbidity and institutional care data collections, disease registers, and as part of many population surveys, such as ABS's 1989–90 NHS. Population health surveys can vary in their definition of older people—ABS defines older people as aged 60 years or more, while some surveys define them as aged 55 years or more. Partly reflecting this, results are often not presented separately for the very old. For example, published results from ABS's 1989–90 NHS do not disaggregate the results for respondents aged 75 years or older.

A better disaggregation of data for older people has been achieved in special surveys, such as ABS's *1981 Survey of Handicapped Persons* and *1988 Survey of Disabled and Aged Persons*. However, while this approach provides better information about the many older people with disabilities, it does not adequately address the needs of the well aged.

The Home and Community Care Program (HACC), which provides a range of domestic care facilities to older people to avoid premature or inappropriate institutionalisation, collects statistics related to users of these services. ABS also conducted a survey in 1983 assessing the need for in-home care for older people in Queensland.

Agencies such as the Departments of Social Security and Veterans' Affairs also maintain administrative collections about benefit or pension payments for older people.

HHCS's annual nursing home data collection provides information about clients, staffing and payments. State and Territory authorities also maintain collections about older people requiring nursing home care—an example is the South Australian Health Commission's nursing home census (1981). Information about older people whose health condition resulted in long stays in New South Wales hospitals was collected as part of ABS hospital censuses in 1983 and 1985.

Studies on the health and wellbeing of older people are also conducted on an ad hoc basis. Examples of these studies are the Dubbo community study conducted by St Vincent's Hospital (1988), the Australian National University's study of non-institutionalised older people in Sydney (1981), and the Australian Institute of Multicultural Affairs' survey of ethno-specific accommodation facilities for older people in Sydney and Melbourne (1985).

Important new information on the dental health and impact of dental disease on older people is being gained through a longitudinal study being conducted by the University of Adelaide. The study surveys people aged 60 years or more living in Adelaide and Mt Gambier. Funded by NHMRC, and part of an international collaborative study of the United States' National Institutes of Health, the study is examining the incidence, prevalence and risk factors of dental disease, and its impact on social interactions and wellbeing.

Gaps and deficiencies

With increasing attention on the impact of an ageing population on Australian society generally, and the health care delivery system in particular, the requirement for regular surveys on ageing needs to be addressed. Such surveys should provide functional and quality of life measures for older people as well as data on needs, circumstances and nature of care and carers. Another possibility is the development of sets of special health questions for inclusion in non-health collections.

As noted above, many surveys (such as ABS's 1989–90 NHS) do not include sufficient numbers of very old people for the presentation of separate data. To allow differentiation between the sub-groups of the older population in terms of health conditions, risk factors and care, special sampling procedures will be required to ensure the inclusion of adequate numbers of very old people.

ABS is considering proposals for the *Survey of Disabled and Aged Persons* to become a core survey, and be repeated at regular intervals. At the same time, it is likely that consideration will be given to separating the collection of information about the well aged from collections concentrating on people with disabilities and handicaps.

8.5 People with disabilities and handicaps

Statistics about people with disabilities and handicaps are fragmented, at least partly because of the division of responsibilities for the provision of services: between the Commonwealth and State and Territory governments; between government and non-government agencies; and between health and welfare-oriented agencies. For example, primary responsibility for the provision of services for people with intellectual disabilities in Victoria is with the State Government's Community Services

Victoria. Non-government agencies, such as the Brotherhood of St Laurence, also provide some services for people with intellectual handicaps.

In attempting to construct a national picture, ABS has, as noted earlier, conducted two surveys on disability and handicap—the *1981 Survey of Handicapped Persons* and the *1988 Survey of Disabled and Aged Persons*. A repeat of the 1988 survey is planned for 1993.

At the Federal level, the Department of Social Security maintains administrative collections about benefits and pensions paid to people with disabilities and handicaps, and HHCS collects data for planning and monitoring the services provided by its Assistance for People with Disabilities Program. For this Program, highest priority is given to data on the number of services funded and the amount of funding, but attention is also given to information on the number and characteristics of clients, the quality of service provided, and client outcomes. Information is gathered from five sub-programs: rehabilitation, hearing services, accommodation, employment, and community participation. Within each area, some special data items are collected (for example, types of hearing aids fitted). In 1986 and 1991, HHCS conducted censuses of disability services, which also described program clients.

Less is known about the data collected by the States and Territories in relation to the services they provide for people with disabilities and handicaps. A new Commonwealth/States Disability Agreement, currently being considered, is expected to include arrangements to use, for planning and evaluation purposes, administrative data relating to services provided for people with disabilities.

Gaps and deficiencies

With increasing attention on people with disabilities and handicaps and their special needs, there is a requirement for regular surveys to be conducted, and for the collection of uniform data on services provided. As is the case for older people, surveys should provide functional and quality-of-life measures, as well as data on needs, circumstances and nature of care and carers. Information would be enhanced by the development of sets of health and disability questions for inclusion in non-health collections.

As noted above, ABS is considering proposals for the *Survey of Disabled and Aged Persons* to become a core survey, and for separation of the collection of information about the well aged from collections on people with disabilities and handicaps.

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Statistical tables

Population

Table S1: Estimated resident population by sex and age group, States and Territories, 30 June 1990

Males (Number)

State / Territory	*Age group (years)*											
	Less than 1	*1–4*	*5–14*	*15–24*	*25–34*	*35–44*	*45–54*	*55–64*	*65–74*	*75–84*	*85 and over*	*All ages*
NSW	45,043	174,949	428,489	461,145	476,645	444,846	323,169	260,319	191,385	83,030	14,014	2,903,034
Vic	33,537	127,856	317,153	368,507	364,367	329,363	236,438	191,025	134,037	61,860	11,337	2,175,480
Qld	22,400	85,952	227,133	251,192	237,614	218,867	156,769	119,886	90,894	40,421	7,298	1,458,426
WA	12,935	51,922	128,061	136,278	144,809	131,041	87,949	64,481	43,436	20,389	3,894	825,195
SA	10,016	40,533	101,997	116,791	121,678	108,365	75,286	65,133	49,998	22,938	4,020	716,755
Tas	3,587	14,236	35,998	36,128	36,293	33,767	24,128	19,698	14,799	6,949	1,194	226,777
ACT	2,300	8,492	22,326	28,728	26,806	24,170	15,268	8,894	4,916	1,692	283	143,875
NT	1,783	6,435	14,598	15,036	15,592	13,815	8,515	3,884	1,822	493	84	82,057
Australia	**131,601**	**510,375**	**1,275,755**	**1,413,805**	**1,423,804**	**1,304,234**	**927,522**	**733,320**	**531,287**	**237,772**	**42,124**	**8,531,599**

Continued next page

Table S1: Estimated resident population by sex and age group, States and Territories, 30 June 1990 (continued)

Females (Number)

State / Territory	Less than 1	1–4	5–14	15–24	25–34	35–44
NSW	42,304	166,776	410,225	440,821	469,630	433,678
Vic	32,055	121,861	302,363	355,379	361,324	327,240
Qld	21,565	81,619	214,163	239,058	233,122	215,693
WA	12,223	48,985	120,521	130,635	138,738	125,610
SA	9,455	38,627	96,087	111,001	116,933	107,077
Tas	3,321	13,533	34,456	35,542	35,939	33,313
ACT	2,161	8,485	21,636	27,348	24,946	24,277
NT	1,676	6,252	13,506	13,876	15,634	12,391
Australia	**124,760**	**486,138**	**1,212,957**	**1,353,660**	**1,396,266**	**1,279,279**

State / Territory	45–54	55–64	65–74	75–84	85 and over	All ages
NSW	306,208	259,395	226,488	130,706	37,585	2,923,816
Vic	227,052	189,893	159,919	97,403	29,853	2,204,342
Qld	147,836	118,522	101,501	58,014	17,259	1,448,352
WA	81,586	62,059	49,328	30,086	8,859	808,630
SA	73,888	64,813	58,628	35,300	10,557	722,366
Tas	23,270	19,626	17,645	10,409	2,802	229,856
ACT	14,575	8,317	5,947	2,772	738	141,202
NT	6,541	3,056	1,617	538	133	75,220
Australia	**880,956**	**725,681**	**621,073**	**365,228**	**107,786**	**8,553,784**

Persons

State / Territory	Less than 1	1–4	5–14	15–24	25–34	35–44
NSW	87,347	341,725	838,714	901,966	946,275	878,524
Vic	65,592	249,717	619,516	723,886	725,691	656,603
Qld	43,965	167,571	441,296	490,250	470,736	434,560
WA	25,158	100,907	248,582	266,913	283,547	256,651
SA	19,471	79,160	198,084	227,792	238,611	215,442
Tas	6,908	27,769	70,454	71,670	72,232	67,080
ACT	4,461	16,977	43,962	56,076	51,752	48,447
NT	3,459	12,687	28,104	28,912	31,226	26,206
Australia	**256,361**	**996,513**	**2,488,712**	**2,767,465**	**2,820,070**	**2,583,513**

State / Territory	45–54	55–64	65–74	75–84	85 and over	All ages
NSW	629,377	519,714	417,873	213,736	51,599	5,826,850
Vic	463,490	380,918	293,956	159,263	41,190	4,379,822
Qld	304,605	238,408	192,395	98,435	24,557	2,906,778
WA	169,535	126,540	92,764	50,475	12,753	1,633,825
SA	149,174	129,946	108,626	58,238	14,577	1,439,121
Tas	47,398	39,324	32,444	17,358	3,996	456,633
ACT	29,843	17,211	10,863	4,464	1,021	285,077
NT	15,056	6,940	3,439	1,031	217	157,277
Australia	**1,808,478**	**1,459,001**	**1,152,360**	**603,000**	**149,910**	**17,085,383**

Source: Australian Bureau of Statistics 1991c

Table S2: Estimated resident population by sex and age group, selected years, 1901 to 1990

(Number)

Age group (yrs)	*1901*	*1921*	*1941*	*1961*	*1981*	*1986*	*1990*
Males							
Less than 1	47,247	68,140	64,746	116,736	117,842	122,376	131,601
1–4	172,957	237,382	235,996	451,006	465,376	496,644	510,375
5–14	450,067	569,576	572,940	1,058,453	1,321,340	1,277,080	1,275,755
15–24	366,146	455,681	631,286	776,319	1,320,618	1,368,973	1,413,805
25–34	320,455	453,279	594,709	728,618	1,244,663	1,317,452	1,423,804
35–44	279,558	367,484	493,543	739,220	931,360	1,161,863	1,304,234
45–54	156,674	280,969	434,359	628,894	772,879	810,180	927,522
55–64	99,170	207,023	305,575	428,856	661,984	736,433	733,320
65–74	64,716	89,483	172,064	266,069	426,174	475,396	531,287
75–84	18,731	29,188	68,762	102,292	158,247	199,083	237,772
85 and over	2,207	4,665	7,739	15,789	27,784	34,707	42,124
All ages	**1,977,928**	**2,762,870**	**3,581,719**	**5,312,252**	**7,448,267**	**8,000,187**	**8,531,599**
Females							
Less than 1	46,077	65,312	62,008	111,755	112,880	116,208	124,760
1–4	168,836	229,372	226,841	429,996	443,520	473,257	486,138
5–14	441,003	555,222	551,617	1,009,052	1,264,582	1,213,953	1,212,957
15–24	365,792	462,563	613,096	730,052	1,278,293	1,314,958	1,353,660
25–34	293,424	458,492	573,606	665,421	1,212,261	1,300,222	1,396,266
35–44	216,135	351,166	473,819	707,223	891,517	1,119,161	1,279,279
45–54	118,574	255,574	439,892	596,964	737,394	768,943	880,956
55–64	80,302	178,233	305,835	435,378	691,752	738,536	725,681
65–74	48,935	80,705	184,734	332,702	511,502	567,952	621,073
75–84	14,757	30,777	78,425	148,351	256,487	310,384	365,228
85 and over	2,038	5,448	10,714	29,040	74,805	94,589	107,786
All ages	**1,795,873**	**2,672,864**	**3,520,587**	**5,195,934**	**7,474,993**	**8,018,163**	**8,553,784**
Persons							
Less than 1	93,324	133,452	126,754	228,491	230,722	238,584	256,361
1–4	341,793	466,754	462,837	881,002	908,896	969,901	996,513
5–14	891,070	1,124,798	1,124,557	2,067,505	2,585,922	2,491,033	2,488,712
15–24	731,938	918,244	1,244,382	1,506,371	2,598,911	2,683,931	2,767,465
25–34	613,879	911,771	1,168,315	1,394,039	2,456,924	2,617,674	2,820,070
35–44	495,693	718,650	967,362	1,446,443	1,822,877	2,281,024	2,583,513
45–54	275,248	536,543	874,251	1,225,858	1,510,273	1,579,123	1,808,478
55–64	179,472	385,256	611,410	864,234	1,353,736	1,474,969	1,459,001
65–74	113,651	170,188	356,798	598,771	937,676	1,043,348	1,152,360
75–84	33,488	59,965	147,187	250,643	414,734	509,467	603,000
85 and over	4,245	10,113	18,453	44,829	102,589	129,296	149,910
All ages	**3,773,801**	**5,435,734**	**7,102,306**	**10,508,186**	**14,923,260**	**16,018,350**	**17,085,383**

Sources: Commonwealth Statistician 1925
Commonwealth Bureau of Census and Statistics 1943; 1970a
Australian Bureau of Statistics 3201.0

Table S3: Estimates and projections of proportion of population aged 65 and over, selected countries, 1950 to 2025

(Per cent)

Country	*1950*	*1960*	*1970*	*1980*	*1990*	*2000*	*2010*	*2020*	*2025*
Australia	8.1	8.5	8.3	9.6	10.9	11.7	12.8	15.9	17.5
Canada	7.7	7.5	7.9	9.5	11.4	12.7	14.4	18.8	21.2
Chile	4.3	4.7	5.1	5.6	6.0	6.7	7.7	9.6	10.9
East Germany	10.6	13.7	15.5	15.9	13.1	na	na	na	na
France	11.4	11.6	12.9	14.0	13.8	15.4	15.7	19.3	20.8
Greece	6.8	8.3	11.1	13.1	13.7	16.9	18.4	19.9	20.9
Iceland	7.7	8.0	8.8	9.6	10.7	11.3	12.0	15.4	18.1
India	3.3	3.4	3.7	4.0	4.5	5.1	5.9	7.2	8.2
Indonesia	4.0	3.3	3.1	3.3	3.9	5.1	6.4	7.8	9.1
Ireland	10.7	11.2	11.2	10.8	10.3	9.6	9.8	11.9	13.1
Israel	3.9	4.9	6.7	8.6	8.9	8.6	8.6	11.4	12.6
Italy	8.3	9.3	10.9	13.1	14.3	16.9	18.7	21.2	22.8
Japan	4.9	5.7	7.1	9.0	11.7	15.9	19.6	23.7	23.9
Lebanon	7.2	5.8	4.9	5.4	5.0	5.5	5.1	5.8	6.8
Malaysia	5.1	3.4	3.4	3.7	3.7	4.2	5.3	7.3	8.6
Malta	5.8	7.3	9.2	9.9	10.2	10.9	12.1	16.8	18.3
Netherlands	7.7	9.0	10.2	11.5	12.7	13.6	15.2	19.4	21.3
New Zealand	9.0	8.6	8.5	10.0	10.9	11.2	12.4	15.6	17.3
Norway	9.7	11.1	12.9	14.8	16.4	15.8	15.6	19.3	21.0
Philippines	3.6	3.0	2.7	3.4	3.4	3.7	4.4	5.8	6.9
Poland	5.2	5.8	8.2	10.1	10.0	11.7	11.5	15.0	16.9
Singapore	2.3	2.1	3.4	4.7	5.6	7.2	9.5	15.3	19.1
South Africa	3.6	3.9	3.8	4.0	4.2	4.5	5.1	6.3	7.2
Spain	7.3	8.2	9.8	10.7	13.1	15.2	15.6	17.4	19.2
Sweden	10.3	12.0	13.7	16.3	18.1	17.1	18.8	21.8	22.4
Switzerland	9.6	10.1	11.3	13.8	15.0	16.3	18.8	21.9	23.4
United Kingdom	10.7	11.7	12.9	15.1	15.4	15.2	15.7	18.2	19.4
USA	8.1	9.2	9.8	11.3	12.6	12.8	13.6	17.5	19.8
USSR	6.1	6.8	7.4	10.3	9.6	na	na	na	na
Vietnam	3.9	4.2	4.3	4.8	4.5	4.5	4.2	5.2	6.5
West Germany	9.4	10.8	13.2	15.5	15.4	na	na	na	na
Yugoslavia	5.7	6.3	7.8	9.4	9.5	na	na	na	na

Source: United Nations 1991a

Table S4: Estimates and projections of proportion of population aged 75 and over, selected countries, 1950 to 2025

(Per cent)

Country	*1950*	*1960*	*1970*	*1980*	*1990*	*2000*	*2010*	*2020*	*2025*
Australia	**2.6**	**2.7**	**3.0**	**3.4**	**4.2**	**5.0**	**5.4**	**6.3**	**7.3**
Canada	2.4	2.7	3.0	3.6	4.6	5.6	6.3	7.5	9.0
Chile	1.2	1.4	1.7	1.9	2.2	2.4	2.9	3.4	3.9
East Germany	2.9	4.4	5.1	6.5	6.3	na	na	na	na
France	3.9	4.3	4.7	6.2	6.5	6.7	7.7	7.9	9.4
Greece	2.2	3.0	3.8	5.0	5.7	6.4	8.6	9.1	9.9
Iceland	2.8	2.3	3.4	3.9	4.3	4.7	5.5	6.2	7.4
India	0.8	0.8	0.9	1.0	1.2	1.5	1.9	2.3	2.6
Indonesia	1.0	0.9	0.8	0.8	1.2	1.5	2.2	2.8	3.1
Ireland	3.7	4.2	4.1	3.9	4.0	4.0	3.9	4.3	5.0
Israel	1.0	1.4	1.9	2.8	3.7	3.6	3.6	3.9	4.8
Italy	2.6	3.1	3.9	4.7	6.1	6.9	8.5	9.7	10.7
Japan	1.3	1.8	2.1	3.1	4.6	6.0	8.5	10.8	12.7
Lebanon	2.3	1.9	1.6	1.6	1.8	1.6	1.9	1.8	2.0
Malaysia	1.7	1.3	1.0	1.1	1.2	1.4	1.8	2.3	2.8
Malta	1.6	1.8	3.1	3.3	3.7	4.1	4.5	5.7	7.2
Netherlands	2.4	3.1	3.7	4.6	5.4	6.0	6.7	7.8	9.5
New Zealand	2.6	3.3	3.0	3.5	4.3	4.8	5.1	6.0	7.2
Norway	3.6	4.0	4.7	5.9	6.9	8.0	7.6	7.9	9.6
Philippines	1.0	0.9	0.9	1.0	1.0	1.1	1.3	1.7	2.0
Poland	1.7	1.7	2.4	3.6	4.0	4.1	5.0	4.9	6.0
Singapore	0.8	0.7	0.8	1.2	1.9	2.3	3.2	4.5	6.2
South Africa	0.8	1.1	1.2	1.2	1.3	1.5	1.7	2.1	2.4
Spain	2.4	2.7	3.3	3.8	5.2	6.0	7.3	7.7	8.4
Sweden	3.4	4.2	4.9	6.5	8.1	8.7	8.3	10.0	11.3
Switzerland	2.9	3.5	3.9	5.7	6.9	7.5	8.4	10.2	11.3
United Kingdom	3.5	4.2	4.5	5.8	6.7	6.9	7.0	7.6	8.8
USA	2.6	3.1	3.7	4.4	5.2	6.1	6.2	6.9	8.1
USSR	1.9	2.2	2.4	4.1	4.1	na	na	na	na
Vietnam	0.9	1.0	1.1	1.6	1.4	1.4	1.6	1.5	1.7
West Germany	2.7	3.5	4.2	6.1	7.3	na	na	na	na
Yugoslavia	1.6	2.1	2.2	3.0	3.7	na	na	na	na

Source: United Nations 1991a

Fertility and pregnancy outcome

Table S5: Live births by sex of baby and age group of mother, States and Territories(a), 1990

(Number)

Sex of baby / Age of mother (years)	*NSW*	*Vic*	*Qld*	*WA*	*SA*	*Tas*	*ACT*	*NT*	*Australia*
Male births									
Under 20	2,659	1,452	1,744	768	633	247	87	272	7,862
20–24	9,382	6,254	5,035	2,697	2,061	842	461	472	27,204
25–29	17,259	12,995	8,527	4,810	3,950	1,318	851	522	50,232
30–34	12,594	10,015	5,730	3,504	2,602	899	645	383	36,372
35–39	4,193	3,133	1,762	1,143	811	275	234	126	11,677
40 and over	663	480	278	160	113	39	36	21	1,790
All ages(b)	**46,752**	**34,357**	**23,082**	**13,082**	**10,170**	**3,620**	**2,333**	**1,798**	**135,194**
Female births									
Under 20	2,399	1,364	1,522	812	546	248	94	260	7,245
20–24	8,873	5,878	4,927	2,550	2,086	819	375	457	25,965
25–29	16,185	12,270	8,015	4,483	3,656	1,292	783	522	47,206
30–34	11,619	9,516	5,373	3,290	2,597	829	627	377	34,228
35–39	4,063	3,103	1,697	975	691	202	207	125	11,063
40 and over	641	464	249	161	116	33	28	18	1,710
All ages(b)	**43,782**	**32,613**	**21,786**	**12,274**	**9,693**	**3,423**	**2,124**	**1,759**	**127,454**
All births									
Under 20	5,058	2,816	3,266	1,580	1,179	495	181	532	15,107
20–24	18,255	12,132	9,962	5,247	4,147	1,661	836	929	53,169
25–29	33,444	25,265	16,542	9,293	7,606	2,610	1,634	1,044	97,438
30–34	24,213	19,531	11,103	6,794	5,199	1,728	1,272	760	70,600
35–39	8,256	6,236	3,459	2,118	1,502	477	441	251	22,740
40 and over	1,304	944	527	321	229	72	64	39	3,500
All ages(b)	90,534	66,970	44,868	25,356	19,863	7,043	4,457	3,557	262,648

(a) Based on State or Territory of usual residence of mother.

(b) Includes 'not stated'.

Source: Australian Bureau of Statistics 1991a

Table S6: Age-specific birth rates[a] and total fertility rates[b], 1921 to 1990

(Live births per 1,000 females)

	Age group of mother (years)							
	Less than 20	*20–24*	*25–29*	*30–34*	*35–39*	*40–44*	*45 and over*	*Total fertility rate*
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
Annual rates								
1986	21.8	90.0	141.9	88.7	27.2	4.3	0.2	1,870
1987	20.6	85.2	139.8	90.6	28.9	4.8	0.3	1,851
1988	20.2	81.8	137.2	93.4	30.5	4.6	0.2	1,840
1989	20.6	78.6	136.2	96.0	32.5	5.0	0.2	1,846
1990	22.0	79.6	139.0	101.6	34.7	5.5	0.2	1,913

(a) Age-specific birth rates are the live births registered during the calendar year, according to age of mother, per 1,000 of the female resident population of the same age as estimated for 30 June.

(b) Total fertility rate is obtained by summing the 5-year age-specific birth 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: Australian Bureau of Statistics 4.4; 3301.0

Table S7: Age-specific birth rates[a] and total fertility rates[b], States and Territories[c], 1990

(Live births per 1,000 females)

	Age group of mother (years)							
State / Territory	*Less than 20*	*20–24*	*25–29*	*30–34*	*35–39*	*40–44*	*45 and over*	*Total fertility rate*
New South Wales	22.2	85.6	142.9	102.8	37.2	6.0	0.2	1,985
Victoria	15.9	68.0	138.8	109.1	37.2	5.8	0.2	1,875
Queensland	26.5	86.1	139.8	96.7	31.5	4.8	0.2	1,929
Western Australia	24.3	80.0	133.6	98.2	32.1	5.2	0.3	1,868
South Australia	21.6	73.7	129.2	89.5	27.3	4.3	0.2	1,729
Tasmania	26.2	99.6	147.9	94.4	28.1	4.3	0.2	2,004
ACT	14.0	58.8	128.8	105.2	36.0	5.3	0.1	1,741
Northern Territory	83.4	124.0	132.1	98.4	38.3	6.7	—	2,415
Australia	**22.0**	**79.6**	**139.0**	**101.6**	**34.7**	**5.5**	**0.2**	**1,913**

(a) Age-specific birth rates are the live births registered during the calendar year, according to age of mother, per 1,000 of the female resident population of the same age as estimated for 30 June.

(b) Total fertility rate is obtained by summing the 5-year age-specific birth 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.

(c) Based on State or Territory of usual residence of mother.

Source: Australian Bureau of Statistics 1991a, 1991c

Table S8: Crude birth rates[(a)] and total fertility rates[(b)], selected countries, 1989 or nearest year

	Crude birth rate		*Total fertility rate*	
Country	*Year*	*Rate*	*Year*	*Rate*
Australia	**1989**	**14.9**	**1990**	**1,913**
Canada	1988	14.5	1988	1,656
Chile	1989	23.4	1989	2,548
East Germany	1989	12.0	1988	1,690
France	1989	13.6	1988	1,828
Greece	1989	10.1	1984	1,824
Iceland	1989	18.0	1989	2,212
India	1989	30.5	1987	4,200
Indonesia	1988	28.6	1989	3,380
Ireland	1989	14.7	1988	2,181
Israel	1989	22.3	1989	3,034
Italy	1989	9.7	1988	1,326
Japan	1989	10.1	1989	1,541
Lebanon	1988	31.7	1987	3,300
Malaysia	1988	29.2	1988	3,591
Malta	1989	16.5	1989	2,106
Netherlands	1989	12.7	1989	1,559
New Zealand	1989	17.5	1988	2,094
Norway	1989	14.0	1989	1,890
Philippines	1988	33.2	1988	3,335
Poland	1989	14.9	1988	2,126
Singapore	1989	17.8	1988	1,975
South Africa	1988	32.1	1987	4,400
Spain	1988	10.7	1986	1,545
Sweden	1989	13.6	1988	1,964
Switzerland	1989	12.2	1988	1,570
United Kingdom	1989	13.6	1989	1,807
USA	1988	16.0	1988	1,929
USSR	1989	17.7	1989	2,322
Vietnam	1988	31.8	1987	3,900
West Germany	1989	11.0	1988	1,434
Yugoslavia	1989	14.2	1989	1,882

(a) Live births per 1,000 mid-year population.

(b) Total fertility rate is obtained by summing the 5-year age-specific birth 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.

Sources: United Nations 1992
World Health Organization 1992

Table S9: Birthweight distribution of total births[a], States and Territories, 1988

Births / Birthweight	*NSW*	*Vic*	*Qld*	*WA*	*SA*	*Tas*	*ACT*	*NT*	*Australia*
					(Number)				
Births									
Less than 2,500g	5,056	3,687	2,524	1,537	1,235	412	257	289	14,997
All births	**80,737**	**63,464**	**41,037**	**25,078**	**19,419**	**6,921**	**4,759**	**2,658**	**244,073**
					(Per cent)				
Birthweight (g)									
500 to 999	0.5	0.5	0.5	0.5	0.6	0.6	0.4	0.8	0.5
1,000 to 1,499	0.6	0.6	0.7	0.7	0.7	0.4	0.4	0.9	0.6
1,500 to 1,999	1.1	1.2	1.3	1.2	1.3	1.1	1.2	2.0	1.2
2,000 to 2,499	4.0	3.5	3.7	3.7	3.8	3.8	3.5	7.1	3.8
500 to 2,499	**6.3**	**5.8**	**6.2**	**6.1**	**6.4**	**6.0**	**5.4**	**10.9**	**6.1**
2,500 to 2,999	15.0	15.4	15.4	15.5	15.6	15.2	15.2	22.9	15.3
3,000 to 3,499	37.8	37.5	36.0	37.4	37.1	37.1	37.7	37.9	37.3
3,500 to 3,999	30.0	30.3	30.6	30.5	30.3	30.4	30.7	21.3	30.2
4,000 and over	11.0	11.0	11.9	10.5	10.6	11.3	11.0	6.9	11.1

(a) Includes live births and fetal deaths (stillbirths) with known birthweight of at least 500g.

Source: AIHW National Perinatal Statistics Unit, derived from data provided by State and Territory health authorities

Mortality

Table S10: Deaths by age group and sex, State or Territory of usual residence, 1990

(Number)

Age group (years)	*NSW*	*Vic*	*Qld*	*WA*	*SA*	*Tas*	*ACT*	*NT*	*Aust*
Males									
Under 1	425	305	190	118	92	35	27	32	1,224
1–4	86	71	43	21	17	4	3	11	256
5–9	55	32	37	10	7	4	2	3	150
10–14	35	29	33	12	15	5	4	2	135
15–19	232	153	127	58	59	22	11	14	676
20–24	295	226	173	93	94	26	16	27	950
25–29	374	236	137	88	96	29	8	30	998
30–34	343	232	152	90	87	36	10	26	976
35–39	340	234	161	83	74	30	11	33	966
40–44	490	327	215	128	105	32	26	34	1,357
45–49	604	355	286	124	112	42	21	31	1,575
50–54	849	510	373	186	191	77	33	34	2,253
55–59	1,326	862	595	267	275	99	36	43	3,503
60–64	2,161	1,483	963	465	539	181	65	42	5,899
65–69	2,945	2,074	1,373	659	775	256	84	51	8,217
70–74	3,441	2,287	1,372	615	847	316	69	29	8,976
75–79	3,812	2,680	1,719	830	955	333	69	31	10,429
80–84	3,101	2,168	1,409	659	778	278	49	26	8,468
85–89	1,754	1,381	898	459	466	158	33	8	5,157
90 and over	833	674	438	186	249	83	17	5	2,485
All ages(a)	**23,501**	**16,319**	**10,694**	**5,151**	**5,833**	**2,046**	**594**	**512**	**64,650**
Females									
Under 1	308	218	155	99	76	28	15	22	921
1–4	58	34	31	18	9	11	3	4	168
5–9	35	21	14	7	3	4	2	2	88
10–14	29	28	10	7	13	4	1	2	94
15–19	89	67	50	26	15	9	5	4	265
20–24	106	78	43	26	25	7	4	9	298
25–29	109	80	47	32	29	9	8	11	325
30–34	122	96	59	45	35	8	3	7	375
35–39	152	122	102	46	43	12	9	13	499
40–44	244	165	136	71	49	19	10	11	705
45–49	336	210	142	72	64	30	22	16	892
50–54	474	326	240	115	91	32	17	15	1,310
55–59	652	441	293	143	152	63	18	29	1,791
60–64	1,054	789	480	248	284	96	40	27	3,018
65–69	1,736	1,212	756	330	434	134	47	22	4,671
70–74	2,390	1,566	1,002	390	591	176	41	17	6,173
75–79	3,213	2,265	1,298	672	820	276	86	20	8,650
80–84	3,412	2,579	1,384	744	865	285	74	18	9,361
85–89	3,091	2,322	1,255	653	798	240	57	14	8,430
90 and over	2,697	2,046	1,130	510	709	224	46	5	7,367
All ages(a)	**20,307**	**14,665**	**8,627**	**4,254**	**5,105**	**1,667**	**508**	**268**	**55,401**

(a) Includes 'not stated'.

Source: Australian Bureau of Statistics 1991b; Australian Bureau of Statistics (unpublished)

Table S11: Life expectancy at selected ages by sex, States and Territories, 1990

(Years)

	At birth		*At age 15*		*At age 65*	
State / Territory	*Males*	*Females*	*Males*	*Females*	*Males*	*Females*
New South Wales	73.4	79.8	59.4	65.6	14.9	18.8
Victoria	74.3	80.2	60.2	66.0	15.2	19.0
Queensland	74.1	80.2	60.1	66.0	15.5	19.3
Western Australia	74.9	80.6	60.9	66.5	15.8	19.6
South Australia	74.1	80.2	60.0	66.0	15.4	19.1
Tasmania	72.4	79.1	58.4	65.2	14.2	18.7
Australian Capital Territory	74.8	79.9	61.0	65.7	15.5	18.7
Northern Territory	66.0	73.3	52.9	59.6	12.4	16.2
Australia	**73.9**	**80.0**	**59.8**	**65.8**	**15.2**	**19.0**

Sources: Australian Bureau of Statistics 1991b
Australian Bureau of Statistics unpublished

Table S12: Life expectancy at selected ages by sex, 1901 to 1990

(Years)

	At birth		*At age 15*		*At age 65*	
	Males	*Females*	*Males*	*Females*	*Males*	*Females*
Annual averages						
1901–1910	55.2	58.8	49.0	51.9	11.3	12.9
1920–1922	59.2	63.3	51.4	54.6	12.0	13.6
1946–1948	66.1	70.6	54.3	58.3	12.3	14.4
1960–1962	67.9	74.2	55.1	61.0	12.5	15.7
1980–1982	71.2	78.3	57.4	64.3	13.8	18.0
Annual rates						
1986	72.9	79.2	58.8	65.0	14.6	18.5
1987	73.0	79.5	59.1	65.3	14.7	18.6
1988	73.1	79.5	59.1	65.3	14.8	18.7
1989	73.3	79.6	59.3	65.4	14.7	18.7
1990	73.9	80.0	59.8	65.8	15.2	19.0

Sources: Commonwealth Bureau of Census and Statistics 1970b
Office of the Australian Government Actuary 1985
Australian Bureau of Statistics 3302.0

Table S13: Life expectancy at selected ages, selected countries, latest year

(Years)

	At birth		*At age 15*		*At age 65*	
Country and year	*Males*	*Females*	*Males*	*Females*	*Males*	*Females*
Australia (1990)	**73.9**	**80.0**	**59.8**	**65.8**	**15.2**	**19.0**
Canada (1989)	73.7	80.6	59.6	66.3	15.3	19.8
Chile (1987)	70.0	75.7	57.0	62.4	13.7	16.7
East Germany (1989)	70.1	76.4	56.0	62.1	12.8	15.9
France (1989)	73.1	81.5	59.0	67.2	15.8	20.5
Greece (1989)	74.3	79.4	60.4	65.3	15.6	17.9
Iceland (1990)	75.4	80.7	61.3	66.4	16.4	19.8
Ireland (1989)	71.7	77.2	57.6	62.9	13.0	16.5
Israel (1988)	73.9	77.6	60.0	63.6	15.2	16.9
Italy (1988)	73.3	79.9	59.3	65.7	14.7	18.7
Japan (1990)	76.2	82.5	61.8	68.0	16.5	20.6
Malta (1990)	73.8	78.4	59.9	64.2	14.2	17.1
Netherlands (1989)	73.7	80.1	59.5	65.8	14.3	19.1
New Zealand (1987)	71.4	77.3	57.6	63.3	14.0	17.7
Norway (1989)	73.3	80.0	59.3	65.7	14.7	18.9
Poland (1990)	66.5	75.6	53.1	61.9	12.5	16.2
Spain (1987)	73.6	80.3	59.6	66.2	15.6	19.1
Sweden (1988)	74.2	80.1	59.9	65.7	15.0	18.8
Switzerland (1990)	74.0	81.0	59.8	66.7	15.3	19.7
United Kingdom (1990)	73.0	78.7	58.9	64.4	14.2	18.1
USA (1988)	71.6	78.6	57.7	64.6	15.0	18.9
USSR (1990)	64.2	73.9	51.7	61.1	12.4	16.0
West Germany (1989)	72.6	79.2	58.5	64.9	14.2	18.2
Yugoslavia (1989)	69.0	74.8	56.2	61.9	13.4	15.9

Sources: World Health Organization 1991, 1992
Australian Bureau of Statistics 1991b

Table S14: Age-specific death rates, all causes by sex, selected years, 1921 to 1990

(Per 100,000 population)

Sex / Age group (years)	*1921*	*1941*	*1961*	*1981*	*1986*	*1990*
Males						
0–4	2,213	1,289	564	281	244	231
5–9	200	139	49	34	25	23
10–14	172	108	52	29	29	21
15–19	219	159	123	124	106	94
20–24	321	205	161	153	153	137
25–29	373	199	146	133	131	139
30–34	442	232	169	123	132	138
35–39	584	339	229	165	143	147
40–44	730	461	380	261	227	209
45–49	994	737	588	455	351	311
50–54	1,299	1,161	992	790	626	534
55–59	1,895	1,775	1,614	1,294	1,070	955
60–64	2,878	2,774	2,619	1,983	1,794	1,610
65–69	4,199	4,251	4,117	3,231	2,832	2,609
70–74	6,199	6,479	6,252	5,195	4,537	4,149
75–79	10,076	10,054	9,312	8,018	7,206	6,682
80–84	15,368	15,264	14,084	12,112	11,055	10,364
85 and over	26,213	29,453	23,772	20,814	18,722	18,142
Crude rate	**1,106**	**1,099**	**946**	**815**	**778**	**758**
ASR[(a)]	**1,689**	**1,532**	**1,317**	**1,075**	**953**	**885**
Females						
0–4	1,771	1,022	443	216	189	178
5–9	192	103	38	18	18	14
10–14	128	73	30	20	16	16
15–19	205	104	47	45	41	39
20–24	290	155	61	48	54	45
25–29	377	202	74	51	49	46
30–34	426	234	92	57	57	54
35–39	535	311	146	87	76	76
40–44	563	374	209	143	135	113
45–49	690	565	347	265	217	186
50–54	943	780	542	378	353	326
55–59	1,289	1,103	785	617	573	502
60–64	1,915	1,805	1,298	971	883	818
65–69	3,112	2,884	2,178	1,568	1,508	1,331
70–74	5,041	4,789	3,652	2,552	2,479	2,286
75–79	8,295	8,275	6,271	4,426	4,107	3,861
80–84	13,136	12,704	10,241	7,597	7,113	6,630
85 and over	22,345	25,457	20,670	16,035	14,825	14,656
Crude rate	**873**	**901**	**745**	**646**	**658**	**648**
ASR[(a)]	**1,356**	**1,187**	**845**	**611**	**570**	**532**

(a) Age-standardised rates. Reference population is the 30 June 1988 Australian population.

Sources: d'Espaignet et al. 1991
Australian Institute of Health and Welfare

Table S15: Age-specific death rates, all causes by State or Territory of usual residence, 1990

(Per 100,000 population)

Sex / Age group (years)	*NSW*	*Vic*	*Qld*	*WA*	*SA*	*Tas*	*ACT*	*NT*	*Aust*
Males									
0–4	232	233	215	214	216	219	278	523	231
5–9	25	20	32	15	13	22	18	40	23
10–14	17	18	29	19	30	28	35	28	21
15–19	97	83	98	85	103	114	81	203	94
20–24	133	123	142	136	158	154	105	332	137
25–29	157	129	113	120	155	163	56	367	139
30–34	143	128	130	126	146	195	79	351	138
35–39	153	141	147	124	136	174	92	481	147
40–44	221	201	197	199	195	194	212	489	209
45–49	345	278	330	256	274	322	241	624	311
50–54	574	469	533	472	555	695	504	958	534
55–59	1,023	900	993	806	871	1,016	732	2,018	955
60–64	1,654	1,557	1,606	1,482	1,607	1,818	1,634	2,396	1,610
65–69	2,603	2,601	2,569	2,509	2,631	2,969	2,678	4,489	2,609
70–74	4,397	4,212	3,664	3,581	4,123	5,117	3,879	4,227	4,149
75–79	6,913	6,655	6,516	6,296	6,311	7,395	6,101	9,841	6,682
80–84	11,121	10,043	10,037	9,144	9,967	11,365	8,734	14,607	10,364
85 and over	18,460	18,126	18,306	16,564	17,786	20,184	17,668	15,476	18,142
Crude rate	**810**	**750**	**733**	**624**	**814**	**902**	**413**	**626**	**758**
ASR[(a)]	**921**	**867**	**863**	**802**	**866**	**1,002**	**814**	**1,304**	**885**
Females									
0–4	175	164	180	191	177	231	169	328	178
5–9	17	14	13	11	6	22	18	28	14
10–14	14	19	9	12	28	24	9	32	16
15–19	39	38	41	40	27	48	38	63	39
20–24	50	44	37	40	44	42	28	120	45
25–29	47	44	40	46	49	51	63	139	46
30–34	52	54	51	65	60	44	25	91	54
35–39	68	73	93	70	78	71	73	198	76
40–44	115	104	128	119	94	116	84	189	113
45–49	203	171	173	161	161	240	261	411	186
50–54	337	312	364	312	266	297	276	567	326
55–59	515	473	502	453	490	652	415	1,705	502
60–64	794	817	799	812	841	964	1,005	1,993	818
65–69	1,357	1,332	1,332	1,178	1,315	1,365	1,310	2,304	1,331
70–74	2,426	2,272	2,239	1,829	2,306	2,248	1,739	2,568	2,286
75–79	4,000	3,828	3,611	3,657	3,789	4,266	4,859	5,797	3,861
80–84	6,773	6,744	6,272	6,354	6,332	7,235	7,385	9,326	6,630
85 and over	15,400	14,632	13,819	13,128	14,275	16,560	13,957	14,286	14,656
Crude rate	**695**	**665**	**596**	**526**	**707**	**725**	**360**	**356**	**648**
ASR[(a)]	**549**	**527**	**515**	**489**	**519**	**584**	**541**	**824**	**532**

(a) Age-standardised rates. Reference population is the 30 June 1988 Australian population.

Source: Australian Institute of Health and Welfare

Table S16: Age-specific death rates, all causes, males, selected countries, latest year

(Per 100,000 population)

	Age group (years)					
Country and year	(a) *0*	*1–4*	*5–14*	*15–24*	*25–34*	*35–44*
Australia (1990)	905	50	22	115	139	178
Canada (1989)	798	44	24	118	134	195
East Germany (1989)	890	43	28	101	142	289
France (1989)	863	45	24	117	171	276
Greece (1989)	1,084	42	23	104	113	185
Iceland (1990)	697	47	23	131	129	148
Ireland (1989)	931	55	26	94	102	184
Israel (1988)	1,033	53	27	79	106	162
Italy (1988)	1,015	35	22	89	110	173
Japan (1990)	498	52	20	70	78	155
Malta (1990)	1,113	46	21	47	59	94
Netherlands (1989)	765	42	21	64	78	156
New Zealand (1987)	1,074	59	39	175	153	190
Norway (1989)	883	51	22	100	99	196
Poland (1990)	1,787	68	34	133	232	475
Spain (1987)	1,009	45	28	114	141	224
Sweden (1988)	657	31	20	81	115	196
Switzerland (1990)	736	49	20	130	164	194
United Kingdom (1990)	884	43	22	85	98	177
USA (1988)	1,099	57	31	151	197	301
USSR (1990)	2,476	195	64	178	334	591
West Germany (1989)	845	43	22	87	113	214
Yugoslavia (1989)	2,456	86	35	88	143	297

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Table S16: Age-specific death rates, all causes, males, selected countries, latest year (continued)

(Per 100,000 population)

Country and year	*Age group (years)*				*Crude rate*	*ASR*(b)
	45–54	*55–64*	*65–74*	*75 and over*		
Australia (1990)	**413**	**1,282**	**3,236**	**9,482**	**758**	**927**
Canada (1989)	467	1,365	3,353	9,792	806	953
East Germany (1989)	744	1,845	4,396	13,578	1,144	1,314
France (1989)	633	1,475	2,917	9,590	1,002	968
Greece (1989)	439	1,200	3,011	9,975	985	923
Iceland (1990)	353	1,058	2,946	9,213	712	816
Ireland (1989)	508	1,605	4,508	12,700	972	1,198
Israel (1988)	463	1,333	3,319	9,754	696	950
Italy (1988)	490	1,455	3,479	10,393	1,007	1,011
Japan (1990)	406	1,079	2,520	9,169	737	815
Malta (1990)	396	1,367	3,641	11,482	796	1,016
Netherlands (1989)	438	1,375	3,648	11,565	914	1,021
New Zealand (1987)	562	1,548	4,100	11,067	883	1,117
Norway (1989)	484	1,409	3,537	10,973	1,131	1,010
Poland (1990)	1,174	2,520	4,937	12,973	1,127	1,517
Spain (1987)	538	1,295	3,151	9,644	863	946
Sweden (1988)	439	1,256	3,265	10,832	1,211	966
Switzerland (1990)	412	1,181	3,112	10,470	991	944
United Kingdom (1990)	478	1,476	3,948	10,935	1,123	1,042
USA (1988)	629	1,607	3,574	10,122	940	1,059
USSR (1990)	1,348	2,706	5,104	12,475	1,074	1,604
West Germany (1989)	572	1,495	3,605	11,341	1,091	1,077
Yugoslavia (1989)	818	1,986	4,184	11,783	971	1,273

(a) Infant mortality per 100,000 live births.

(b) Age-standardised rate. Reference population is the European standard population (WHO 1992). Standard death rates in this table are different to the standard rates in other tables because of the use of a different reference population.

Sources: World Health Organization 1991, 1992
Australian Institute of Health and Welfare

Table S17: Age-specific death rates, all causes, females, selected countries, latest year

(Per 100,000 population)

	Age group (years)					
Country and year	(a) *0*	*1–4*	*5–14*	*15–24*	*25–34*	*35–44*
Australia (1990)	723	35	15	42	50	94
Canada (1989)	621	37	18	41	53	107
East Germany (1989)	619	39	15	42	63	130
France (1989)	640	37	19	41	62	121
Greece (1989)	864	32	19	36	47	87
Iceland (1990)	473	—	10	24	43	94
Ireland (1989)	689	34	16	33	40	99
Israel (1988)	983	47	18	29	45	102
Italy (1988)	818	29	15	29	42	96
Japan (1990)	419	37	13	27	40	89
Malta (1990)	775	29	18	4	26	87
Netherlands (1989)	588	37	16	34	45	104
New Zealand (1987)	949	52	23	62	72	129
Norway (1989)	690	32	12	29	52	101
Poland (1990)	1,404	50	22	36	64	168
Spain (1987)	757	39	18	42	51	101
Sweden (1988)	501	26	12	34	51	115
Switzerland (1990)	629	31	16	40	57	100
United Kingdom (1990)	682	33	15	30	45	113
USA (1988)	886	45	20	52	74	140
USSR (1990)	1,901	163	35	66	94	190
West Germany (1989)	639	34	15	35	50	119
Yugoslavia (1989)	2,240	80	25	41	65	139

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Table S17: Age-specific death rates, all causes, females, selected countries, latest year (continued)

(Per 100,000 population)

	Age group (years)					
Country and year	*45–54*	*55–64*	*65–74*	*75 and over*	*Crude rate*	*ASR*[(b)]
Australia (1990)	250	663	1,746	7,147	648	561
Canada (1989)	278	706	1,724	6,951	653	554
East Germany (1989)	353	917	2,562	10,471	1,322	828
France (1989)	262	553	1,236	7,191	886	506
Greece (1989)	207	553	1,815	8,680	866	632
Iceland (1990)	328	762	1,634	7,338	626	555
Ireland (1989)	319	939	2,564	9,693	855	769
Israel (1988)	270	822	2,414	8,716	618	726
Italy (1988)	245	622	1,705	7,856	874	593
Japan (1990)	205	466	1,268	6,431	603	471
Malta (1990)	243	778	2,008	9,714	735	704
Netherlands (1989)	277	674	1,679	7,893	823	581
New Zealand (1987)	386	929	2,338	8,376	776	717
Norway (1989)	245	688	1,697	8,196	1,011	590
Poland (1990)	413	1,018	2,545	9,882	917	833
Spain (1987)	238	554	1,583	7,588	741	566
Sweden (1988)	265	636	1,727	8,072	1,084	587
Switzerland (1990)	241	539	1,443	7,712	910	535
United Kingdom (1990)	299	881	2,241	8,307	1,113	659
USA (1988)	351	905	2,056	7,633	827	642
USSR (1990)	481	1,122	2,740	9,709	1,001	893
West Germany (1989)	286	697	1,829	8,297	1,154	635
Yugoslavia (1989)	376	955	2,582	9,832	849	857

(a) Infant mortality per 100,000 live births.

(b) Age-standardised rate. Reference population is the European standard population (WHO 1992). Standard death rates in this table are different to the standard rates in other tables because of the use of a different reference population.

Sources: World Health Organization 1991, 1992
Australian Institute of Health and Welfare

Table S18: Age-standardised death rates[a] by sex and ICD-9 chapter, selected years, 1921 to 1990

(Per 100,000 population)

Sex / ICD-9 chapter	*1921*	*1941*	*1961*	*1981*	*1986*	*1987*	*1988*	*1989*	*1990*
Males									
Infectious and parasitic	208	92	17	5	5	5	6	6	6
Neoplasms	154	175	192	236	234	234	238	237	232
Endocrine, nutritional	16	23	16	18	19	21	19	21	23
Blood diseases	10	5	4	3	4	4	3	3	3
Mental disorders	7	4	5	9	12	13	15	15	14
Nervous system diseases	46	25	14	13	14	15	16	16	15
Circulatory diseases	376	614	733	545	446	435	417	414	383
Respiratory diseases	201	145	105	94	82	84	86	95	79
Digestive diseases	58	56	38	35	31	31	31	32	29
Genitourinary diseases	122	133	42	15	13	13	9	13	13
Skin diseases	5	3	2	1	1	1	1	1	1
Musculoskeletal diseases	7	5	4	3	3	3	4	3	3
Congenital anomalities	9	10	10	7	5	5	6	5	5
Perinatal conditions	55	43	21	7	6	6	6	6	6
Ill-defined conditions	300	98	14	6	6	6	6	6	6
Injury and poisoning	116	103	103	80	71	73	75	70	68
All causes	**1,689**	**1,532**	**1,317**	**1,075**	**953**	**947**	**941**	**944**	**885**
Females									
Infectious and parasitic	157	58	9	3	3	3	3	4	4
Neoplasms	155	159	135	133	141	137	140	139	138
Endocrine, nutritional	26	40	20	15	14	15	14	14	14
Blood diseases	13	6	4	3	2	3	2	2	2
Mental disorders	3	3	2	6	9	9	10	11	10
Nervous system diseases	36	21	9	8	10	10	11	12	11
Circulatory diseases	334	503	493	333	284	277	265	267	248
Respiratory diseases	155	111	43	31	31	33	35	42	34
Digestive diseases	56	39	23	19	20	20	20	19	19
Genitourinary diseases	65	74	19	11	10	10	10	10	10
Complications of pregnancy	24	14	3	—	—	—	—	—	—
Skin diseases	5	3	2	—	1	1	1	1	1
Musculoskeletal diseases	9	6	4	4	4	4	4	5	4
Congenital anomalities	7	9	8	6	5	5	5	5	5
Perinatal conditions	41	34	15	5	5	4	5	5	5
Ill-defined conditions	237	70	14	4	4	4	4	4	4
Injury and poisoning	34	39	42	30	28	27	28	27	25
All causes	1,357	1,187	845	611	570	561	557	563	532

(a) Reference population is the 30 June 1988 Australian population, classified by five-year age groups.

Sources: d'Espaignet et al. 1991
Australian Institute of Health and Welfare

Table S19: Age-standardised death rates[a] by sex and ICD-9 chapter, States and Territories, 1990

(Per 100,000 population)

Sex / ICD-9 chapter	*NSW*	*Vic*	*Qld*	*WA*	*SA*	*Tas*	*ACT*	*NT*	*Aust*
Males									
Infectious and parasitic	8	4	5	4	6	6	5	21	6
Neoplasms	236	240	220	213	227	263	236	229	232
Endocrine, nutritional	25	29	17	19	17	17	30	41	23
Blood diseases	4	3	4	3	3	3	7	1	3
Mental disorders	16	14	13	10	9	18	6	22	14
Nervous system diseases	13	17	16	15	14	20	14	22	15
Circulatory diseases	408	359	377	346	386	430	319	412	383
Respiratory diseases	79	77	76	72	82	100	77	228	79
Digestive diseases	31	28	29	25	25	26	26	48	29
Genitourinary diseases	13	14	14	12	11	9	17	26	13
Skin diseases	1	—	1	1	1	—	—	—	1
Musculoskeletal diseases	3	4	3	2	3	2	6	—	3
Congenital anomalies	5	5	4	7	5	6	7	10	5
Perinatal conditions	6	6	6	5	5	5	8	13	6
Ill-defined conditions	6	5	4	6	6	14	9	8	6
Injury and poisoning	66	62	74	64	68	84	49	225	68
All causes	**921**	**867**	**863**	**802**	**866**	**1,002**	**814**	**1,304**	**885**
Females									
Infectious and parasitic	4	3	4	3	3	2	—	24	4
Neoplasms	137	145	125	133	143	147	163	144	138
Endocrine, nutritional	12	17	12	14	12	9	14	52	14
Blood diseases	3	2	2	1	2	2	—	—	2
Mental disorders	10	12	8	7	8	13	8	6	10
Nervous system diseases	10	13	10	15	10	10	13	10	11
Circulatory diseases	267	234	249	218	240	264	216	268	248
Respiratory diseases	33	32	31	31	36	57	40	141	34
Digestive diseases	19	18	19	19	18	19	25	45	19
Genitourinary diseases	11	8	11	7	7	7	17	38	10
Complications of pregnancy	—	—	—	—	—	—	—	1	—
Skin diseases	1	—	1	1	1	—	1	3	1
Musculoskeletal diseases	4	5	4	1	4	8	1	12	4
Congenital anomalies	5	5	5	5	5	4	4	4	5
Perinatal conditions	5	5	3	4	5	3	4	8	5
Ill-defined conditions	4	3	3	4	5	14	5	9	4
Injury and poisoning	24	25	28	25	22	25	32	58	25
All causes	549	527	515	489	519	584	541	824	532

(a) Reference population is the 30 June 1988 Australian population, classified by five-year age groups.

Source: Australian Institute of Health and Welfare

Table S20: Age-standardised death rates[a] by selected ICD-9 chapters, males, selected countries, latest year

(Per 100,000 population)

	ICD-9 chapter						
Country and year	*Infectious & parasitic*	*Neoplasms*	*Circulatory*	*Respiratory*	*Digestive*	*Injury & poisoning*	*All causes*
Australia (1990)	**6**	**247**	401	**81**	31	67	**927**
Canada (1989)	6	260	382	88	35	75	953
Chile (1987)	39	215	354	148	85	129	1,189
East Germany (1989)	5	246	689	92	65	95	1,314
France (1989)	12	303	280	64	54	104	968
Greece (1989)	6	218	432	50	29	67	923
Iceland (1990)	4	227	360	78	8	78	816
Ireland (1989)	7	266	562	172	30	65	1,198
Israel (1988)	16	177	406	67	27	68	950
Italy (1988)	5	293	402	78	62	62	1,011
Japan (1990)	13	228	277	114	39	61	815
Malta (1990)	10	213	474	110	50	40	1,016
Netherlands (1989)	5	304	400	98	31	45	1,021
New Zealand (1987)	5	259	517	130	28	85	1,117
Norway (1989)	6	226	460	89	29	82	1,010
Poland (1990)	13	296	768	76	46	133	1,517
Singapore (1989)	40	293	455	258	32	55	1,244
Spain (1987)	11	244	355	94	63	68	946
Sweden (1988)	6	203	487	76	30	74	966
Switzerland (1990)	15	263	377	80	28	95	944
UK (1990)	5	276	469	118	30	48	1,042
USA (1988)	14	246	456	95	38	90	1,059
USSR (1990)	26	284	800	127	47	198	1,604
West Germany (1989)	8	280	484	78	54	61	1,077
Yugoslavia (1989)	17	227	631	68	54	91	1,273

(a) Reference population is the European standard population (WHO 1992). Standard death rates in this table are different to the standard rates in other tables because of the use of a different reference population.

Sources: World Health Organization 1991, 1992
Australian Institute of Health and Welfare

Table S21: Age-standardised death rates[a] by selected ICD-9 chapters, females, selected countries, latest year

(Per 100,000 population)

	ICD-9 chapter						
Country and year	*Infectious & parasitic*	*Neoplasms*	*Circulatory*	*Respiratory*	*Digestive*	*Injury & poisoning*	*All causes*
Australia (1990)	**4**	**150**	**258**	**36**	**20**	**26**	**561**
Canada (1989)	4	162	221	42	21	30	554
Chile (1987)	24	171	264	89	47	34	797
East Germany (1989)	3	150	474	34	34	42	828
France (1989)	7	132	167	29	28	45	506
Greece (1989)	4	116	340	31	15	26	632
Iceland (1990)	4	177	225	69	13	24	555
Ireland (1989)	5	196	349	97	23	26	769
Israel (1988)	13	149	313	46	20	36	726
Italy (1988)	2	148	268	29	30	27	593
Japan (1990)	6	114	189	50	19	27	471
Malta (1990)	6	131	383	37	19	22	704
Netherlands (1989)	4	164	221	35	24	25	581
New Zealand (1987)	5	186	322	72	20	36	717
Norway (1989)	5	150	252	55	19	34	590
Poland (1990)	5	154	462	26	26	36	833
Singapore (1989)	25	157	320	130	18	25	789
Spain (1987)	6	119	260	39	29	22	566
Sweden (1988)	5	146	275	43	19	32	587
Switzerland (1990)	6	147	225	37	16	40	535
UK (1990)	3	186	281	65	24	19	659
USA (1988)	10	161	283	51	24	32	642
USSR (1990)	10	134	534	50	24	50	893
West Germany (1989)	5	167	301	29	30	27	635
Yugoslavia (1989)	11	130	490	36	24	34	857

(a) Reference population is the European standard population (WHO 1992). Standard death rates in this table are different to the standard rates in other tables because of the use of a different reference population.

Sources: World Health Organization 1991, 1992
Australian Institute of Health and Welfare

Table S22: Infant mortality rates, States and Territories[a], selected years, 1901 to 1990

(Per 1,000 live births)

Year	*NSW*	*Vic*	*Qld*	*WA*	*SA*	*Tas*	*ACT*	*NT*	*Aust*
1901	103.7	102.9	101.9	128.9	100.0	89.0	(b)	62.5	103.6
1921	62.6	72.6	54.2	78.3	65.5	78.0	74.0	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	10.3	9.3	10.4	8.9	8.0	12.3	8.9	23.5	10.0
1986	9.0	8.6	8.7	8.8	7.4	11.4	8.5	16.0	8.8
1987	8.5	8.1	9.3	8.4	8.6	10.0	9.0	15.6	8.7
1988	9.2	7.8	8.4	8.5	7.9	9.6	8.1	(c)19.2	8.7
1989	8.7	6.5	8.5	7.8	7.4	10.6	6.5	14.5	8.0
1990	8.1	7.8	7.7	8.6	8.5	8.9	9.4	15.2	8.2

(a) Calculated in respect of the State or Territory of usual residence of the deceased.

(b) Part of New South Wales prior to 1911.

(c) Northern Territory rate for 1988 was affected by changed registration requirements.

Sources: Commonwealth Bureau of Census and Statistics 1908, 1922, 1943, 1962
Australian Bureau of Statistics 3302.0

Table S23: Perinatal mortality rates[a], States and Territories, 1981 to 1990[b]

(Per 1,000 live births plus fetal deaths)

Year	*NSW*	*Vic*	*Qld*	*WA*	*SA*	*Tas*	*ACT*	*NT*	*Aust*
1981	13.8	13.3	13.0	12.4	10.6	13.2	10.1	27.9	13.2
1982	13.5	14.5	12.5	11.6	12.8	11.0	11.1	27.1	13.4
1983	12.1	12.5	12.1	10.8	11.3	12.9	11.5	21.1	12.2
1984	12.4	11.7	11.4	12.0	10.3	12.5	9.2	19.5	11.9
1985	11.2	12.2	12.0	10.8	12.4	13.8	10.9	17.4	11.8
1986	11.5	11.7	10.9	11.0	10.1	15.7	10.7	19.7	11.5
1987	10.8	10.2	11.0	10.6	8.8	9.4	10.9	19.0	10.6
1988	11.1	10.1	10.6	9.0	10.0	13.0	11.0	19.9	10.7
1989	10.3	9.3	9.7	8.8	10.1	11.0	9.6	21.1	9.9
1990	10.5	10.5	9.3	9.3	10.2	10.0	12.0	17.0	10.3

(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.

(b) Comparable perinatal mortality data are not available before 1973.

Source: Australian Bureau of Statistics 3304.0

Table S24: Neonatal, postneonatal and infant mortality rates[a], by sex, selected countries, latest year

(Per 1,000 live births)

	Neonatal			*Postneonatal*			*Infant*		
Country and year	*Male*	*Female*	*Persons*	*Male*	*Female*	*Persons*	*Male*	*Female*	*Persons*
Australia (1990)	**5.4**	**4.3**	**4.9**	**3.7**	**2.9**	**3.3**	**9.1**	**7.2**	**8.2**
Canada (1988)	5.0	4.1	4.6	3.0	2.2	2.6	8.0	6.3	7.2
Chile (1988)	10.5	8.5	9.5	10.1	8.6	9.4	20.6	17.1	18.9
GDR (1989)	na	na	na	na	na	na	8.9	6.2	7.6
France (1989)	4.3	3.4	3.8	4.3	3.0	3.7	8.6	6.4	7.5
Greece (1989)	7.3	5.9	6.6	3.5	2.8	3.2	10.8	8.6	9.8
Iceland (1990)	4.9	3.0	4.0	2.1	1.7	1.9	7.0	4.7	5.9
Ireland (1989)	5.5	4.1	4.8	3.9	2.8	3.3	9.3	6.9	8.1
Israel (1988)	6.8	6.4	6.6	3.5	3.4	3.5	10.3	9.8	10.1
Italy (1988)	7.9	6.3	7.2	2.3	1.8	2.1	10.2	8.2	9.2
Japan (1990)	2.8	2.4	2.6	2.2	1.8	2.0	5.0	4.2	4.6
Malta (1990)	8.3	5.0	6.7	2.9	2.7	2.8	11.1	7.7	9.5
Netherlands (1989)	5.1	4.0	4.6	2.5	1.9	2.2	7.7	5.9	6.8
NZ (1987)	4.9	3.6	4.3	5.9	5.9	5.9	10.7	9.5	10.1
Norway (1989)	4.0	3.9	3.9	4.9	3.0	4.0	8.8	6.9	7.9
Poland (1990)	13.1	10.0	11.6	4.8	4.0	4.4	17.9	14.0	16.0
Singapore (1989)	5.0	4.1	4.6	2.0	2.0	2.0	7.0	6.1	6.6
Spain (1987)	6.8	5.0	6.0	3.3	2.5	2.9	10.1	7.6	8.9
Sweden (1988)	4.3	3.0	3.7	2.2	2.0	2.1	6.6	5.0	5.8
Switzerland (1990)	4.0	3.5	3.8	3.3	2.8	3.0	7.4	6.3	6.8
UK (1990)	5.0	4.0	4.5	3.8	2.8	3.3	8.8	6.8	7.9
USA (1988)	7.0	5.7	6.3	4.0	3.2	3.6	11.0	8.9	10.0
USSR (1990)	na	na	na	na	na	na	24.8	19.0	22.0
W Germany (1989)	4.6	3.4	4.0	3.9	3.0	3.5	8.5	6.4	7.4
Yugoslavia (1988)	15.0	11.9	13.5	11.0	11.0	11.0	26.0	22.9	24.5

(a) Neonatal: Less than 28 days.
Postneonatal: 28 to 364 days.
Infant: Less than one year.

Sources: World Health Organization 1991, 1992
United Nations 1991b
Australian Bureau of Statistics 1991a, 1991b

Table S25: Maternal deaths and death rates[(a)], by triennium, 1964–1966 to 1985–1987

Triennium	*Total confinements*	*Direct deaths*[(b)]	*Indirect deaths*[(c)]	*Incidental deaths*[(d)]	*Total deaths*[(e)]	*Maternal death rates* Direct	*Maternal death rates* Total
	(Number)	*(Number)*	*(Number)*	*(Number)*	*(Number)*	*(Per 100,000 confinements)*	
1964–1966	667,649	202	—	—	275	30	41
1967–1969	713,064	166	—	—	237	23	33
1970–1972	790,818	150	—	—	244	19	31
1973–1975	726,690	(f)60	32	45	137	8	19
1976–1978	678,098	52	35	19	106	8	16
1979–1981	682,880	54	34	9	(g)98	8	14
1982–1984	713,985	42	25	27	94	6	13
1985–1987	726,642	32	30	24	86	4	12

(a) Maternal mortality as defined by the World Health Organization is the death of a woman during pregnancy, childbirth or in the forty-two days of the puerperium, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management. This definition includes deaths from abortion and ectopic pregnancy, but excludes deaths from incidental causes. In this table, incidental deaths are included as are deaths occurring more than forty-two days after termination of the pregnancy, when they have their origin and illness related to the pregnancy.

(b) Direct maternal deaths are those resulting from obstetric complications of the pregnant state (pregnancy, labour and puerperium), from interventions, omissions, incorrect treatment, or from a chain of events resulting from any of the above—they are complications of the pregnancy itself, e.g. eclampsia, rupture of the uterus, postpartum hemorrhage.

(c) Indirect obstetric deaths are those resulting from pre-existing disease or disease that developed during pregnancy and was not due to direct obstetric causes, but which may have been aggravated by the physiological effects of pregnancy, e.g. heart disease, diabetes, renal disease.

(d) Incidental deaths due to causes such as road accidents, malignancies and suicide where the pregnancy is unlikely to have contributed significantly to the death.

(e) Prior to 1973–1975, no distinction was made between indirect and incidental deaths.

(f) Only 60 of the 69 certified causes of death were judged by the State maternal mortality committees as being direct maternal deaths.

(g) One death with inadequate data.

Source: National Health and Medical Research Council 1970, 1972, 1976, 1979, 1981, 1987, 1988, 1991

Table S26: Maternal death rates[(a)], selected countries, 1980 to 1989

(Per 100,000 live births)

Country	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*	*1988*	*1989*
Australia[(b)]	*9.8	*10.6	*10.4	*6.2	*7.7	*4.4	*6.2	*5.3	*4.9	na
Canada	*7.6	*6.2	*1.9	*5.4	*3.2	*4.0	*3.0	4.1	*4.8	na
Chile	74.9	43.8	51.8	40.3	34.7	50.0	47.3	48.3	na	na
East Germany	17.5	14.7	*12.5	15.8	18.4	16.7	*13.0	*12.4	14.8	na
France	12.9	15.5	13.8	15.1	14.2	12.0	10.9	9.6	9.4	8.5
Greece	*17.6	*11.4	*11.7	*14.3	*8.8	*6.9	*8.0	*4.7	*5.6	na
Iceland	na	na	na	na	na	na	na	*23.9	na	na
Ireland[(b)]	*6.8	*4.2	*5.7	*11.9	*6.2	*6.4	*4.9	*3.4	*1.8	na
Israel	*5.3	na	*3.1	*2.0	*5.1	*8.1	*6.0	*3.0	na	na
Italy	13.1	13.2	9.6	9.2	9.2	8.0	5.4	*4.5	7.7	na
Japan	20.5	19.2	*18.4	15.5	15.3	15.8	13.5	12.0	9.6	10.8
Netherlands	*8.8	*7.8	*6.4	*5.3	*9.7	*4.5	*8.1	*7.5	*9.6	*5.3
New Zealand[(b)]	*13.8	*5.9	*12.0	*19.8	*5.8	*13.5	*18.9	*12.7	na	na
Norway	*11.8	*2.0	na	*4.0	*2.0	*2.0	*3.8	*5.6	*3.5	na
Malta	na	*18.3	*32.9	na	na	*35.8	na	na	na	na
Philippines[(b)]	na	105.5	na	na	na	na	na	na	na	na
Poland	11.7	14.6	14.2	16.2	14.2	11.1	13.1	15.5	11.6	10.7
Singapore[(b)]	*4.9	*4.7	*11.7	*14.8	*12.0	*4.7	*13.0	*6.9	na	na
Spain	11.0	na	10.5	7.6	*5.2	*4.4	*5.5	na	na	na
Sweden	*8.2	*4.3	*4.3	na	*2.1	*5.1	*2.9	*4.8	*8.9	na
Switzerland	*5.4	*6.8	*12.0	*5.4	*1.3	*5.4	*3.9	*6.5	*10.0	*3.7
United Kingdom:										
England & Wales	10.7	9.0	6.7	8.6	8.2	7.0	6.8	6.8	5.9	na
Northern Ireland[(b)]	*7.0	*3.7	*7.4	*14.7	*10.8	na	na	*3.6	*3.6	na
Scotland[(b)]	*14.5	*18.8	*9.1	*12.3	*12.3	*13.5	*10.6	*3.0	*12.1	na
USA	9.2	8.5	7.9	8.0	7.8	7.8	7.2	6.6	8.4	na
USSR	na	na	na	na	na	na	13.6	12.4	10.6	na
West Germany	20.6	20.0	17.7	11.4	10.8	10.7	*8.0	8.7	8.9	5.3
Yugoslavia	17.8	26.6	22.4	16.8	17.2	16.4	14.7	10.6	16.3	15.5

(a) Data in this table are not directly comparable with those in Table S25. The number of maternal deaths reported in Table S25 have been adjusted after examination by State and Territory maternal mortality committees.

(b) Data tabulated by date of registration rather than occurrence.

* Rate based on 30 or fewer maternal deaths.

Source: United Nations 1992

Hospital morbidity and utilisation

Table S27: Separations from public acute hospitals[a] by principal diagnosis[b], States and Territories[c], 1987–88 or latest year

(Number)

ICD-9 chapter[d]	*NSW 1986*	*Vic 1987–88*	*Qld 1986*	*WA 1987*	*SA 1987–88*	*ACT 1987–88*	*NT 1987–88*
I	13,769	10,567	7,993	5,686	3,759	530	1,736
II	56,842	46,385	18,416	11,825	12,243	2,870	664
III	10,846	8,710	4,997	2,987	3,256	476	346
IV	7,384	6,790	2,652	2,221	2,125	343	222
V	21,032	8,932	16,177	6,657	5,551	956	972
VI	33,949	26,122	16,684	11,558	10,537	1,305	1,049
VII	85,475	49,274	32,656	20,307	22,504	3,070	1,062
VIII	61,663	41,490	30,657	23,841	21,678	2,293	2,829
IX	90,415	56,498	33,971	24,401	24,354	4,934	1,583
X	67,449	49,240	25,886	17,226	16,392	2,680	2,234
XI	110,171	74,307	46,781	26,351	26,807	6,464	4,831
XII	16,665	11,128	8,637	6,093	4,757	742	1,074
XIII	30,605	22,199	16,495	13,807	12,681	1,631	1,246
XIV	9,289	6,709	3,147	1,711	2,234	415	326
XV	13,062	8,307	3,778	1,902	2,551	1,735	1,001
XVI	51,526	27,585	33,425	19,707	18,505	1,469	1,714
XVII	89,201	51,331	50,311	29,099	26,949	2,607	3,947
Suppl.	75,448	51,929	42,720	37,690	33,044	9,127	3,066
Other	—	—	—	—	271	—	—
Total	**844,791**	**557,503**	**395,383**	**263,069**	**250,198**	**43,647**	**29,902**

(a) Does not include Department of Veterans' Affairs hospitals.

(b) Principal diagnosis grouped by ICD-9 chapters (WHO 1977).

(c) No data available for Tasmania.

(d) See Appendix 2 for an explanation of ICD-9 chapters.

Source: Australian Institute of Health and Welfare

Table S28: Occupied bed-days in public acute hospitals(a) by principal diagnosis(b), States and Territories(c), 1987–88 or latest year

(Number)

ICD-9 chapter(d)	*NSW 1986*	*Vic 1987–88*	*Qld 1986*	*WA 1987*	*SA 1987–88*	*ACT 1987–88*	*NT 1987–88*
I	64,825	47,137	36,678	25,137	19,670	3,435	15,243
II	537,579	338,333	180,244	101,115	116,804	21,271	5,377
III	100,124	73,806	45,027	24,992	31,266	3,872	3,072
IV	36,724	24,944	14,308	9,596	8,964	2,031	1,349
V	275,160	112,853	196,091	76,403	64,384	14,906	12,066
VI	222,749	140,165	96,406	63,556	60,820	7,073	6,652
VII	963,540	503,471	320,986	196,757	218,616	29,855	9,001
VIII	355,580	223,524	153,571	113,266	117,049	12,672	16,467
IX	499,518	276,748	176,321	112,003	126,519	20,659	9,209
X	310,999	196,313	122,623	71,922	75,576	10,684	10,381
XI	572,416	390,827	224,099	134,233	133,956	35,940	24,446
XII	134,405	77,721	68,362	42,310	43,744	3,021	9,331
XIII	279,082	182,306	124,869	96,855	87,390	12,791	7,678
XIV	58,101	36,921	21,590	9,977	12,402	2,562	2,503
XV	113,022	74,941	43,104	25,387	24,074	15,175	8,731
XVI	205,560	106,909	161,950	71,508	89,189	4,850	9,934
XVII	671,038	389,256	313,346	175,598	150,551	20,140	25,839
Suppl.	261,549	334,586	98,892	99,763	138,123	34,488	14,214
Other	—	—	—	—	1,928	—	—
Total	**5,661,971**	**3,530,761**	**2,398,467**	**1,450,378**	**1,521,025**	**255,425**	**191,493**

(a) Does not include Department of Veterans' Affairs hospitals.

(b) Principal diagnosis grouped by ICD-9 chapter (WHO 1977).

(c) No data available for Tasmania.

(d) See Appendix 2 for an explanation of ICD-9 chapters.

Source: Australian Institute of Health and Welfare

Table S29: Separations from public acute hospitals[(a)], by sex and age group, States and Territories[(b)], 1987–88 or latest year

(Number)

Age group (years)	*NSW 1986*	*Vic 1987–88*	*Qld 1986*	*WA 1987*	*SA 1987–88*	*ACT 1987–88*	*NT 1987–88*
Males							
Less than 1	21,059	12,130	7,326	5,705	4,323	592	2,349
1–4	23,702	16,391	14,019	9,365	9,161	928	1,701
5–9	14,763	11,462	8,091	5,968	5,500	565	729
10–14	14,276	9,044	7,722	4,630	4,026	511	480
15–19	16,891	11,476	10,167	5,755	5,364	792	645
20–24	19,217	12,129	11,530	6,627	5,976	874	967
25–29	17,887	12,036	10,335	6,394	5,638	829	1,013
30–34	16,904	11,017	8,835	6,638	5,379	822	976
35–39	17,864	10,793	8,886	5,995	5,057	1,069	891
40–44	16,621	10,739	9,057	5,604	4,827	1,026	756
45–49	16,650	11,118	8,704	5,304	4,595	1,022	643
50–54	19,251	12,602	10,868	5,981	5,299	961	530
55–59	25,961	15,941	12,541	6,444	6,753	1,229	514
60–64	29,799	18,582	13,269	7,539	9,493	1,563	439
65–69	28,096	17,634	11,599	7,684	9,575	1,247	326
70–74	26,419	17,929	11,674	7,473	8,932	905	223
75–79	20,803	14,669	8,690	6,376	7,081	643	137
80–84	11,703	9,267	5,683	3,913	4,160	308	73
85 and over	6,430	5,415	2,803	2,223	2,439	173	—
Unknown	—	—	—	—	365	2,437	38
All ages	**364,296**	**240,374**	**181,799**	**115,618**	**113,943**	**18,496**	**13,430**
Females							
Less than 1	15,861	8,850	5,470	4,167	3,055	346	1,887
1–4	15,470	9,995	9,713	6,281	6,010	567	1,260
5–9	10,690	7,644	5,812	4,136	3,748	433	473
10–14	11,226	6,871	5,470	3,894	3,055	460	479
15–19	24,986	16,750	15,020	10,147	7,449	1,165	1,610
20–24	49,663	31,387	26,334	15,708	13,153	2,416	2,369
25–29	63,284	42,527	26,776	18,638	16,513	3,503	2,504
30–34	46,664	33,974	18,486	14,025	12,273	2,924	1,804
35–39	30,807	21,595	12,355	9,612	7,926	1,818	1,169
40–44	21,352	15,918	9,324	7,025	5,901	1,556	693
45–49	20,002	12,807	8,059	6,009	5,343	901	535
50–54	19,237	12,019	9,322	5,391	5,525	1,135	457
55–59	22,890	13,349	9,475	5,621	5,723	1,459	325
60–64	24,805	15,892	10,306	6,820	7,990	966	262
65–69	26,314	15,987	12,241	7,168	8,567	1,056	232
70–74	26,011	16,659	10,019	6,826	7,538	830	175
75–79	22,621	16,149	8,174	7,016	7,256	664	123
80–84	16,057	12,702	6,559	4,981	5,360	363	63
85 and over	13,649	10,567	4,669	3,986	4,126	274	—
Unknown	—	—	—	—	632	2,315	52
All ages	**481,589**	**321,642**	**213,584**	**147,451**	**137,143**	**25,151**	**16,472**

Continued next page

Table S29: Separations from public acute hospitals[a], by sex and age group, States and Territories[b], 1987–88 or latest year (continued)

(Number)

Age group (years)	*NSW 1986*	*Vic 1987–88*	*Qld 1986*	*WA 1987*	*SA 1987–88*	*ACT 1987–88*	*NT 1987–88*
Persons							
Less than 1	36,920	20,980	12,796	9,872	7,378	938	4,236
1–4	39,172	26,386	23,732	15,646	15,171	1,495	2,961
5–9	25,453	19,106	13,903	10,104	9,248	998	1,202
10–14	25,502	15,915	13,192	8,524	7,081	971	959
15–19	41,877	28,226	25,187	15,902	12,813	1,957	2,255
20–24	68,880	43,516	37,864	22,335	19,129	3,290	3,336
25–29	81,171	54,563	37,111	25,032	22,151	4,332	3,517
30–34	63,570	44,991	27,321	20,663	17,652	3,746	2,780
35–39	48,671	32,388	21,241	15,607	12,983	2,887	2,060
40–44	37,973	26,657	18,381	12,629	10,728	2,582	1,449
45–49	36,652	23,925	16,763	11,313	9,938	1,923	1,178
50–54	38,488	24,621	20,190	11,372	10,824	2,096	987
55–59	48,851	29,290	22,016	12,065	12,476	2,688	839
60–64	54,604	34,474	23,575	14,359	17,483	2,529	701
65–69	54,410	33,621	23,840	14,852	18,142	2,303	558
70–74	52,430	34,588	21,693	14,299	16,470	1,735	398
75–79	43,424	30,818	16,864	13,392	14,337	1,307	260
80–84	27,760	21,969	12,242	8,894	9,520	671	136
85 and over	20,079	15,982	7,472	6,209	6,565	447	—
Unknown	—	—	—	—	997	4,752	90
All ages	845,887	562,016	395,383	263,069	251,086	43,647	29,902

(a) Does not include Department of Veterans' Affairs hospitals.

(b) No data available for Tasmania.

Source: Australian Institute of Health and Welfare

Table S30: Occupied bed-days in public acute hospitals[a], by sex and age group, States and Territories[b], 1987–88 or latest year

(Number)

Age group (years)	*NSW 1986*	*Vic 1987–88*	*Qld 1986*	*WA 1987*	*SA 1987–88*	*ACT 1987–88*	*NT 1987–88*
Males							
Less than 1	121,295	76,183	51,782	32,671	27,677	2,624	16,397
1–4	66,692	40,930	37,892	26,335	27,970	2,540	10,928
5–9	46,450	29,788	22,487	17,807	15,551	1,504	3,245
10–14	53,661	30,164	25,370	15,155	12,331	1,741	2,296
15–19	80,872	50,769	46,226	22,785	21,371	3,326	3,903
20–24	92,897	54,404	55,645	27,258	23,345	5,166	6,878
25–29	85,945	51,886	50,028	25,247	22,504	4,198	6,225
30–34	82,200	48,010	42,115	25,338	21,322	3,682	6,343
35–39	85,432	48,823	44,652	23,926	20,989	4,179	5,813
40–44	89,321	52,019	45,592	26,571	23,781	3,899	4,917
45–49	96,910	56,273	49,385	25,723	26,328	4,620	4,732
50–54	128,770	71,442	61,188	30,834	28,610	5,265	3,998
55–59	188,286	98,734	81,730	37,419	42,478	6,678	4,598
60–64	229,838	137,944	95,053	47,586	60,195	8,990	4,578
65–69	244,464	144,353	89,618	50,888	70,013	8,255	3,523
70–74	272,240	171,565	104,435	55,708	71,434	8,958	2,272
75–79	235,955	169,714	98,491	57,886	72,143	7,831	1,679
80–84	161,726	122,849	71,373	46,470	50,382	3,991	746
85 and over	99,027	86,149	42,741	28,019	36,039	2,319	—
Unknown	—	—	—	—	2,735	16,591	612
All ages	**2,463,981**	**1,541,999**	**1,115,803**	**623,626**	**677,198**	**106,357**	**93,683**
Females							
Less than 1	100,625	61,250	41,953	25,495	22,133	1,718	12,804
1–4	44,570	26,954	26,810	19,427	18,578	1,747	10,452
5–9	32,226	19,635	16,886	12,144	10,833	1,116	2,271
10–14	43,146	22,986	19,284	12,928	11,227	1,936	2,947
15–19	105,859	67,594	59,474	36,872	26,797	4,163	8,349
20–24	220,846	134,756	108,887	61,812	55,313	11,176	11,344
25–29	293,614	202,368	119,236	77,761	73,897	17,922	11,479
30–34	222,297	159,163	84,268	57,859	55,622	14,392	9,132
35–39	144,118	97,760	58,756	40,513	36,742	8,887	6,530
40–44	106,323	68,591	45,909	28,120	26,782	6,289	3,781
45–49	103,040	64,054	42,737	28,928	24,440	4,655	3,191
50–54	112,264	64,383	46,911	26,606	26,386	4,895	3,233
55–59	149,459	86,734	58,534	30,749	35,240	6,511	2,820
60–64	195,677	115,989	72,619	42,731	51,445	5,832	2,747
65–69	244,213	143,386	89,478	53,278	63,600	8,842	2,334
70–74	295,801	181,488	105,178	63,233	76,583	9,579	2,332
75–79	298,879	207,566	103,845	78,465	81,674	10,987	1,307
80–84	243,026	203,974	100,381	67,829	70,164	7,399	1,045
85 and over	242,129	204,579	81,518	62,002	69,229	6,282	—
Unknown	—	—	—	—	7,408	14,740	906
All ages	**3,198,112**	**2,133,210**	**1,282,664**	**826,752**	**844,093**	**149,068**	**99,004**

Continued next page

Table S30: Occupied bed-days in public acute hospitals(a), by sex and age group, States and Territories(b), 1987–88 or latest year (continued)

(Number)

Age group (years)	*NSW 1986*	*Vic 1987–88*	*Qld 1986*	*WA 1987*	*SA 1987–88*	*ACT 1987–88*	*NT 1987–88*
Persons							
Less than 1	221,920	137,433	93,735	58,166	49,810	4,342	29,201
1–4	111,262	67,884	64,702	45,762	46,548	4,287	21,380
5–9	78,676	49,423	39,373	29,951	26,384	2,620	5,516
10–14	96,807	53,150	44,654	28,083	23,558	3,677	5,243
15–19	186,731	118,363	105,700	59,657	48,168	7,489	12,252
20–24	313,743	189,160	164,532	89,070	78,658	16,342	18,222
25–29	379,559	254,254	169,264	103,008	96,401	22,120	17,704
30–34	304,499	207,173	126,383	83,197	76,944	18,074	15,475
35–39	229,550	146,583	103,408	64,439	57,731	13,066	12,343
40–44	195,644	120,610	91,501	54,691	50,563	10,188	8,698
45–49	199,950	120,327	92,122	54,651	50,768	9,275	7,923
50–54	241,034	135,825	108,099	57,440	54,996	10,160	7,231
55–59	337,745	185,468	140,264	68,168	77,718	13,189	7,418
60–64	425,515	253,933	167,672	90,317	111,640	14,822	7,325
65–69	488,677	287,739	179,096	104,166	133,613	17,097	5,857
70–74	570,041	353,053	209,613	118,941	148,017	18,537	4,604
75–79	534,834	377,280	202,336	136,351	153,817	18,818	2,986
80–84	404,752	326,823	171,754	114,299	120,546	11,390	1,791
85 and over	341,156	290,728	124,259	90,021	105,268	8,601	—
Unknown	—	—	—	—	10,143	31,331	1,518
All ages	**5,662,095**	**3,675,209**	**2,398,467**	**1,450,378**	**1,521,291**	**255,425**	**192,687**

(a) Does not include Department of Veterans' Affairs hospitals.

(b) No data available for Tasmania.

Source: Australian Institute of Health and Welfare

Table S31: Separations from public acute hospitals[(a)], by leading 40 procedures, States and Territories[(b)], 1987–88 or latest year

(Number)

ICD-9-CM procedure code[(c)]	*NSW 1986*	*Vic 1987–88*	*Qld 1986*	*WA 1987*	*SA 1987–88*	*ACT 1987–88*	*NT 1987–88*
135	2,918	3,190	1,375	1,805	1,056	125	72
200	2,954	3,305	1,027	1,037	1,612	125	104
231	3,284	3,515	398	1,040	1,252	393	129
282	2,054	1,932	1,046	832	777	108	57
332	3,410	2,339	1,570	1,016	1,213	168	19
372	4,237	1,845	412	1,176	562	348	—
385	2,185	1,944	1,134	744	667	131	44
399	35,433	14,712	15,244	10,705	14,834	3,488	23
441	21,876	11,992	5,131	1,950	2,150	501	106
451	2,447	4,760	910	5,242	4,499	1,308	2
452	9,482	5,339	3,699	2,456	2,263	708	34
470	8,246	5,144	3,167	2,223	1,611	382	212
512	6,333	4,422	2,562	1,556	1,788	255	102
530	5,983	3,812	2,634	1,450	1,267	204	141
542	3,062	3,402	1,210	1,115	1,504	173	80
573	7,153	4,495	2,717	1,516	2,329	144	93
602	4,165	3,056	1,257	777	1,130	127	23
640	2,826	1,891	606	734	809	275	179
663	4,829	1,150	1,791	334	363	35	126
673	2,446	2,649	1,373	889	517	305	198
684	4,201	3,152	1,818	1,284	1,010	222	130
690	28,928	16,208	8,746	7,572	4,839	1,056	900
695	2,261	4,985	6	322	3,349	117	616
721	4,265	1,550	435	348	793	274	37
722	3,990	2,561	1,189	794	510	326	73
730	1,332	8,204	2,636	223	1,163	767	97
736	10,889	6,338	5,454	1,119	1,703	1,049	521
741	11,576	7,321	5,043	2,653	2,679	874	412
756	7	6,952	1,542	1,058	1,263	680	280
786	2,523	2,105	1,771	840	1,072	127	146
790	8,772	4,782	2,920	1,754	2,143	168	312
793	5,011	3,778	3,065	2,138	1,452	216	312
852	2,811	2,301	1,328	947	474	231	93
860	3,340	1,614	2,097	1,172	755	79	419
862	4,794	3,343	2,080	1,640	1,470	168	196
863	14,302	7,500	4,899	2,590	2,039	952	197
865	3,045	1,801	1,862	835	1,244	41	193
885	1,366	2,248	647	1,406	2,177	116	—
990	3,239	3,421	1,231	2,049	2,178	40	5
992	1,466	6,422	1,681	5,072	4,699	1,138	111
Total	**253,441**	**181,480**	**99,713**	**74,413**	**79,215**	**17,944**	**6,794**

(a) Does not include Department of Veterans' Affairs hospitals.

(b) No data available for Tasmania.

(c) See Appendix 2 for an explanation of ICD-9-CM procedure codes.

Source: Australian Institute of Health and Welfare

Table S32: Occupied bed-days in public acute hospitals[a], by leading 40 procedures, States and Territories[b], 1987–88 or latest year

(Number)

ICD-9-CM procedure code[c]	*NSW 1986*	*Vic 1987–88*	*Qld 1986*	*WA 1987*	*SA 1987–88*	*ACT 1987–88*	*NT 1987–88*
135	16,499	10,132	6,087	5,407	3,987	1,141	554
200	4,189	4,557	1,430	1,419	2,328	165	165
231	4,985	4,471	1,003	1,573	2,778	712	189
282	6,421	5,882	2,499	2,499	2,727	174	129
332	21,955	15,167	15,022	7,269	8,620	983	289
372	17,187	9,032	2,124	5,892	1,645	1,821	—
385	12,908	8,980	4,794	3,601	3,588	1,014	149
399	38,838	18,710	16,513	11,765	18,266	3,863	115
441	84,707	44,411	23,336	4,611	5,264	1,705	450
451	10,049	15,319	3,148	15,898	14,512	3,882	2
452	33,808	17,054	10,218	6,119	9,380	1,969	233
470	43,710	24,170	14,955	10,071	8,837	1,904	1,120
512	72,567	41,505	24,435	15,420	18,614	2,767	1,020
530	33,931	16,703	11,602	6,698	7,330	908	886
542	7,178	7,918	3,142	2,689	3,636	405	155
573	23,377	12,157	12,550	4,324	8,770	573	445
602	44,374	28,495	13,862	8,442	9,630	2,080	262
640	5,135	2,796	1,405	1,625	1,464	1,368	635
663	10,300	2,850	4,406	1,270	926	122	677
673	2,964	3,393	2,304	1,174	705	309	253
684	39,390	30,120	15,044	11,788	10,069	2,007	1,268
690	45,822	25,056	17,373	11,811	9,292	1,517	1,778
695	2,545	5,729	21	452	3,819	158	671
721	28,495	11,525	2,975	2,690	5,173	1,851	223
722	28,109	18,849	7,780	5,746	3,486	2,399	499
730	7,487	53,163	15,292	1,290	6,647	4,366	578
736	61,730	38,523	28,398	6,185	9,256	5,965	3,068
741	112,303	73,609	43,953	25,101	27,381	8,153	4,837
756	7	39,278	7,999	5,425	6,566	3,600	1,634
786	13,303	8,529	7,256	3,545	4,449	406	506
790	36,086	20,719	11,098	6,450	7,860	876	1,301
793	92,695	64,830	49,957	30,759	13,466	2,724	4,152
852	8,931	5,640	5,244	2,541	1,635	494	305
860	18,507	6,981	11,412	5,852	3,672	371	3,275
862	43,450	20,853	14,993	14,938	11,546	774	2,345
863	49,299	20,658	20,365	7,345	7,427	1,902	817
865	12,068	6,700	6,889	2,655	4,694	325	883
885	5,293	7,473	2,937	3,888	8,059	495	—
990	20,355	14,910	6,717	13,647	10,203	314	24
992	4,505	16,154	5,538	13,213	13,140	2,939	220
Total	**1,125,462**	**783,001**	**456,076**	**293,087**	**300,847**	**69,501**	**36,112**

(a) Does not include Department of Veterans' Affairs hospitals.

(b) No data available for Tasmania.

(c) See Appendix 2 for an explanation of ICD-9-CM procedure codes.

Source: Australian Institute of Health and Welfare

Table S33: Separations from public acute hospitals[(a)], by leading 40 principal diagnoses, States and Territories[(b)], 1987–88 or latest year

(Number)

ICD-9-CM diagnoses[(c)]	*NSW 1986*	*Vic 1987–88*	*Qld 1986*	*WA 1987*	*SA 1987–88*	*ACT 1987–88*	*NT 1987–88*
162	4,471	3,639	1,816	787	1,190	194	62
173	4,357	3,014	1,533	1,025	876	480	70
250	5,129	4,034	2,249	1,192	1,519	231	128
345	4,626	2,589	2,596	1,537	1,174	133	166
366	4,616	4,701	2,819	2,347	1,524	155	105
410	10,759	6,609	4,369	2,496	2,938	334	116
413	8,119	2,826	3,814	2,303	1,420	209	87
414	11,693	5,236	3,120	1,332	4,137	310	37
427	5,809	3,364	2,197	1,374	1,445	212	61
428	8,625	5,795	3,873	2,515	2,658	270	144
436	5,712	3,502	2,184	1,178	1,582	96	53
474	3,899	3,592	1,981	1,722	1,644	213	173
493	15,807	11,463	9,515	7,165	6,318	618	472
496	6,397	3,505	2,349	1,489	1,822	84	190
530	6,942	4,365	2,572	1,661	2,435	632	54
540	5,452	3,917	1,562	977	988	281	158
550	6,590	4,617	3,024	1,672	1,591	314	150
558	8,790	3,441	2,659	2,781	2,061	268	31
574	7,276	5,068	2,792	1,740	1,969	338	134
599	5,794	3,144	2,848	1,761	1,671	136	271
626	8,890	5,634	3,646	2,271	2,055	323	300
634	6,979	4,118	2,880	1,538	1,193	364	338
635	3,514	4,509	49	68	3,231	109	645
642	5,144	4,593	2,650	1,856	1,535	335	248
644	6,834	4,706	3,358	1,891	1,604	411	248
650	22,813	9,534	19,068	5,722	4,997	1,099	1,055
656	8,364	6,409	1,367	1,444	2,402	436	210
664	12,319	6,778	1,519	1,049	1,888	693	267
682	4,223	2,562	2,870	1,407	1,116	113	563
724	6,128	3,639	4,173	3,916	3,124	198	192
780	9,848	4,560	5,145	3,724	3,307	293	330
786	10,008	5,527	5,147	3,459	4,049	342	234
788	4,796	2,023	3,044	1,524	1,542	53	113
789	15,509	8,979	11,502	6,323	5,416	454	490
813	7,086	3,745	2,680	1,689	1,894	113	332
820	4,910	2,906	1,627	1,081	1,114	111	67
854	5,588	2,064	6,275	963	935	52	200
V25	9,387	6,758	2,353	3,307	2,700	336	283
V56	35,199	17,421	23,417	10,591	14,375	3,443	5
V58	5,794	4,296	3,603	3,692	3,983	1,155	78
Total	**334,196**	**199,182**	**166,245**	**96,569**	**103,422**	**15,941**	**8,860**

(a) Does not include Department of Veterans' Affairs hospitals.

(b) No data available for Tasmania.

(c) See Appendix 2 for an explanation of ICD-9-CM diagnoses.

Source: Australian Institute of Health and Welfare

Table S34: Occupied bed-days in public acute hospitals(a), by leading 40 principal diagnoses, States and Territories(b), 1987–88 or latest year

(Number)

ICD-9-CM diagnoses(c)	*NSW 1986*	*Vic 1987–88*	*Qld 1986*	*WA 1987*	*SA 1987–88*	*ACT 1987–88*	*NT 1987–88*
162	53,222	32,884	22,308	8,118	13,007	2,245	788
173	24,072	12,466	8,227	5,496	4,119	792	378
250	55,155	41,789	22,742	12,529	16,400	2,158	1,135
345	23,216	13,555	12,767	6,580	5,316	604	764
366	24,439	15,591	11,980	7,059	5,943	563	771
410	115,759	58,932	39,554	22,193	30,804	3,781	1,104
413	50,473	13,309	18,527	10,277	7,035	1,202	457
414	93,796	37,605	26,862	7,411	26,847	1,243	286
427	34,118	18,286	12,264	7,009	8,207	1,162	224
428	113,638	68,560	43,936	25,491	28,916	3,561	1,745
436	146,679	88,197	48,988	32,376	40,374	2,317	890
474	10,637	9,451	3,838	4,448	4,679	310	365
493	60,206	36,745	32,121	22,699	24,157	2,624	1,618
496	73,649	41,500	25,166	15,890	20,271	1,685	1,825
530	23,622	14,359	9,542	4,495	8,230	1,356	206
540	29,577	18,995	7,411	4,346	5,329	1,502	769
550	35,793	19,818	12,275	7,480	8,392	1,229	650
558	28,863	11,608	10,408	9,460	8,374	752	186
574	66,346	40,566	20,296	14,371	16,234	3,088	1,121
599	30,429	17,199	18,436	8,758	8,463	645	1,601
626	23,681	12,185	11,744	9,519	6,610	864	659
634	10,461	6,327	5,113	2,314	2,241	497	746
635	4,432	5,329	136	145	3,707	147	696
642	41,683	31,773	14,368	12,614	10,287	2,771	1,967
644	22,823	16,614	8,134	5,508	6,035	1,670	939
650	117,030	52,129	91,169	29,749	30,668	5,632	5,227
656	52,209	42,529	8,052	9,625	15,794	3,107	1,436
664	64,762	38,595	7,904	5,190	9,490	3,625	1,427
682	32,071	18,434	18,050	8,800	7,248	557	4,182
724	43,424	25,482	28,165	16,730	21,183	1,408	927
780	34,528	16,985	18,732	11,731	15,678	1,065	1,194
786	35,868	16,245	18,386	12,393	14,795	1,088	939
788	16,153	8,220	12,196	5,293	7,279	251	498
789	43,047	23,479	32,315	17,806	18,053	1,110	1,636
813	21,818	10,825	8,258	4,870	5,367	394	1,435
820	119,072	70,363	38,520	24,107	13,708	3,696	1,279
854	15,980	6,962	16,050	2,841	3,338	206	716
V25	13,631	9,759	4,797	5,111	5,571	392	435
V56	35,686	26,935	24,587	10,649	15,160	3,457	5
V58	14,000	8,608	7,980	9,745	9,356	1,634	176
Total	**1,856,048**	**1,059,193**	**782,304**	**441,226**	**512,665**	**66,390**	**43,402**

(a) Does not include Department of Veterans' Affairs hospitals.

(b) No data available for Tasmania.

(c) See Appendix 2 for an explanation of ICD-9-CM diagnoses.

Source: Australian Institute of Health and Welfare

Other health conditions

Table S35: Leading cancers(a), new cases and deaths by type and sex, 1985

	New cases				*Deaths*		
Cancer	*Number*	*Per cent*	*Rate*(b)	*Lifetime risk*(c)	*Number*	*Per cent*	*Rate*(b)
Males							
Lung	4,923	17.7	52.6	1 in 15	4,396	28.6	46.7
Prostate	4,079	14.7	41.6	1 in 23	1,556	10.1	15.9
Colon	2,695	9.7	28.9	1 in 30	1,437	9.4	15.4
Melanoma	1,946	7.0	21.8	1 in 43	403	2.6	4.5
Bladder	1,770	6.4	18.6	1 in 48	497	3.2	5.2
Rectum	1,542	5.5	16.7	1 in 51	604	3.9	6.4
Stomach	1,222	4.4	13.1	1 in 69	884	5.8	9.5
NHL(d)	1,005	3.6	11.0	1 in 81	461	3.0	5.0
Pancreas	662	2.4	7.0	1 in 124	646	4.2	6.9
Kidney	554	2.0	6.1	1 in 140	346	2.3	3.8
All cancers	**27,801**	**100.0**	**300.1**	**1 in 3**	**15,352**	**100.0**	**164.6**
Females							
Breast	5,791	24.1	58.7	1 in 16	2,195	18.6	21.0
Colon	2,727	11.4	23.6	1 in 38	1,515	12.8	12.4
Melanoma	2,021	8.4	21.5	1 in 47	269	2.3	2.6
Rectum	1,192	5.0	16.7	1 in 51	442	3.7	3.5
Lung	1,457	6.1	13.7	1 in 58	1,251	10.6	11.4
Cervix	1,037	4.3	11.1	1 in 88	363	3.1	3.5
Uterus	1,020	4.2	10.0	1 in 83	282	2.4	2.3
Ovary	920	3.8	9.2	1 in 97	575	4.9	5.4
NHL(d)	832	3.5	7.8	1 in 109	448	3.8	3.8
Stomach	664	2.7	5.0	1 in 196	492	4.2	3.7
All cancers	**24,019**	**100.0**	**228.7**	**1 in 4**	**11,809**	**100.0**	**103.3**
Persons							
Lung	6,380	12.3	31.2	1 in 25	5,647	20.8	27.2
Breast	5,852	11.3	30.8	1 in 30	2,206	8.1	11.1
Colon	5,422	10.5	25.9	1 in 34	2,952	10.9	13.7
Melanoma	3,967	7.7	21.4	1 in 45	672	2.5	3.5
Prostate	4,079	7.9	17.2	1 in 50	1,556	5.7	6.2
Rectum	2,734	5.3	13.4	1 in 63	1,046	3.9	4.8
Bladder	2,347	4.5	10.9	1 in 79	690	2.5	2.9
NHL(d)	1,837	3.5	9.3	1 in 94	909	3.3	4.3
Stomach	1,866	3.6	8.6	1 in 105	1,376	5.1	6.3
Pancreas	1,250	2.4	5.7	1 in 149	1,218	4.5	5.6
All cancers	**51,820**	**100.0**	**256.7**	**1 in 4**	**27,161**	**100.0**	**129.1**

(a) Rankings are based on the number of new cases; excludes non-melanocytic skin cancers.

(b) Age-standardised rates are expressed per 100,000 population using the World Standard Population.

(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 to 74.

(d) Non-Hodgkin's lymphoma.

Source: Australian Institute of Health and Welfare and National Cancer Statistics Clearing House (in press)

Table S36: Notifiable diseases[a], 1981 to 1990

(Number)

Disease	*1981*	*1986*	*1987*	*1988*	*1989*	*1990*
AIDS	—	228	371	522	568	591
Amoebiasis[b]	62	54	58	60	64	8
Ankylostomiasis[b]	136	40	57	35	106	2
Anthrax[b]	—	—	1	—	—	—
Arbovirus infection[b]	17	1,414	1,085	897	2,809	2,008
Brucellosis[b]	36	12	12	16	20	46
Campylobacter infections[b]	338	2,922	2,923	4,082	4,279	5,683
Chancroid[b]	20	12	4	4	3	13
Cholera	2	—	—	2	—	1
Cogenital rubella syndrome	—	2	3	2	—	2
Diphtheria[b]	18	44	32	61	1	7
Donovanosis[b]	67	185	148	133	99	91
Giardiasis[b]	661	1,316	1,508	1,753	2,060	817
Genital herpes	362	2,136	2,359	2,129	2,581	2,470
Gonococcal opthalmia neonatorum[b]	3	5	5	3	1	—
Gonorrhoea[b]	11,197	6,585	4,979	4,079	3,153	1,919
Hepatitis A (infectious)	1,453	1,685	715	600	460	530
Hepatitis B (serum)[b]	500	1,766	1,605	1,683	3,017	2,970
Hepatitis—unspecified	108	136	131	69	43	707
Hydatid disease[b]	24	14	17	15	15	16
Lassa fever	—	—	—	—	—	—
Legionnaires disease[b]	17	68	96	67	104	90
Leprosy	38	27	31	20	34	31
Leptospirosis[b]	95	179	133	104	99	121
Lymphogranuloma venereum[b]	2	4	—	—	—	—
Malaria[b]	408	696	574	601	770	882
Marburg disease	—	—	—	—	—	—
Measles	(c)	(c)	(c)	248	169	880
Meningococcal infections[b]	64	51	96	126	204	295
Non-specific urethritis	1,298	8,063	7,384	3,210	1,739	1,553
Ornithosis[b]	13	43	13	21	25	23

Continued next page

Table S36: Notifiable diseases[a], 1981 to 1990 (continued)

(Number)

Disease	*1981*	*1986*	*1987*	*1988*	*1989*	*1990*
Pertussis (whooping cough)	170	601	291	153	614	862
Plague	—	—	—	—	—	—
Poliomyelitis[b]	—	1	—	—	—	—
Q fever[b]	433	367	355	424	353	431
Rabies	—	—	—	—	—	—
Salmonella infections[b]	2,269	2,494	2,739	3,484	4,492	4,564
Shigella infections	424	833	586	581	779	610
Smallpox	—	—	—	—	—	—
Syphilis[b]	2,916	3,594	3,190	3,056	2,099	1,643
Tetanus	12	5	5	5	11	6
Trachoma	1	233	274	268	504	5
Tuberculosis (all forms)[b]	1,460	1,041	686	1,165	1,351	684
Typhoid fever[b]	26	45	47	40	57	70
Typhus (all forms)[b]	—	11	9	8	2	4
Vibrio parahaemolyticus infections[b]	(c)	6	6	2	10	23
Yellow fever	—	—	—	—	—	—
Yersinia infections[b]	(c)	78	122	172	241	433

(a) Cases notified for diseases as recommended by the National Health and Medical Research Council, 86th session, October 1978.

(b) Confirmed by appropriate diagnostic tests.

(c) Not notifiable.

Sources: Commonwealth Department of Health 1984
Department of Health, Housing and Community Services 1991

Table S37: Virus and selected non-virus reports(a), 1981 to 1990

(Number)

	1981	*1986*	*1987*	*1988*	*1989*	*1990*
Virus						
Adenovirus	759	1,283	1,298	1,352	1,641	1,427
Arbovirus group A—						
Ross River	478	907	926	679	2,077	669
Sindbis	2	—	—	—	1	—
Barmah Forest(b)	—	—	—	—	42	10
Unspecified	5	—	3	5	24	—
Arbovirus group B—						
Australian encephalitis	13	3	2	1	1	2
Dengue	98	10	14	11	39	69
Kunjin	—	4	6	—	4	1
Unspecified	15	13	22	16	28	20
Coxsackievirus	266	85	314	344	150	189
Cytomegalovirus	938	1,216	1,484	1,424	1,614	1,809
Echovirus	550	515	318	522	515	204
Epstein-Barr virus	206	698	802	781	1,052	1,211
Hepatitis A	694	1,049	483	380	221	262
Hepatitis B	1,657	3,116	3,021	2,466	3,061	2,980
Hepatitis C(b)	—	—	—	—	—	114
Hepatitis D(b)	—	—	—	—	—	1
Hepatitis, other non-A, non-B	—	—	—	—	2	5
Herpes virus group (untyped)	185	584	119	120	366	210
Herpes simplex	5,209	11,252	11,835	11,303	10,361	8,953
Herpes Type 6(b)	—	—	—	—	1	1
HTLV-1(b)	—	—	—	—	—	3
Influenza	452	158	709	1,331	1,017	300
Measles	364	76	136	45	70	221
Molluscum contagiosum	25	8	3	1	4	6
Mumps	384	67	72	49	60	54
Parainfluenza	691	842	735	1,056	970	835
Poliovirus	271	242	232	176	239	247
Respiratory syncytial virus	1,252	1,831	2,104	1,931	3,066	3,133
Rhinovirus	440	679	553	773	759	470
Rotavirus	1,246	1,704	1,545	1,638	1,693	1,874
Rubella	464	567	394	196	582	300
Vaccinia	2	—	1	—	—	—
Varicella zoster	205	251	319	346	436	450
Other viruses(c)	202	1,238	819	706	634	927

Continued next page

Table S37: Virus and selected non-virus reports[a], 1981 to 1990 (continued)

(Number)

	1981	*1986*	*1987*	*1988*	*1989*	*1990*
Non-virus						
Chlamydia						
LGV	2	67	125	7	2	21
Psittaci	79	108	62	90	92	86
Trachomatis	1,443	3,790	3,792	2,815	3,374	3,155
Coxiella burneti	562	303	351	272	227	248
Other rickettsiae	—	2	3	2	4	2
Mycoplasma pneumoniae	378	434	993	1,240	703	402
Total	**19,537**	**33,103**	**33,595**	**32,078**	**35,132**	**30,871**

(a) As reported by virus laboratories through Communicable Diseases Intelligence network.

(b) New codes introduced in 1990.

(c) Includes: astrovirus, calicivirus, coronavirus, cowpox virus, enterovirus types 69, 70 and 71, milker's nodule virus, norwalk agent, orf virus, papovavirus, paramyxovirus, picornavirus not typed, poxvirus not typed, reovirus and small round virus.

Sources: Commonwealth Department of Health 1984
Department of Health, Housing and Community Services 1991

Table S38: AIDS cases, by sex and exposure category, 1982 to 1991

(Number)

Sex / Exposure category	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*	*1988*	*1989*	*1990*	*1991*
Males										
Homosexual / bisexual	1	4	33	101	198	327	468	507	544	544
Homosexual / bisexual and intravenous drug use	—	2	1	1	11	8	16	15	10	19
Heterosexual	—	—	—	—	—	1	4	4	16	23
Heterosexual and intravenous drug use	—	—	—	—	1	1	6	8	6	14
Hemophilia / coagulation disorder	—	—	2	1	2	6	7	10	12	6
Receipt of blood transfusion, blood components or tissue	—	—	9	7	6	11	5	7	6	8
Mother with / at risk for HIV infection	—	—	—	—	—	—	—	1	2	1
Other / undetermined	—	—	—	3	2	7	6	15	20	17
All males	**1**	**6**	**45**	**113**	**220**	**361**	**512**	**567**	**616**	**632**
Females										
Heterosexual contact	—	—	—	1	—	5	5	4	3	4
Heterosexual and intravenous drug use	—	—	—	—	1	1	5	5	5	8
Hemophilia / coagulation disorder	—	—	—	—	—	—	—	—	—	—
Receipt of blood transfusion, blood components or tissue	—	—	1	10	6	9	2	3	5	3
Mother with / at risk for HIV infection	—	—	—	1	—	—	1	—	1	1
Other / undetermined	—	—	—	—	—	—	2	2	1	3
All females	**—**	**—**	**1**	**12**	**7**	**15**	**15**	**14**	**15**	**19**

Source: National Centre in HIV Epidemiology and Clinical Research (unpublished)

Table S39: Dental caries experience[a] of 6-year-old and 12-year-old school children, States and Territories, 1986 to 1989

(Mean number of teeth)

	NSW	*Vic*	*Qld*	*WA*	*SA*	*Tas*	*ACT*	*NT*	*Australia*
6-year-olds (dmft)									
1986	1.94	1.86	2.44	1.71	2.10	1.75	1.48	2.12	1.98
1987	1.88	1.86	2.42	1.69	2.87	1.83	1.42	1.94	1.94
1988	1.83	1.89	2.40	1.52	2.02	1.66	1.29	1.81	1.93
1989[b]	2.21	2.16	2.34	1.62	2.21	1.70	1.17	2.04	2.16
12-year-olds (DMFT)									
1986	1.53	2.42	2.10	2.38	2.26	1.68	1.74	1.69	2.01
1987	1.29	2.13	1.93	2.17	1.94	1.47	1.44	1.24	1.77
1988	1.24	1.93	1.85	1.96	1.69	1.29	1.20	1.34	1.62
1989[b]	1.32	1.54	1.65	2.04	1.47	1.06	1.14	1.08	1.50

(a) As measured by dmft / DMFT index—see Box 2.5, p 57. Beginning in 1989, the dmft index (number of decayed, missing and filled deciduous teeth) was recorded in all States and Territories other than Queensland. In Queensland during 1989 the dft (number of decayed and filled deciduous teeth) was recorded. Prior to 1989 the dft index was recorded in all States and Territories. The increase in caries experience in 1989 may therefore be associated with the adoption of the more comprehensive dmft index.

(b) Preliminary data.

Source: AIHW Dental Statistics and Research Unit

Table S40: Deciduous teeth with caries experience (dmft)[a], 4- to 10-year-old children, 1977 and 1986 to 1989

(Mean number of teeth)

	Age (years)						
	Four	*Five*	*Six*	*Seven*	*Eight*	*Nine*	*Ten*
1977	2.86	2.96	3.13	3.35	3.37	3.01	2.23
1986	1.73	1.77	1.98	2.30	2.42	2.43	2.01
1987	1.69	1.73	1.94	2.13	2.31	2.29	1.91
1988	1.68	1.73	1.93	2.12	2.20	2.23	1.86
1989[b]	(c)	2.01	2.16	2.36	2.29	2.25	1.93

(a) Beginning in 1989, the dmft index (number of decayed, missing and filled deciduous teeth) was recorded in all States and Territories other than Queensland. In Queensland during 1989 the dft (number of decayed and filled deciduous teeth) was recorded. Prior to 1989 the dft index was recorded in all States and Territories. The increase in caries experience in 1989 may therefore be associated with the adoption of the more comprehensive dmft index.

(b) Preliminary data.

(c) Insufficient numbers examined to provide an estimate.

Source: AIHW Dental Statistics and Research Unit

Table S41: Permanent teeth with caries experience (DMFT), 6- to 12-year-old children, 1977 and 1986 to 1989

(Mean number of teeth)

	Age (years)						
	Six	*Seven*	*Eight*	*Nine*	*Ten*	*Eleven*	*Twelve*
1977	0.51	1.21	1.94	2.50	3.10	3.92	4.80
1986	0.09	0.34	0.60	0.81	1.18	1.54	2.01
1987	0.09	0.28	0.57	0.78	1.01	1.36	1.76
1988	0.08	0.28	0.49	0.70	0.99	1.26	1.62
1989[(a)]	0.09	0.25	0.46	0.64	0.85	1.38	1.50

(a) Preliminary data.

Source: AIHW Dental Statistics and Research Unit

Health expenditure

Table S42: Total health expenditure (current and constant 1990–91 prices) and rate of growth 1982–83 to 1990–91

	Total health expenditure ($m)		
Year	*Current prices*	*Constant 1990–91 prices*[(a)]	*Annual growth rate (per cent)*[(a)]
1982–83	13,241	22,401	
1983–84	14,957	23,818	6.3
1984–85	16,541	24,749	3.9
1985–86	18,575	26,100	5.5
1986–87	21,091	27,126	3.9
1987–88	23,276	28,047	3.4
1988–89	26,145	29,408	4.9
1989–90[(b)]	28,381	30,023	2.1
1990–91[(b)]	30,923	30,923	3.0

(a) Health expenditure 1982–83 to 1990–91 deflated to constant 1990–91 prices using specific health deflators.

(b) Based on preliminary ABS estimates.

Source: Australian Institute of Health and Welfare

Table S43: Total health expenditure and GDP (current prices), 1982–83 to 1990–91

Year	*Total health expenditure ($m)*	*GDP ($m)*	*Per cent of GDP*
1982–83	13,241	171,626	7.7
1983–84	14,957	194,617	7.7
1984–85	16,541	216,059	7.7
1985–86	18,575	240,091	7.7
1986–87	21,091	264,627	8.0
1987–88	23,276	299,429	7.8
1988–89	26,145	339,834	7.7
1989–90(a)	28,381	371,930	7.6
1990–91(a)	30,923	379,580	8.1

(a) Total health expenditure figures are based on preliminary ABS estimates.

Sources: Australian Bureau of Statistics 5206.0
Australian Institute of Health and Welfare

Table S44: Recurrent health expenditure(a) (current and constant 1990–91 prices) and rate of growth 1982–83 to 1990–91

	Recurrent health expenditure ($m)		
Year	*Current prices*	*Constant 1990–91 prices*(b)	*Annual growth rate (per cent)*(b)
1982–83	12,777	21,660	
1983–84	14,354	22,913	5.8
1984–85	15,772	23,646	3.2
1985–86	17,577	24,792	4.8
1986–87	19,958	25,738	3.8
1987–88	21,993	26,556	3.2
1988–89	24,780	27,913	5.1
1989–90(c)	26,896	28,500	2.1
1990–91(c)	29,442	29,442	3.3

(a) Government capital consumption included in recurrent expenditure.

(b) Health expenditure 1982–83 to 1990–91 deflated to constant 1990–91 prices using specific health deflators.

(c) Based on preliminary ABS estimates.

Source: Australian Institute of Health and Welfare

Table S45: Health expenditure per person (current and constant 1990–91 prices) and rate of growth, 1982–83 to 1990–91

	Expenditure per person ($)		
Year	*Current prices*	*Constant 1990–91 prices*(a)	*Annual growth rate (%)*(a)
1982–83	866	1,465	
1983–84	966	1,538	5.0
1984–85	1,055	1,578	2.6
1985–86	1,168	1,641	4.0
1986–87	1,307	1,681	2.4
1987–88	1,419	1,710	1.7
1988–89	1,566	1,761	3.0
1989–90(b)	1,674	1,770	0.5
1990–91(b)	1,796	1,796	1.5

(a) Health expenditure 1982–83 to 1990–91 deflated to constant 1990–91 prices using specific health deflators.

(b) Based on preliminary ABS estimates.

Source: Australian Institute of Health and Welfare

Table S46: Total health expenditure (current prices), 1978–79, 1983–84 and 1988–89

		($ million)	
Health expenditure	*1978–79*	*1983–84*	*1988–89*
Recurrent health expenditure			
Institutional			
Hospitals			
Recognised public	2,664	4,651	7,758
Repatriation	126	227	392
Private	362	803	1,334
Public psychiatric	363	564	884
Total hospitals	3,514	6,245	10,367
Nursing homes	568	1,257	2,086
Other	116	258	411
Total institutional	4,198	7,760	12,864
Non-insitutional			
Medical services	1,277	2,416	4,359
Dental services	355	622	1,255
Other professional services	173	433	852
Community health, health promotion and illness prevention	211	487	995
Pharmaceuticals	693	1,221	2,170
Other non-institutional(a)	553	1,057	1,797
Total non-institutional	3,263	6,236	11,429
Total recurrent health expenditure(b)	7,462	13,996	24,293
Capital health expenditure	579	604	1,365
Capital consumption	200	358	487
Total health expenditure	8,240	14,957	26,145

(a) Include aids and appliances, research, administration and other non-institutional services.

(b) Does not include capital consumption.

Source: Australian Institute of Health and Welfare

Table S47: Total health expenditure (constant 1990–91 prices), 1978–79, 1983–84 and 1988–89

($ million)

Health expenditure	*1978–79*	*1983–84*	*1988–89*
Recurrent health expenditure			
Institutional			
Hospitals			
Recognised public	6,652	7,142	8,604
Repatriation	314	349	435
Private	904	1,233	1,479
Public psychiatric	906	866	980
Total hospitals	8,776	9,590	11,498
Nursing homes	1,417	1,930	2,313
Other	291	396	456
Total institutional	10,484	11,916	14,267
Non-insitutional			
Medical services	3,749	4,429	5,173
Dental services	1,078	1,191	1,485
Other professional services	424	662	945
Community health, health promotion and illness prevention	505	734	1,101
Pharmaceuticals	1,558	1,874	2,418
Other non-institutional(a)	1,315	1,590	1,991
Total non-institutional	8,629	10,480	13,114
Total recurrent health expenditure(b)	**19,113**	**22,396**	**27,381**
Capital health expenditure	**1,481**	**905**	**1,495**
Capital consumption	**496**	**518**	**532**
Total health expenditure	**21,090**	**23,818**	**29,408**

(a) Include aids and appliances, research, administration and other non-institutional services.

(b) Does not include capital consumption.

Source: Australian Institute of Health and Welfare

Table S48: Total health expenditure (constant 1990–91 prices[(a)]), by source of funds, 1970–71 to 1990–91

($ million)

	Public sector				
Year	*Commonwealth Government*	*State and local government*	*Total government*	*Private sector*	*All sectors*
1970–71	3,462	3,647	7,109	5,557	12,666
1971–72	3,882	3,846	7,729	5,687	13,416
1972–73	4,104	4,065	8,169	5,946	14,115
1973–74	4,285	4,549	8,835	5,849	14,684
1974–75	4,841	5,402	10,243	6,218	16,461
1975–76	9,111	4,699	13,810	5,297	19,107
1976–77	8,053	4,770	12,823	6,652	19,474
1977–78	7,338	5,061	12,399	7,966	20,365
1978–79	7,460	5,517	12,977	8,113	21,090
1979–80	7,344	5,466	12,810	8,289	21,098
1980–81	7,566	5,615	13,181	8,129	21,309
1981–82	7,689	5,847	13,536	8,549	22,085
1982–83	7,601	5,782	13,383	9,018	22,401
1983–84	9,158	6,034	15,192	8,627	23,818
1984–85	11,534	6,130	17,664	7,085	24,749
1985–86	12,101	6,502	18,603	7,497	26,100
1986–87	12,191	6,887	19,078	8,047	27,126
1987–88	12,464	7,101	19,565	8,481	28,047
1988–89	12,543	7,723	20,266	9,142	29,408
1989–90[(b)]	12,990	8,009	21,000	9,034	30,034
1990–91[(b)]	13,294	8,128	21,422	9,501	30,923

(a) Health expenditure is converted to real values using deflators with a 1984–85 base year, but then expressed in 1990–91 prices by inflating with the 1990–91 health price deflator.

(b) The Commonwealth, State and local government, and private sector break-ups of health expenditure for 1989–90 and 1990–91 are preliminary estimates obtained as follows:

- For Commonwealth expenditure, the 1988–89 Institute estimate of Commonwealth health outlays (current prices) was multiplied by the growth rate for 1988–89 to 1989–90 shown in *Budget Paper No. 1*, 1991–92, p. 3–296 to obtain 1989–90 Commonwealth Government health outlays (current prices). This figure was then reflated by the Commonwwealth health deflator to arrive at 1989–90 Commonwealth Government health outlays in 1990–91 prices. The same technique was applied to obtain the 1990–91 figure.
- For State and local government expenditure, growth rates of State and local final consumption expenditure and gross fixed capital expenditure from *Australian national accounts: national income and expenditure June quarter 1991* (ABS 5206.0) were applied to the 1988–89 Institute estimate of State and local government health outlays (current prices) to obtain 1989–90 and 1990–91 State and local government health outlays in current prices. The 1989–90 figure was then reflated by the State and local government health outlay deflator to arrive at 1989–90 State and local government health outlays in 1990–91 prices. The same technique was applied to obtain the 1990–91 figure.
- The private sector expenditure was calculated as a residual.

Source: Australian Institute of Health and Welfare

Table S49: Total health expenditure by area of expenditure and source of funds(a), 1988–89

($ million)

	Public sector			*Private sector*					
Area of expenditure	*Common-wealth*	*State/ local*	*Total*	*Health insurance funds*	*Indiv-iduals*	(b) *Other*	*Total*	*Total*	*Per cent*
Total health expenditure	**11,062**	**6,976**	**18,038**	**2,774**	**3,906**	**753**	**8,107**	**26,145**	
Capital expenditure	**92**	**599**	**691**	(c)	(c)	(c)	**674**	**1,365**	
Capital consumption	**44**	**443**	**487**	(d)	(d)	(d)	(d)	**487**	
Total recurrent expenditure	**10,926**	**5,934**	**16,860**	**2,774**	**3,906**	**753**	**7,433**	**24,293**	**100.0**
Total institutional	*5,202*	*4,908*	*10,110*	*1,595*	*736*	*423*	*2,754*	*12,864*	*53.0*
Total hospitals	3,717	4,477	8,194	1,542	224	408	2,173	10,367	42.7
Recognised public	3,280	3,662	6,942	484	—	332	816	7,758	31.9
Private	52	—	52	1,046	161	75	1,281	1,334	5.5
Repatriation	374	6	381	11	—	—	11	392	1.6
Public psychiatric	10	809	819	—	63	1	64	884	3.6
Total nursing homes(e)	1,390	254	1,644	—	437	5	442	2,086	8.6
Other institutional services	95	177	272	54	75	11	139	411	1.7
Ambulance	36	177	214	54	75	11	139	353	1.5
Other institutional (nec)	59	—	59	—	—	—	—	59	0.2
Total non-institutional	*5,724*	*1,026*	*6,750*	*1,179*	*3,171*	*330*	*4,679*	*11,429*	*47.0*
Medical services	3,516	—	3,516	136	516	192	844	4,359	17.9
Dental services	27	76	103	418	731	3	1,152	1,255	5.2
Other professional services	93	—	93	126	549	84	760	852	3.5
Community health services	202	494	696	1	—	19	20	716	2.9

Continued next page

Table S49 **Total health expenditure by area of expenditure and source of funds[a], 1988–89** (continued)

($ million)

	Public sector			Private sector					
Area of expenditure	*Common-wealth*	*State/ local*	*Total*	*Health insurance funds*	*Indiv-iduals*	*(b) Other*	*Total*	*Total*	*Per cent*
Total non–institutional (continued)									
Total pharmaceuticals	1,106	—	1,106	30	1,025	9	1,064	2,170	8.9
Benefits paid items	1,106	—	1,106	—	168	—	168	1,275	5.2
All other items	—	—	—	30	857	9	896	896	3.7
Aids and appliances	46	2	48	120	304	24	448	495	2.0
Health promotion & illness prevention	67	213	280	—	—	—	—	280	1.2
Administration	408	99	507	348	—	—	348	855	3.5
Research	248	44	292	—	45	—	45	337	1.4
Other non–institutional	12	99	110	—	—	—	—	110	0.5

(a) This table records the amounts provided by the Commonwealth, State and local governments and the private sector. It does not give the actual amount spent directly on health goods and services by each sector.

(b) The 'Other' column includes the health costs paid by workers compensation and motor vehicle third party insurance funds.

(c) Capital expenditure for the private sector cannot be broken down by source of funds.

(d) Capital consumption (depreciation) for the private sector is included in recurrent expenditure.

(e) 1988–89 and 1987–88 nursing home expenditure is not comparable with earlier years because from 1987–88 non-aged nursing home expenditure was not included and the methodology for calculating individual contributions changed.

Source: Australian Institute of Health and Welfare

Table S50: Medicare levy, States and Territories, 1985–86 to 1990–91

($ million)

	Taxation statistics[a]									Budget paper statistics
Year	*NSW*	*Vic*	*Qld*	*WA*	*SA*	*Tas*	*ACT*	*NT*	*Aust*	*Australia*
1985–86	390	319	158	105	95	30	33	10	1,139	1,335
1986–87	502	433	208	142	122	38	43	13	1,500	1,715
1987–88	623	544	258	177	150	45	53	14	1,865	2,080
1988–89	714	613	305	205	169	50	59	15	2,130	2,320
1989–90	755	640	322	214	177	52	62	18	2,242	2,545
1990–91	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	2,480

(a) The taxation statistics are recorded by the State office that processes the tax return which is not necessarily the State where the taxpayers reside. The figures published in the Taxation Statistics are lower than the figures published in the Budget Statements, because the Taxation Statistics exclude the provisional debit component of the Medicare levy paid by provisional income earners. Further information on these differences is available from the Revenue Analysis Branch of the Australian Taxation Office.

(b) Not available.

Sources: *Budget Statements: Budget paper No. 1*, 1985–86 to 1990–91
Australian Taxation Office 1987, 1988, 1989, 1990

Table S51: Total health expenditure as a percentage of GDP, Australia and selected OECD countries, 1970 to 1990

(Per cent)

Year	(a)*Aust*	*Can*	*Fra*	*FRG*	*Jpn*	*NZ*	*Swe*	*UK*	*USA*	*Nine-country mean*(b)	*Eight-country mean*(c)
1970	5.4	7.1	5.8	5.9	4.4	5.2	7.2	4.5	7.4	5.9	5.7
1971	5.7	7.4	6.0	6.3	4.5	(d)	7.5	4.6	7.5	5.5	5.3
1972	5.9	7.2	6.1	6.5	4.6	(d)	7.5	4.7	7.7	5.6	5.3
1973	5.8	7.0	6.2	6.8	4.5	5.5	7.4	4.6	7.6	6.2	6.0
1974	5.9	6.8	6.3	7.4	5.0	6.2	7.6	5.3	8.0	6.5	6.3
1975	6.5	7.2	7.0	8.1	5.5	6.7	7.9	5.5	8.4	7.0	6.8
1976	7.5	7.2	7.0	8.1	5.5	6.3	8.2	5.5	8.6	7.1	6.9
1977	7.5	7.2	7.0	8.1	5.7	6.7	9.1	5.3	8.8	7.3	7.1
1978	7.8	7.2	7.3	8.1	5.9	7.1	9.2	5.3	8.7	7.4	7.2
1979	7.6	7.1	7.4	8.1	6.0	7.0	9.0	5.3	8.8	7.4	7.2
1980	7.4	7.4	7.6	8.4	6.4	7.2	9.4	5.6	9.3	7.6	7.4
1981	7.3	7.5	7.9	8.7	6.6	6.9	9.5	5.9	9.7	7.8	7.5
1982	7.5	8.4	8.0	8.6	6.8	7.2	9.7	5.8	10.5	8.0	7.7
1983	7.7	8.6	8.2	8.5	6.8	6.6	9.6	6.0	10.7	8.1	7.7
1984	7.7	8.5	8.5	8.7	6.6	6.1	9.4	5.9	10.5	8.0	7.7
1985	7.7	8.5	8.5	8.7	6.5	6.5	8.8	5.8	10.7	8.0	7.6
1986	7.7	8.8	8.5	8.7	6.6	6.8	8.5	5.9	10.9	8.0	7.7
1987	8.0	8.8	8.5	8.7	6.7	7.3	8.6	5.8	11.1	8.2	7.8
1988	7.8	8.7	8.6	8.9	6.6	7.3	8.5	5.8	11.4	8.2	7.8
1989	7.7	8.7	8.8	8.2	6.5	7.3	8.7	5.9	11.7	8.2	7.7
1990	7.6	9.0	8.9	8.1	6.3	7.2	8.7	6.1	12.4	8.2	7.7
Average	**7.1**	**7.8**	**7.5**	**8.0**	**5.9**	**6.1**	**8.6**	**5.5**	**9.5**	**7.3**	**7.1**

(a) Due to differences between OECD and Australian labelling conventions, caution needs to be exercised in comparing data presented here with those published by OECD. This table follows the Australian convention of labelling data for a financial year by the second year (that is, 1974–75 data are labelled 1975), whereas OECD would label the data by the first year (that is, 1974–75 data would be labelled 1974).

(b) Unweighted means.

(c) Unweighted means. Excludes USA.

(d) Not available.

Source: OECD 1991
Australian Institute of Health and Welfare

Table S52: Proportion of population with basic private hospital insurance, States[a], 1983 to 1991

(Per cent)

Date	*NSW*	*Vic*	*Qld*	*WA*	*SA*	*Tas*	*Aust*
31 December 1983	63.9	70.2	38.9	60.5	67.6	65.5	62.7
31 December 1984	47.0	52.8	35.5	52.0	54.2	51.4	47.9
31 December 1985	50.1	53.8	35.6	50.9	53.4	50.6	49.1
31 December 1986	51.5	55.0	34.7	47.2	51.3	50.7	49.2
31 December 1987	50.5	52.2	33.2	45.3	49.3	49.9	47.4
31 December 1988	49.4	50.3	32.6	43.3	48.3	49.1	46.1
31 December 1989	47.0	50.0	32.1	41.3	44.3	48.7	44.5
31 December 1990	47.0	51.1	31.7	40.1	43.1	47.5	44.4
31 December 1991	45.2	44.4	32.8	40.3	39.9	44.5	41.9

(a) NSW data includes ACT, SA data includes NT.

Source: Private Health Insurance Administration Council (unpublished)

Health labourforce

Table S53: Employment in the health industry, 1981 to 1991

Year	*Employed in health industry*	*All employed persons*	*Proportion of all employed persons*	*Civilian labour force*(a)	*Proportion of civilian labour force* (a)
	('000)	*('000)*	*(Per cent)*	*('000)*	*(Per cent)*
1981	406.1	6,393.7	6.4	6,774.3	6.0
1982	424.5	6,379.3	6.7	6,840.7	6.2
1983	440.6	6,241.1	7.1	6,927.9	6.4
1984	453.6	6,466.1	7.0	7,070.1	6.4
1985	461.6	6,675.6	6.9	7,248.3	6.4
1986	489.2	6,918.6	7.1	7,516.2	6.5
1987	510.5	7,092.3	7.2	7,694.4	6.6
1988	530.7	7,353.4	7.2	7,892.1	6.7
1989	520.3	7,727.6	6.7	8,197.0	6.3
1990	557.9	7,825.0	7.1	8,412.5	6.6
1991	580.0	7,669.2	7.6	8,475.2	6.8

(a) Includes unemployed persons looking for work.

Source: Australian Bureau of Statistics (unpublished)

Use of professional services

Table S54: Medical and optometrical services, fee and benefits under Medicare, 1984–85 to 1989–90

Year	*Number of services*	*Fees charged*	*Schedule fees*	*Benefits*
	(million)	*($ million)*	*($ million)*	*($ million)*
Medical services excluding pathology				
1984–85	90.4	2,137.8	2,201.1	1,915.9
1985–86	96.6	2,434.7	2,493.4	2,175.0
1986–87	99.1	2,716.1	2,769.0	2,397.5
1987–88	104.6	3,063.6	3,070.4	2,572.1
1988–89	109.4	3,390.3	3,380.9	2,826.5
1989–90	116.4	3,836.3	3,810.8	3,189.2
Pathology				
1984–85	22.3	382.1	410.8	350.9
1985–86	24.3	453.4	489.7	418.1
1986–87	27.2	485.8	498.7	425.1
1987–88	29.6	554.7	570.0	477.8
1988–89	32.0	606.8	610.1	511.3
1989–90(a)	34.4	641.3	656.0	549.6
All medical services				
1984–85	112.7	2,519.9	2,611.9	2,266.8
1985–86	120.9	2,888.1	2,983.1	2,593.1
1986–87	126.3	3,201.9	3,267.7	2,822.6
1987–88	134.2	3,618.3	3,640.4	3,049.9
1988–89	141.4	3,997.1	3,991.0	3,337.8
1989–90	150.8	4,477.6	4,466.8	3,738.8
Optometry				
1984–85	1.5	49.2	53.8	46.6
1985–86	1.7	57.3	63.1	54.6
1986–87	1.9	65.2	72.3	62.1
1987–88	2.1	69.7	78.4	66.7
1988–89	2.2	76.6	86.3	73.4
1989–90	2.4	86.7	98.5	83.8
All services				
1984–85	114.2	2,569.1	2,665.7	2,313.4
1985–86	122.6	2,945.4	3,046.2	2,647.7
1986–87	128.2	3,267.1	3,340.0	2,884.7
1987–88	136.3	3,688.0	3,718.8	3,116.6
1988–89	143.6	4,073.7	4,077.3	3,411.2
1989–90	153.2	4,564.3	4,565.3	3,822.6

(a) Pathology service use was estimated on a pre-1989 schedule structure.

Source: Deeble 1991

Health technology

Table S55: Usage of selected health technologies, 1986–87 to 1990–91

	1986–87	*1987–88*	*1988–89*	*1989–90*	*1990–91*
Services					
Ultrasound ('000)	802.0	895.5	1,026.1	1,176.2	1,348.3
CT scanning ('000)	277.1	298.7	328.2	358.5	406.6
Radiology ('000)	5,195.6	5,358.3	5,565.9	5,982.8	6,432.3
MRI (Number)	2,745	5,637	8,438	10,705	12,373
Pathology ('000)	27,134.0	29,543.7	31,825.9	24,342.9	25,779.2
Nuclear medicine ('000)	102.1	124.3	238.5	151.3	137.8
Radiotherapy ('000)	294.0	324.4	258.6	274.8	287.0
Endoscopy ('000)	488.3	526.9	584.6	646.8	699.8
Services as a percentage of total medical services[a]			(Per cent)		
Ultrasound	0.63	0.66	0.72	0.83	0.92
CT scanning	0.22	0.22	0.23	0.25	0.28
Radiology	4.06	3.94	3.88	4.21	4.41
Pathology	21.23	21.73	22.30	17.14	17.67
Nuclear medicine	0.08	0.09	0.17	0.11	0.09
Radiotherapy	0.23	0.24	0.18	0.19	0.20
Endoscopy	0.38	0.39	0.41	0.46	0.48
			(Number)		
Lasers in: Ophthalmology	27,122	29,785	33,768	39,567	44,533
Gynecology	—	—	8,076	12,633	11,038
Dermatology	—	—	6,743	7,821	7,964
Ocular lens extraction	28,986	29,614	31,300	33,018	35,574
Artificial lens insertion, removal, repositioning	29,365	30,612	32,211	33,928	36,322
Shockwave lithotripsy	664	1,180	1,409	1,481	2,036
Cardiac pacemakers	816	948	954	1,133	1,214

(a) Recorded on a date-rendered basis.

Source: Health Insurance Commission (unpublished)

Table S56: Heart operations, 1986 to 1990

Operation	*1986*	*1987*	*1988*	*1989*	*1990*
Coronary angioplasty	1,840	2,383	3,153	4,219	4,904
By-pass surgery	8,048	9,236	9,566	10,531	(a)
Heart transplants[b]	35	29	48	90	98

(a) Not available.

(b) Includes heart / lung transplants.

Sources: National Heart Foundation of Australia 1991a, 1991b
Australian Institute of Health and Welfare

Table S57: Kidney transplants, Australia and New Zealand, 1985 to 1990

	1985	*1986*	*1987*	*1988*	*1989*	*1990*
Australia						
Kidney transplant operations						
Number	415	437	391	466	491	442
Per million population	26	27	24	28	29	26
Functioning transplants						
Number	2,186	2,422	2,609	2,836	3,099	3,315
Per million population	139	152	161	172	184	194
New Zealand						
Kidney transplant operations						
Number	88	105	79	78	83	101
Per million population	27	32	24	23	25	30
Functioning transplants						
Number	377	426	452	484	532	579
Per million population	115	129	136	145	158	171

Source: Disney 1991

Table S58: Renal dialysis, Australia and New Zealand, 1985 to 1990

Patients on dialysis	*1985*	*1986*	*1987*	*1988*	*1989*	*1990*
Australia						
Number	2,244	2,350	2,546	2,691	2,759	2,949
Per million population	142	147	157	163	164	173
Percentage on CAPD[(a)]	26	28	30	31	30	30
New Zealand						
Number	403	401	437	482	529	550
Per million population	123	121	132	144	157	162
Percentage on CAPD[(a)]	42	41	41	44	46	50

(a) Continuous Ambulatory Peritoneal Dialysis.

Source: Disney 1991

Table S59: Liver transplants, 1985 to 1990

Transplants	*1985*	*1986*	*1987*	*1988*	*1989*	*1990*	*Total*
Number	7	26	30	63	100	80	306

Source: Combined Liver Transplant Registries 1991

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Appendix 1

Figure tables

Table A1: Major cancers, age-standardised death rates by sex(a), 1921 to 1990

(Deaths per 100,000 population)

	Males				*Females*			
Year	*Lung*	*Colorectal*	*Prostate*	*Stomach*	*Lung*	*Colorectal*	*Breast*	*Stomach*
1921	(b)	19.6	8.0	43.3	(b)	21.7	20.8	29.4
1941	11.5	29.4	18.4	41.7	3.7	29.3	28.9	26.0
1961	38.4	25.6	24.5	27.9	4.7	25.0	25.7	15.5
1981	67.8	30.6	26.0	15.6	12.3	22.8	24.9	6.7
1986	62.9	30.9	27.5	13.2	15.7	22.8	26.2	5.6
1987	62.5	30.9	28.2	12.3	14.7	21.8	25.9	5.3
1988	63.5	30.7	29.2	12.6	17.1	20.8	26.2	5.4
1989	62.3	30.0	30.2	11.0	17.1	19.8	26.4	5.2
1990	58.4	29.3	30.4	10.7	16.8	19.9	26.1	4.8

(a) Standardised to the 1988 Australian population.

(b) Data for lung cancer not available before 1931.

Source: Australian Institute of Health and Welfare

Table A2: Neonatal and postneonatal mortality rates and ratio of neonatal to post-neonatal rates, 1921–1925 to 1986–1990

(Per 1,000 livebirths)

Period	*Neonatal*	*Postneonatal*	*Rate ratio (Neonatal / Postneonatal)*
1921–1925	29.9	28.0	1.1
1926–1930	29.0	23.0	1.3
1931–1935	27.2	14.0	1.9
1936–1940	26.2	12.6	2.1
1941–1945	23.9	11.1	2.2
1946–1950	19.3	7.6	2.5
1951–1955	16.5	6.9	2.4
1956–1960	15.1	6.0	2.5
1961–1965	14.0	5.4	2.6
1966–1970	13.1	5.0	2.6
1971–1975	11.6	4.7	2.5
1976–1980	8.3	3.8	2.2
1981–1985	6.2	3.6	1.7
1986–1990	5.1	3.4	1.5
1986	5.4	3.4	1.6
1987	5.1	3.6	1.4
1988	5.3	3.4	1.6
1989	4.7	3.3	1.4
1990	4.9	3.3	1.5

Source: Based on data provided by the State and Territory Registrars of Births, Deaths and Marriages

Table A3: Infant mortality rates by sex, 1921 to 1990

(Per 1,000 livebirths)

Period	*Males*	*Females*	*Persons*	*Ratio of male to female death rate*
1921–1925	64.2	51.2	57.9	1.25
1926–1930	57.7	46.0	52.0	1.25
1931–1935	46.0	36.3	41.3	1.27
1936–1940	43.2	34.2	38.8	1.26
1941–1945	38.8	30.9	35.0	1.26
1946–1950	30.1	23.7	27.0	1.27
1951–1955	26.0	20.6	23.3	1.26
1956–1960	23.3	18.7	21.1	1.25
1961–1965	21.7	17.0	19.4	1.28
1966–1970	20.4	15.7	18.1	1.30
1971–1975	18.3	14.1	16.2	1.30
1976–1980	13.5	10.7	12.1	1.26
1981–1985	11.0	8.6	9.8	1.28
1986–1990	9.5	7.4	8.5	1.28
1986	10.0	7.7	8.8	1.30
1987	9.9	7.4	8.7	1.33
1988	9.7	7.5	8.7	1.29
1989	8.8	7.1	8.0	1.25
1990	9.1	7.2	8.2	1.25

Source: Based on data provided by the State and Territory Registrars of Births, Deaths and Marriages

Table A4: Fetal, neonatal and perinatal mortality rates[a], 1973 to 1990

(Deaths per 1,000 births)

Year	*Fetal*	*Neonatal*	*Perinatal*
1973	10.5	11.3	21.7
1974	10.5	11.2	21.6
1975	9.3	9.5	18.7
1976	9.3	9.5	18.7
1977	8.3	8.3	16.5
1978	8.4	7.8	16.1
1979	7.8	7.2	15.0
1980	7.5	6.7	14.1
1981	7.2	6.1	13.3
1982	7.1	6.4	13.4
1983	6.6	5.6	12.2
1984	6.6	5.1	11.7
1985	6.2	5.8	12.0
1986	6.5	5.0	11.5
1987	5.8	4.8	10.6
1988	6.0	4.7	10.7
1989	5.8	4.2	10.0
1990	6.0	4.3	10.3

(a) For the fetal and perinatal rates, the denominator is total births (fetal deaths plus live births); for the neonatal rate it is live births.

Source: AIHW National Perinatal Statistics Unit, derived from ABS 3304.0

Table A5: Neonatal mortality rate by age at death, 1973 to 1990

(Deaths per 1,000 livebirths)

	Age at death			
Year	*Less than 1 day*	*1 to 6 days*	*7 to 27 days*	*All ages*
1973	6.4	3.6	1.2	11.3
1974	5.9	4.0	1.3	11.2
1975	5.5	2.9	1.1	9.5
1976	5.3	2.9	1.3	9.5
1977	4.7	2.3	1.3	8.3
1978	4.6	2.1	1.1	7.8
1979	4.0	2.1	1.2	7.2
1980	3.6	1.9	1.2	6.7
1981	3.4	1.6	1.1	6.1
1982	3.5	1.8	1.2	6.4
1983	3.2	1.4	1.0	5.6
1984	2.7	1.4	0.9	5.1
1985	2.9	1.7	1.2	5.8
1986	2.6	1.4	1.0	5.0
1987	2.4	1.4	1.0	4.8
1988	2.4	1.4	0.9	4.7
1989	2.0	1.3	0.9	4.2
1990	2.2	1.2	0.9	4.3

Source: AIHW National Perinatal Statistics Unit, derived from ABS 3304.0

Table A6: Proportionate perinatal mortality rates(a), selected birthweights(b), 1973 to 1990

(Deaths per 1,000 births)

	Birthweight		
Year	*Less than 1,000 g*	*1,000 to 2,499 g*	*2,500 g and over*
1973	4.8	8.5	6.5
1974	5.0	8.8	6.5
1975	4.7	7.4	5.7
1976	4.9	7.2	5.8
1977	4.3	6.2	5.4
1978	4.4	6.1	5.0
1979	4.2	5.3	4.8
1980	4.2	5.1	4.3
1981	4.1	4.6	4.1
1982	4.2	4.5	4.3
1983	3.8	4.0	3.8
1984	3.7	4.0	3.5
1985	3.9	4.1	3.5
1986	3.9	3.6	3.4
1987	3.4	3.4	3.3
1988	3.3	3.5	3.3
1989	3.2	3.1	3.1
1990	3.4	3.4	3.1

(a) In the absence of national birthweight-specific rates for the whole period, these rates show deaths by birthweight per 1,000 births of all weights.

(b) Excludes perinatal deaths for which birthweight was not known.

Source: AIHW National Perinatal Statistics Unit, derived from ABS 3304.0

Table A7: Hospitalisation, admission rates and average length of stay, by age group and sex, New South Wales and South Australia, 1988(a)

	Admission rate (per 1,000 population)			*Average length of stay (days)*		
Age group (years)	*Male*	*Female*	*Persons*	*Male*	*Female*	*Persons*
0 to 4	260.8	190.8	226.6	3.8	4.2	4.0
5 to 14	93.9	74.8	84.6	2.7	2.9	2.8
15 to 24	109.8	215.1	161.3	3.9	3.6	3.5
25 to 34	119.3	328.1	222.8	3.9	4.1	3.6
35 to 44	134.5	216.1	174.7	4.1	4.1	4.1
45 to 54	198.8	229.0	213.6	4.8	4.7	4.7
55 to 64	306.6	266.6	286.6	6.0	5.7	5.9
65 to 74	471.0	351.2	405.9	7.5	8.2	7.8
75 and over	649.0	498.0	552.7	10.9	12.9	12.1
All ages(b)	**197.4**	**237.9**	**216.0**	**5.8**	**5.4**	**5.6**

(a) Standardised to the 1988 Australian population.

(b) Standardised rates.

Source: Australian Institute of Health and Welfare

Table A8: Hospitalisation, age-specific admission rates by selected ICD-9 chapter and sex, New South Wales and South Australia, 1988[(a)]

(Per 1,000 population)

	Age group (years)								
ICD–9 chapter	*Less than 5*	*5 to 14*	*15 to 24*	*25 to 34*	*35 to 44*	*45 to 54*	*55 to 64*	*65 to 74*	*75 and over*
Males									
Neoplasms	3.0	2.8	2.5	3.6	6.4	15.4	34.1	63.4	88.2
Circulatory	0.6	0.5	1.4	3.7	10.2	27.3	56.5	92.6	133.6
Respiratory	62.4	20.7	7.6	6.4	6.1	8.9	16.8	31.4	57.4
Digestive	25.8	9.5	15.9	16.1	19.6	28.6	41.2	54.8	70.9
Genitourinary	8.8	4.0	3.4	4.4	6.4	11.4	21.7	37.1	48.1
Musculoskeletal	1.7	2.9	9.7	13.2	16.1	18.8	21.8	24.5	26.9
Injury and poisoning	18.1	20.2	36.5	26.3	18.2	17.1	17.4	20.5	36.0
Supplementary	18.2	5.1	8.5	18.0	20.6	31.1	43.2	63.9	46.3
Females									
Neoplasms	3.3	2.8	4.5	8.2	15.4	23.4	27.1	36.0	39.3
Circulatory	0.5	0.3	1.2	3.8	7.5	16.1	30.2	56.7	103.6
Respiratory	40.3	18.0	11.4	8.0	7.2	9.1	12.3	18.8	29.6
Digestive	18.6	9.1	25.6	18.7	19.4	26.2	33.1	41.4	54.6
Genitourinary	3.7	2.4	22.6	45.8	46.7	44.7	24.5	23.2	18.9
Complications of pregnancy	—	0.2	85.9	162.6	32.1	0.4	—	—	—
Musculoskeletal	1.2	2.7	7.4	8.8	13.5	18.4	21.2	28.6	31.9
Injury and poisoning	14.5	12.0	14.2	11.4	11.3	12.1	13.8	22.5	54.4
Supplementary	9.8	2.6	9.5	27.8	26.9	34.0	54.6	49.7	37.2

(a) Standardised to the 1988 Australian population.

Source: Australian Institute of Health and Welfare

Table A9: Persons reporting recent illnesses and long-term health conditions, age-specific rates, 1989–1990

(Per 1,000 population)

	Age group (years)									
Condition	*Less than 5*	*5 to 14*	*15 to 24*	*25 to 34*	*35 to 44*	*45 to 54*	*55 to 64*	*65 to 74*	*75 and over*	*All ages[(a)]*
Neither recent nor long-term	286.2	307.5	213.4	175.9	141.2	67.3	30.0	22.2	16.6	162.7
Recent only	455.4	271.1	232.0	186.5	144.3	70.7	31.4	28.9	25.1	176.3
Long-term only	55.0	111.7	132.6	140.9	157.7	176.8	145.5	89.8	74.9	129.4
Both recent and long-term	203.4	309.7	421.9	496.7	556.8	685.2	793.1	859.1	883.4	531.6
Recent and / or long-term	713.8	692.5	786.6	824.1	858.8	932.7	970.0	977.8	983.4	837.3
Total recent	**658.8**	**580.8**	**653.9**	**683.2**	**701.1**	**755.9**	**824.5**	**888.0**	**908.6**	**707.9**
Total long-term	**258.4**	**421.4**	**554.5**	**637.6**	**714.5**	**862.1**	**938.6**	**949.0**	**958.3**	**661.0**

(a) Crude rate.

Source: Australian Bureau of Statistics 4370.0

Table A10: Reported recent illnesses, proportions by age group and sex, 1989–1990

(Per 1,000 population)

	Age group (years)									
Condition	*Less than 5*	*5 to 14*	*15 to 24*	*25 to 34*	*35 to 44*	*45 to 54*	*55 to 64*	*65 to 74*	*75 and over*	*All ages*[(a)]
Males										
Headache (unspecified cause)	4.6	59.4	112.5	132.0	139.9	103.4	110.6	59.2	49.6	97.3
Common cold	226.7	121.7	100.0	91.4	72.4	66.7	69.1	64.1	58.3	97.2
Hypertension	—	—	1.4	8.4	37.1	110.1	211.8	304.5	242.4	64.6
Injury	76.5	90.5	115.1	91.4	62.8	59.1	50.5	59.0	55.0	79.5
Eczema, dermatitis	150.0	37.0	38.7	37.2	44.1	36.1	41.2	47.0	40.8	47.9
Dental problems	106.5	59.6	36.0	40.8	47.5	45.6	50.4	44.8	26.7	50.0
Arthritis	—	0.6	0.4	7.5	15.9	34.1	102.8	171.9	194.3	33.5
Asthma	49.4	101.4	48.2	28.1	28.0	29.9	30.4	38.2	29.0	45.1
Females										
Headache (unspecified cause)	4.9	77.8	195.1	190.4	198.5	183.7	140.7	107.7	91.3	146.8
Common cold	227.3	133.3	105.4	84.9	69.0	58.7	57.5	55.7	54.7	94.0
Hypertension	—	—	1.4	9.9	35.9	134.0	273.7	382.9	393.7	93.8
Injury	63.5	89.8	68.7	52.9	54.8	56.3	49.3	57.4	66.8	62.8
Eczema, dermatitis	156.3	49.8	66.6	69.8	57.4	47.8	43.1	42.8	37.8	62.6
Dental problems	98.4	63.8	52.5	60.4	53.2	52.5	49.0	42.8	21.4	56.1
Arthritis	—	1.4	1.8	7.5	25.0	81.3	166.9	237.6	289.5	61.0
Asthma	31.2	63.1	50.3	36.8	28.3	36.1	37.5	46.9	24.3	41.2

(a) Crude rate.

Source: Australian Institute of Health and Welfare, derived from ABS 1989–90 National Health Survey

Table A11: Reported long-term health conditions, proportions by age group and sex, 1989–1990

(Per 1,000 population)

	Age group (years)									
Condition	*Less than 5*	*5 to 14*	*15 to 24*	*25 to 34*	*35 to 44*	*45 to 54*	*55 to 64*	*65 to 74*	*75 and over*	*Crude rate*
Males										
Arthritis	0.5	1.5	15.2	38.6	71.4	110.9	227.7	313.9	349.5	82.7
Asthma	105.1	178.0	93.3	59.1	51.7	45.0	45.1	56.9	45.0	81.7
Atherosclerosis	—	—	—	0.3	0.7	1.6	8.0	7.6	9.9	1.8
Back (unspecified)	0.4	2.4	60.5	114.1	152.3	150.8	131.7	95.6	60.7	88.4
Blindness	0.6	1.9	3.9	4.2	7.4	12.7	15.0	21.9	27.9	7.7
Bronchitis, emphysema	18.8	20.9	19.8	18.8	19.3	21.1	56.8	89.5	81.3	29.4
Cancer	1.8	1.3	1.4	5.0	11.4	20.7	41.2	74.2	75.1	16.0
Deafness	4.4	8.4	12.4	22.8	44.8	71.5	123.9	176.8	225.1	51.0
Diabetes	1.7	0.9	1.5	2.7	6.7	20.1	32.4	50.1	50.4	11.7
Eczema, dermatitis	52.5	32.6	21.0	31.4	31.0	21.9	16.1	31.3	40.2	29.3
Epilepsy	1.8	4.8	6.4	5.1	6.0	3.3	4.1	3.7	3.4	4.8
Eyesight disorders[(a)]	3.0	59.2	101.3	175.1	260.0	579.5	713.9	700.3	642.1	284.1
Gout	—	—	0.6	6.1	18.1	35.7	53.0	65.6	51.3	18.1
Hay fever	13.7	63.3	118.5	126.8	99.7	95.2	73.9	73.8	56.9	89.7
Heart disease	2.0	3.4	1.7	1.9	7.2	19.0	64.2	99.8	128.9	20.3
High blood sugar	—	—	0.6	0.6	1.7	1.3	0.5	1.5	1.7	0.8
Hypertension	—	—	3.3	15.1	47.7	102.8	194.4	249.8	211.7	60.9
Ill-defined heart	6.0	7.0	3.7	2.8	7.6	8.4	13.7	28.2	67.4	9.7
Migraine	—	14.2	23.0	24.9	31.8	30.4	18.8	13.3	11.5	21.1
Stroke[(b)]	—	0.3	0.3	0.4	2.2	2.0	12.2	33.8	36.7	5.1
Females										
Arthritis	0.4	3.2	17.7	39.1	83.9	213.5	342.6	427.2	457.8	129.5
Asthma	79.2	124.7	107.7	72.8	56.3	65.7	57.1	65.2	32.3	79.0
Atherosclerosis	—	0.1	—	—	—	1.8	3.8	9.2	8.8	1.7
Back (unspecified)	—	4.6	69.0	96.2	118.9	112.1	105.8	64.8	48.1	73.0
Blindness	0.6	2.2	4.2	4.5	3.0	6.6	10.3	18.4	34.9	7.0
Bronchitis, emphysema	13.1	13.8	27.2	29.2	24.3	30.6	51.2	51.2	49.2	29.5
Cancer	1.3	1.9	2.0	7.4	17.7	30.7	31.4	46.0	46.8	16.3
Deafness	3.0	10.8	11.9	14.5	21.4	35.4	51.0	74.8	135.0	29.8
Diabetes	—	0.8	2.0	3.1	7.4	13.6	24.6	44.8	41.4	11.1
Eczema, dermatitis	60.9	42.8	57.1	66.5	43.1	29.3	26.8	21.9	15.0	44.5
Epilepsy	0.1	3.4	6.2	7.2	5.6	5.8	1.7	4.1	2.1	4.7
Eyesight disorders[(a)]	5.5	67.6	213.4	227.3	312.0	662.6	753.2	702.5	630.3	345.8
Gout	—	—	0.4	1.0	1.4	5.4	8.4	17.6	18.8	4.0
Hay fever	12.0	60.0	141.5	146.6	134.9	119.3	105.5	69.0	60.0	105.5
Heart disease	1.3	1.6	2.8	3.4	4.9	11.1	32.4	69.8	112.9	17.0
High blood sugar	—	—	1.0	1.8	2.0	2.2	2.7	2.6	0.8	1.5
Hypertension	—	0.1	7.8	13.5	38.1	125.3	230.9	319.3	300.6	81.6
Ill-defined heart	10.1	5.6	6.7	14.1	7.2	11.5	16.6	24.9	50.9	13.0
Migraine	—	16.6	54.6	68.2	78.3	67.0	42.9	27.5	8.8	46.9
Stroke[(b)]	—	0.3	0.8	1.3	1.2	3.1	6.3	17.5	31.6	4.4

(a) Eyesight disorders of refraction or accomodation.

(b) Includes cerebrovascular disease and stroke after-effects.

Source: Australian Institute of Health and Welfare, derived from ABS 1989–90 National Health Survey

Table A12: Malignant neoplasms (excluding non-melanocytic skin cancers), age-specific incidence and death rates by sex, 1985

(Per 100,000 population)

	Incidence		*Mortality*	
Age group (years)	*Males*	*Females*	*Males*	*Females*
0–4	20	15	6	6
5–9	11	9	6	5
10–14	12	10	5	2
15–19	21	15	8	5
20–24	31	31	10	5
25–29	47	55	10	9
30–34	68	100	13	22
35–39	84	164	29	34
40–44	136	239	46	59
45–49	235	376	109	113
50–54	403	458	228	189
55–59	698	620	386	284
60–64	1,158	787	662	396
65–69	1,643	984	944	612
70–74	2,280	1,193	1,315	874
75–79	2,932	1,427	1,840	1,272
80–84	3,487	1,615	2,402	2,094
85 and over	3,971	1,835	3,098	4,157

Source: National Cancer Statistics Clearing House (unpublished)

Table A13: Leading cancers (excluding non-melanocytic skin cancers), age-specific incidence and death rates(a) by sex, 1985

(Per 100,000 population)

Males			*Females*		
Cancer type	*Incidence*	*Mortality*	*Cancer type*	*Incidence*	*Mortality*
Lung	53	48	Breast	59	21
Prostate	42	16	Colon	24	13
Colon	29	16	Melanoma	22	3
Melanoma	22	5	Lung	14	11
Bladder	19	5	Cervix	11	4
Rectum	17	6	Rectum	11	4
Stomach	13	10	Uterus	10	2
NHL(a)	11	5	Ovary	9	5
Pancreas	7	7	NHL(b)	8	4
Brain	7	5	Stomach	5	4

(a) Age standardised to the World Standard Population.

(b) Non-Hodgkins' lymphoma.

Source: National Cancer Statistics Clearing House (unpublished)

Table A14: Dental caries experience, by age group, 1987–1988

(Mean number of teeth)

Age group (years)	Decayed	Filled	Missing
5–14	0.38	0.79	0.02
15–24	1.38	4.07	0.41
25–34	1.80	9.08	2.91
35–44	1.41	10.60	6.79
45–54	1.35	9.17	9.88
55–64	1.26	7.51	13.68
65 and over	1.41	5.93	16.94

Source: AIHW Dental Statistics and Research Unit, derived from DCSH 1987–1988 National Oral Health Survey

Table A14a: Dental caries experience(a) of 12-year-old school children, 1977 to 1989

(Mean DMFT)

Year	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Number	4.79	4.51	3.94	3.56	3.22	3.01	2.62	2.35	2.13	2.01	1.77	1.62	1.50

(a) Mean decayed, missing and filled teeth.

Source: AIHW Dental Statistics and Research Unit, derived from DCSH 1987–1988 National Oral Health Survey

Table A15: Handicap severity, age-specific proportions by sex, 1988

(Per cent)

	Age group (years)							
Handicap severity	0 to 4	5 to 14	15 to 29	30 to 44	45 to 59	60 to 74	75 and over	All ages(a)
Males								
Severe	—	2.6	1.2	1.9	3.6	8.1	20.3	3.2
Moderate	—	1.1	1.1	2.5	5.6	12.8	14.0	3.6
Mild	—	1.2	1.5	2.2	5.0	13.9	18.8	3.9
Undetermined	4.0	2.3	1.6	2.0	3.2	2.8	—	2.3
All severities	**4.0**	**7.2**	**5.4**	**8.5**	**17.5**	**37.6**	**53.0**	**13.0**
Females								
Severe	—	1.9	1.4	2.4	4.3	9.5	38.0	4.9
Moderate	—	0.7	0.9	2.2	4.9	8.9	10.6	3.1
Mild	—	1.3	1.4	2.2	4.8	10.2	12.5	3.6
Undetermined	2.6	1.2	1.1	1.6	2.3	1.1	—	1.5
All severities	**2.6**	**5.1**	**4.8**	**8.3**	**16.3**	**29.7**	**61.1**	**13.1**
Persons								
Severe	—	2.3	1.3	2.2	3.9	8.8	31.4	4.0
Moderate	—	0.9	1.0	2.3	5.3	10.8	11.8	3.4
Mild	—	1.3	1.5	2.2	4.9	12.0	14.8	3.7
Undetermined	3.3	1.8	1.4	1.8	2.7	1.9	—	1.9
All severities	**3.3**	**6.1**	**5.1**	**8.4**	**16.9**	**33.4**	**58.1**	**13.0**

(a) Crude rate.

Source: Australian Bureau of Statistics 4120.0

Table A16: Average blood pressure by age group and sex, 1989

(mmHg)

Age group (years)	Systolic blood pressure		Diastolic blood pressure	
	Males	*Females*	*Males*	*Females*
20–24	124	112	75	69
25–29	122	113	78	72
30–34	123	113	79	72
35–39	126	114	82	74
40–44	126	118	82	76
45–49	130	126	84	79
50–54	135	131	86	83
55–59	140	136	87	83
60–64	142	140	85	82
65–69	144	146	85	84

Source: Risk Factor Prevalence Study Management Committee 1990

Table A17: Hypertensives(a) by age group and sex, 1989

(Per cent)

Age group (years)	*Not hypertensive*	*On tablets, uncontrolled* (b)	*On tablets, controlled* (c)	*Not on tablets* (d)
Males				
20–24	97.2	—	0.5	2.3
25–29	95.9	0.2	0.4	3.5
30–34	93.9	0.4	0.6	5.1
35–39	89.1	1.2	1.7	8.0
40–44	86.3	2.3	3.3	8.1
45–49	80.1	3.3	3.7	12.9
50–54	72.8	7.2	7.5	12.5
55–59	64.9	8.2	10.1	16.9
60–64	62.8	9.3	12.8	15.1
65–69	56.4	11.3	16.9	15.4
Females				
20–24	99.5	—	0.3	0.3
25–29	99.2	0.2	0.2	0.4
30–34	98.2	0.2	0.9	0.7
35–39	96.5	0.3	0.8	2.4
40–44	93.6	0.6	3.8	2.0
45–49	88.8	2.2	6.3	2.7
50–54	77.6	5.0	10.5	6.9
55–59	69.5	5.4	15.3	9.8
60–64	58.5	6.2	22.3	13.0
65–69	48.5	15.2	22.5	13.7

(a) On tablets, and/or systolic blood pressure ≥ 160 mmHg and/or diastolic blood pressure ≥ 95 mmHg.

(b) On tablets, systolic blood pressure ≥ 160 mmHg and/or diastolic blood pressure ≥ 95 mmHg.

(c) On tablets, systolic blood pressure < 160 mmHg and diastolic blood pressure < 95 mmHg.

(d) Not on tablets, systolic blood pressure ≥ 160 mmHg and/or diastolic blood pressure ≥ 95 mmHg.

Source: Risk Factor Prevalence Study Management Committee 1990

Table A18: Average blood cholesterol by age group and sex, 1989

(mmol / L)

	Age group (years)									
Sex	*20–24*	*25–29*	*30–34*	*35–39*	*40–44*	*45–49*	*50–54*	*55–59*	*60–64*	*65–69*
Males	4.63	5.07	5.10	5.49	5.64	5.78	5.90	5.84	5.90	5.76
Females	4.80	5.20	5.09	4.99	5.21	5.38	5.93	5.85	6.10	6.62

Source: Risk Factor Prevalence Study Management Committee 1990

Table A19: Proportion overweight or obese[(a)] by age group and sex, 1989

(Per cent)

	Age group (years)									
Sex	*20–24*	*25–29*	*30–34*	*35–39*	*40–44*	*45–49*	*50–54*	*55–59*	*60–64*	*65–69*
Males	26.6	37.0	43.6	52.2	53.6	61.1	60.8	62.6	62.1	61.8
Females	17.7	22.1	22.6	30.6	30.9	45.7	50.9	52.6	53.4	57.8

(a) Defined as body mass index > 25, where body mass index = weight (kg) / height $(m)^2$. Excludes 'not stated'.

Source: Risk Factor Prevalence Study Management Committee 1990

Table A20: Current smokers by age group and sex, 1989

(Per cent)

	Age group (years)										
Sex	*16–19*	*20–24*	*25–29*	*30–34*	*35–39*	*40–44*	*45–49*	*50–54*	*55–59*	*60–69*	*70 and over*
Males	20.0	41.0	38.9	36.7	35.4	32.3	26.3	22.1	25.5	21.4	20.8
Females	31.1	37.7	36.7	30.4	26.4	24.2	28.8	27.9	17.6	19.6	10.5

Source: Hill, White, Gray 1991

Table A21: Level of physical activity, 1984 to 1987

(Per cent)

	Survey date				
Level	*July 1984*	*Jan 1985*	*Jan 1986*	*July 1986*	*Jan 1987*
Sedentary (inactive)	32.9	29.5	33.4	27.9	25.4
Very active (aerobic)	15.3	12.5	12.2	16.4	17.9

Source: Bauman, Owen, Rushworth 1990

Table A22: Smokers by occupation, educational attainment and sex, 1980 and 1989

(Per cent)

	Males		Females	
Occupation / Educational attainment	*1980*	*1989*	*1980*	*1989*
Occupation				
Lower blue collar	47	43	30	31
Upper blue collar	45	32	32	28
Lower white collar	36	27	29	26
Upper white collar	30	20	31	22
Educational attainment				
9 years or less	44	35	31	28
10 or 11 years	41	37	32	29
12 years or more				
—Not a graduate	31	26	27	26
—Graduate	31	21	27	20

Source: Hill, Gray 1984
Hill, White, Gray 1991

Table A23: Breast cancer, predicted death rates with and without screening, 1991 to 2020[(a)]

(Per 100,000 population)

	Screening			Screening	
Year	*Without*	*With*	*Year*	*Without*	*With*
1991	37.9	37.9	2006	39.7	33.6
1992	38.0	38.0	2007	39.9	33.5
1993	38.1	38.1	2008	40.0	33.8
1994	38.3	38.1	2009	40.2	33.7
1995	38.4	38.0	2010	40.3	34.0
1996	38.5	37.6	2011	40.5	34.0
1997	38.6	36.7	2012	40.6	34.2
1998	38.7	36.0	2013	40.7	34.2
1999	38.9	34.8	2014	40.9	34.4
2000	39.0	34.2	2015	41.0	34.5
2001	39.1	33.4	2016	41.1	34.7
2002	39.2	33.4	2017	41.3	34.6
2003	39.3	33.1	2018	41.4	34.8
2004	39.5	33.4	2019	41.6	34.8
2005	39.6	33.3	2020	41.7	35.0

(a) Assumes 70 per cent compliance. Rates standardised to 1988 Australian population.

Source: Australian Institute of Health and Welfare

Table A24: Cervix cancer, age-standardised death rates(a), 1970 to 1990

(Per 100,000 population)

Year	*Rate*	*Year*	*Rate*	*Year*	*Rate*
1970	5.3	1977	3.7	1984	3.3
1971	4.7	1978	4.0	1985	3.5
1972	4.7	1979	3.7	1986	3.4
1973	4.9	1980	3.4	1987	3.1
1974	4.7	1981	3.7	1988	3.1
1975	4.4	1982	3.7	1989	3.2
1976	4.3	1983	3.5	1990	3.1

(a) Rates standardised to the World Standard Population.

Source: National Cancer Statistics Clearing House (unpublished)

Table A25: Proportion of population with basic and supplementary private hospital insurance, September 1983 to March 1995

(Per cent)

	Basic				*Supplementary*			
Year	*Mar*	*Jun*	*Sep*	*Dec*	*Mar*	*Jun*	*Sep*	*Dec*
1983			62.7	61.5			29.2	28.8
1984	54.3	50.0	48.9	47.9	30.0	29.6	30.2	30.0
1985	47.9	47.7	48.9	49.1	30.8	31.2	33.4	33.9
1986	49.0	48.8	48.6	49.2	34.1	34.2	34.9	35.7
1987	48.8	48.3	48.1	47.4	37.5	38.4	38.5	38.3
1988	47.0	47.0	46.8	46.1	38.2	38.4	38.6	38.4
1989	45.8	45.4	45.5	44.5	38.3	38.3	38.6	38.3
1990	44.6	44.4	45.0	44.4	38.6	39.0	39.6	39.3
1991	44.0	43.5	42.8	41.0	38.7	38.5	38.1	37.5
Projections								
1992	42.3	42.0	41.6	41.3	38.4	38.4	38.4	38.4
1993	41.0	40.7	40.4	40.0	38.4	38.4	38.4	38.4
1994	39.8	39.4	39.1	38.8	38.4	38.4	38.4	38.4
1995	38.5				38.4			

Source: Private Health Insurance Administration Council (unpublished)

Table A26: Students completing tertiary health professional courses in Australia, 1987 to 1990

Occupation	*1987*	*1988*	*1989*	*1990*
Medicine	1,354	1,509	1,495	1,316
Nursing	2,756	3,770	4,716	5,509
All health fields	7,596	8,977	10,168	10,953

Source: Department of Employment, Education and Training (unpublished)

Table A27: Graduates of Australian medical schools, actual and projected, 1981 to 2000

Actual				Projected[a]			
Year	*Number*	*Year*	*Number*	*Year*	*Number*	*Year*	*Number*
1981	1,254	1987	1,251	1992	1,091	1998	1,203
1982	1,300	1988	1,225	1993	1,230	1999	1,208
1983	1,341	1989	1,177	1994	1,263	2000	1,203
1984	1,356	1990	1,008	1995	1,267		
1985	1,347	1991	1,170	1996	1,243		
1986	1,243			1997	1,203		

(a) Projections for 1992 to 2000 assume no change to current policies.

Source: Deans of Medical Schools (unpublished)

Table A28: Commencing enrolments (excluding non-award) in health fields, 1991

Health field	*Full-fee-paying overseas students*	*All other students*
Podiatry	1	133
Optometry	7	223
Dietetics	23	239
Dentistry	27	285
Speech pathology / Audiology	9	364
Radiography	10	476
Pharmacy	60	552
Occupational therapy	10	659
Physiotherapy	35	792
Medicine[a]	233	1,978
Other health fields	135	3,900
Nursing	313	13,729

(a) Includes undergraduate training and postgraduate specialist training in tertiary institutions.

Source: Department of Employment, Education and Training (unpublished)

Table A29: Utilisation and bed supply[a], all acute hospitals, 1969–70 to 1989–90

(Per cent of 1969–70 value)

	1969 –70	*1974 –75*	*1979 –80*	*1982 –83*	*1984 –85*	*1985 –86*	*1987 –88*	*1989 –90*
Admissions per 1,000 population	100	110	116	114	117	119	119	127
Bed-days per 1,000 population	100	101	96	89	83	82	79	76
Average length of stay	100	91	83	77	71	69	67	60
Occupancy rate	100	98	90	86	86	90	92	94
Beds per 1,000 population	100	103	107	103	97	92	89	83

(a) Beds and bed-days calculated at 30 June.

Source: Australian Institute of Health and Welfare

Table A30: Range of standardised ratios(a) of surgical procedures across State statistical divisions, 1986

(Standardised ratio)

	NSW		*Vic*		*Qld*		*SA*	
Procedure	*Lower*	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*	*Lower*	*Upper*
Appendicectomy	82.7	154.4	79.2	130.5	53.3	115.8	67.6	99.8
Cholecystectomy	79.3	125.2	70.6	95.5	65.4	115.8	84.3	139.2
Tonsillectomy	80.1	161.7	49.6	129.2	27.7	117.1	98.4	181.0
Hysterectomy	85.0	134.6	59.5	147.9	79.9	138.1	80.0	133.0
Hip replacement	36.5	174.9	77.8	390.0	71.0	138.5	112.1	131.2
Lens insertion	53.0	127.2	50.0	101.7	47.8	225.9	39.2	105.0
Thyroidectomy	0.3	147.9	84.0	157.7	69.7	148.4	51.4	131.8
Bowel resection	60.7	114.3	61.4	115.9	72.6	138.8	79.7	110.4

(a) Ratio of State statistical division rates to the combined value.

Source: Renwick, Sadkowsky 1991

Table A31: Range of standardised ratios(a) of surgical procedures across Sydney and Melbourne metropolitan areas, 1986

(Standardised ratio)

	Sydney		*Melbourne*	
Procedure	*Lower*	*Upper*	*Lower*	*Upper*
Appendicectomy	85.4	136.4	65.4	106.4
Cholecystectomy	72.5	151.1	66.8	105.5
Tonsillectomy	63.3	143.3	58.7	107.1
Hysterectomy	63.3	135.2	57.7	105.8
Hip replacement	51.3	124.1	77.6	112.1
Lens insertion	79.0	162.1	62.1	102.3
Thyroidectomy	69.0	159.3	79.7	111.9
Bowel resection	67.3	134.2	90.2	113.9

(a) Ratio of Sydney and Melbourne rates to the combined value.

Source: Renwick, Sadkowsky 1991

Table A32: Average number of medical services processed per Medicare-enrolled person, by age and sex, 1990–91

(Number)

Age group (years)	*Males*	*Females*
0–4	8.7	7.9
5–9	4.7	4.6
10–14	4.0	4.1
15–19	4.2	7.2
20–24	4.2	9.4
25–34	4.6	10.4
35–44	5.5	9.5
45–54	7.2	11.0
55–64	10.7	12.9
65–74	11.0	15.0
75 and over	13.5	16.2
All ages	**6.5**	**9.9**

Source: Health Insurance Commission 1991

Table A33: Percentage change in per capita use of medical services by age and type of service, 1984–85 and 1989–90

(Per cent)

Age group / Type of service	*Males*	*Females*	*Persons*
Less than 20 years			
GP consultations	28.8	27.4	28.1
Specialist consultations	12.8	10.8	11.9
Pathology[a]	2.1	20.3	12.5
Radiology	26.0	23.4	24.7
Operations	9.1	2.0	6.8
Other[b]	14.6	9.1	10.6
All types	22.8	23.7	23.3
20 to 59 years			
GP consultations	22.5	19.8	20.8
Specialist consultations	10.0	11.0	10.6
Pathology[a]	35.1	40.0	38.6
Radiology	17.7	27.9	23.3
Operations	21.9	14.5	17.2
Other[b]	–4.6	–6.6	–5.8
All types	21.7	22.1	22.0
60 years and over			
GP consultations	14.8	8.7	10.6
Specialist consultations	37.2	31.8	33.9
Pathology[a]	63.5	59.0	60.6
Radiology	41.7	42.9	42.0
Operations	25.6	24.6	25.1
Other[b]	20.3	16.6	18.5
All types	28.7	21.9	24.2
All age groups / all types	**24.7**	**23.5**	**24.0**

(a) 1989–90 pathology service use was estimated on pre-1989 schedule structure.

(b) The change in per capita use reflects the deletion of venepuncture and intraveneous drip items from the Miscellaneous Procedures section of the Medicare Benefits Schedule.

Source: Deeble 1991

Table A34: Medical services, use per capita by States and Territories[(a)], 1984–85 to 1989–90

(Number)

Type of service / Year	*NSW*	*Vic*	*Qld*	*WA*	*SA*	*Tas*	*Aust*
Medical services excluding pathology							
1984–85	6.34	5.32	5.34	5.13	5.94	5.36	5.73
1985–86	6.14	5.61	5.62	5.23	6.29	5.55	6.03
1986–87	6.87	5.64	5.72	5.23	6.15	5.53	6.09
1987–88	7.14	5.86	6.02	5.34	6.29	5.69	6.32
1988–89	7.19	6.09	6.40	5.49	6.47	6.02	6.50
1989–90	7.49	6.34	6.87	5.76	6.78	6.20	6.79
Increase (per cent)	18.1	19.2	28.7	12.3	14.1	15.7	18.5
Average annual increase (per cent)	3.4	3.6	5.2	2.3	2.7	3.0	3.5
Pathology							
1984–85	1.64	1.19	1.65	1.21	1.04	1.12	1.41
1985–86	1.75	1.29	1.78	1.31	1.24	1.14	1.52
1986–87	1.93	1.44	1.90	1.45	1.21	1.33	1.68
1987–88	2.11	1.55	1.85	1.55	1.42	1.47	1.79
1988–89	2.22	1.65	2.03	1.65	1.52	1.65	1.90
1989–90[(b)]	2.31	1.75	2.14	1.73	1.59	1.74	2.01
Increase (per cent)	40.9	47.1	29.7	43.0	52.9	55.4	42.6
Average annual increase (per cent)	7.1	8.0	5.3	7.4	8.9	9.2	7.3
Total							
1984–85	7.98	6.51	6.99	6.34	6.98	6.48	7.14
1985–86	7.89	6.90	7.40	6.54	7.53	6.69	7.55
1986–87	8.80	7.08	7.62	6.68	7.36	6.86	7.77
1987–88	9.25	7.41	7.87	6.89	7.71	7.16	8.11
1988–89	9.41	7.74	8.43	7.14	7.99	7.67	8.40
1989–90	9.80	8.09	9.01	7.49	8.37	7.94	8.80
Increase (per cent)	22.8	24.3	28.9	18.1	19.9	22.5	23.2
Average annual increase (per cent)	4.2	4.4	5.2	3.4	3.7	4.1	4.3

(a) NSW data includes ACT, SA data includes NT.

(b) Pathology service use was estimated on a pre-1989 schedule structure.

Source: Deeble 1991

Table A35: Total cost at manufacturers' prices[a] of pharmaceutical drugs, 1990–91

	$ million	*Per cent*
Commonwealth programs[1]		
PBS—subsidised	754	57.5
PBS—non-subsidised[b]	140	10.7
RPBS	48	3.7
Miscellaneous[c]	43	3.3
All Commonwealth programs	985	75.1
Hospitals[2][d]	200	15.2
Private prescriptions[3]	127	9.7
All components	**1,312**	**100.0**

(a) Estimated by Australian Institute of Health and Welfare.

(b) This item relates to expenditure on drugs which receive no subsidy under the PBS, but which count towards the Safety Net arrangements.

(c) The main item in Miscellaneous is growth hormones, but the group also includes IVF drugs, colostomy and ileostomy appliances, etc.

(d) Hospital drug expenditure relates almost entirely to the provision of drugs in public hospitals, as most drugs used in private hospitals are provided to patients through community pharmacies under the PBS, RPBS or as private prescriptions.

Sources: (1) PBS information from HHCS, RPBS information from the Department of Veterans' Affairs
(2) Australian Institute of Health 1991
(3) Drug Utilisation Subcommittee of the Pharmaceutical Benefits Advisory Committee (unpublished)

Table A36: Prescription use per capita, 1980–81 to 1990–91

(Number)

Year	*PBS / RPBS benefits*	*Estimated total PBS / RPBS*	*Estimated total prescriptions*
1980–81	6.93	6.93	7.73
1981–82	7.46	7.46	8.23
1982–83	7.49	7.49	8.30
1983–84	7.64	7.64	8.48
1984–85	8.37	8.37	9.21
1985–86	8.20	8.20	9.16
1986–87	7.00	7.39	8.36
1987–88	6.65	7.85	8.82
1988–89	6.46	8.56	9.53
1989–90	6.61	8.55	9.54
1990–91	5.99	8.09	8.98

Source: Australian Institute of Health and Welfare

Table A37: Mortality differentials by CCLO major occupation group[a], males aged 25–54 years, 1985–1987

Major occupation group		*Death rate per 100,000*[b]	*Rate ratio*
0	Professional, technical and related workers	149	1.00
1	Administrative, executive and managerial workers	163	1.10
2	Clerical workers	160	1.07
3	Sales workers	199	1.33 *
4	Farmers, fishers, hunters, timber getters and related	239	1.60 *
5	Miners, quarrymen and related	243	1.63 *
6	Transport and communication	279	1.87 *
7 / 8	Tradesmen, production process workers and labourers	245	1.64 *
9 / 10	Service, sport and recreation, members of armed services	206	1.38 *

(a) See Box 4.4, page 185 for details of CCLO occupation groups.

(b) Age-standardised to 1988 Australian population.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from 1985–1987 mortality data

Table A38: Mortality differentials by occupational prestige and cause of death, males aged 25–54 years, 1985–1987

	Rate ratio[a]		
Cause of death (ICD-9 chapter)	*2nd–5th decile / 1st decile*	*6th–9th decile / 1st decile*	*10th decile / 1st decile*
Neoplasms	1.01	1.14	1.28 *
Endocrine, nutritional	1.01	0.93	1.20
Mental disorders	1.86	4.44 *	10.58 *
Nervous system	1.81	2.10	5.99 *
Circulatory system	1.20 *	1.65 *	2.30 *
Respiratory system	1.10	1.98 *	4.07 *
Digestive system	1.25	2.34 *	4.84 *
Genitourinary system	3.08	4.76	12.42
Injury and poisoning	1.12	1.95 *	2.65 *
All causes	1.11 *	1.59 *	2.26 *

(a) All rates age-standardised to 1988 Australian population.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from 1985–1987 mortality data

Table A39: Mortality differentials by occupational prestige and selected cause of death, males aged 25–54 years, 1985–1987

	Rate ratio(a)		
Selected cause of death	*2nd–5th decile / 1st decile*	*6th–9th decile / 1st decile*	*10th decile / 1st decile*
Stomach cancer	0.94	1.36	1.76
Colorectal cancer	0.83	0.66 *	0.62
Pancreatic cancer	1.49	1.49	1.86
Lung cancer	1.62 *	2.64 *	3.62 *
Prostate cancer	1.33	0.67	—
Brain cancer	0.58 *	0.60 *	0.62
Diabetes mellitus	1.28	1.98	3.49 *
Ischemic heart disease	1.17	1.56 *	2.02 *
Cerebrovascular disease	1.00	1.58 *	2.32 *
Pneumonia / influenza	0.66	1.52	3.83 *
Bronchitis, asthma and emphysema	1.31	1.74	3.32 *
Motor vehicle traffic accidents	1.39 *	2.52 *	2.97 *
Suicide	0.96	1.54 *	1.94 *

(a) All rates age-standardised to 1988 Australian population.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from 1985–1987 mortality data

Table A40: Mortality differentials by quintile of socioeconomic disadvantage(a), age group and sex, 1985–1987

	Rate ratio(b)			
	Age group (years)			
Quintile of socioeconomic disadvantage	*0 to 14*	*15 to 24*	*25 to 64*	*65 and over*
Males				
1st quintile	1.00	1.00	1.00	1.00
2nd quintile	1.15 *	1.24 *	1.17 *	1.05 *
3rd quintile	1.18 *	1.35 *	1.33 *	1.10 *
4th quintile	1.28 *	1.34 *	1.41 *	1.12 *
5th quintile	1.46 *	1.46 *	1.67 *	1.13 *
Females				
1st quintile	1.00	1.00	1.00	1.00
2nd quintile	1.10	0.96	1.16 *	1.04 *
3rd quintile	1.29 *	1.11	1.24 *	1.07 *
4th quintile	1.39 *	1.12	1.27 *	1.07 *
5th quintile	1.63 *	1.49 *	1.49 *	1.10 *

(a) Index of socioeconomic disadvantage for statistical local areas of residence (see Box 4.7, page 192).

(b) Ratio of each quintile to that of the first quintile. All rates age-standardised to 1988 Australian population.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from 1985–1987 mortality data

Table A41: Health differentials by marital status and sex, age 25–64 years, late 1980s

	Rate ratio[(a)]					
	Males			*Females*		
Marital status	*Deaths*[(b)]	*Disability*	*Serious chronic illness*	*Deaths*[(b)]	*Disability*	*Serious chronic illness*
Married	1.00	1.00	1.00	1.00	1.00	1.00
Never married	2.25 *	1.67 *	1.24 *	1.91 *	1.72 *	1.08
Separated / divorced / widowed	2.02 *	1.67 *	1.02	1.49 *	1.68 *	1.45 *

(a) Ratio of each group to 'married'. All rates age-standardised to 1988 Australian population.

(b) Marital status categories are 'Married / separated', 'Never married' and 'Divorced / widowed'.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from 1985–1987 mortality data, ABS 1988 Survey of Disability and Ageing, ABS 1989–90 National Health Survey

Table A42: Morbidity differentials by family composition and sex, age 25–64 years, 1989–1990

	Rate ratio[(a)]			
	Males		*Females*	
Family composition	*Reduced activity*	*Serious chronic illness*	*Reduced activity*	*Serious chronic illness*
Married, with dependent children	1.00	1.00	1.00	1.00
Married, no dependent children	0.89 *	1.01	1.53 *	1.22
Single parent with dependent children	1.35 *	0.59	2.50 *	1.69 *
Single not living alone, no dependent children	1.05	1.21	1.57 *	1.65 *
Single living alone	1.12 *	1.02	1.83 *	1.39 *

(a) Ratio of each group to 'married with dependent children'. All rates age-standardised to 1988 Australian population.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from ABS 1989–90 National Health Survey

Table A43: Mortality differentials by country of birth, age group and sex, 1985–1987

	Rate ratio[(a)]		
	Age group (years)		
Country of birth	*15 to 24*	*25 to 64*	*65 and over*
Males			
Australia	1.00	1.00	1.00
UK and Ireland	0.99	0.86 *	1.00
Other Europe	0.87	0.78 *	0.90 *
Asia	0.53 *	0.66 *	0.78 *
Other countries	0.99	0.90 *	0.94 *
Females			
Australia	1.00	1.00	1.00
UK and Ireland	0.78	0.90 *	0.98 *
Other Europe	0.81	0.72 *	0.91 *
Asia	0.68 *	0.72 *	0.82 *
Other countries	1.07	0.90 *	0.96

(a) Ratio of each country of birth to Australian-born. All rates age-standardised to 1988 Australian population.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from 1985–1987 mortality data

Table A44: Serious chronic illness differentials by country of birth, age group and sex, 1985–1987

	Rate ratio[(a)]		
	Age group (years)		
Country of birth	*15 to 24*	*25 to 64*	*65 and over*
Males			
Australia	1.00	1.00	1.00
UK and Ireland	1.32	0.90	1.06
Other Europe	0.63	0.70 *	0.80
Asia	0.30 *	0.67 *	1.17
Other countries	0.78	0.73 *	0.84
Females			
Australia	1.00	1.00	1.00
UK and Ireland	0.66	0.99	1.10
Other Europe	0.35	0.75 *	0.91
Asia	0.32 *	0.51 *	0.91
Other countries	0.72	0.70 *	0.89

(a) Ratio of each country of birth to Australian-born. All rates age-standardised to 1988 Australian population.

* $p < 0.01$

Source: Australian Institute of Health and Welfare, derived from ABS 1989–90 National Health Survey

Table A45: Aboriginal observed and expected number of deaths and standardised mortality ratios[a], by sex and selected regions, late 1980s

Selected region	Number of deaths Observed	 Expected	Standardised mortality ratio
Males			
Western New South Wales, 1984–1987[b]	205	56.8	3.6 (3.1–4.1)
Queensland communities, 1987–1989[b]	226	73.8	3.1 (2.7–3.5)
Western Australia, 1987–1988	387	156.9	2.5 (2.2–2.7)
South Australia, 1988–1989	155	45.4	3.4 (2.9–4.0)
Northern Territory, 1985	209	52.2	4.0 (3.5–4.6)
All regions	**1,182**	**378.8**	**3.1 (2.9–3.3)**
Females			
Western New South Wales, 1984–1987[b]	110	34.6	3.2 (2.6–3.8)
Queensland communities, 1987–1989[b]	168	38.4	4.4 (3.7–5.0)
Western Australia, 1985–1986	240	93.3	2.6 (2.2–2.9)
South Australia, 1988–1989	90	34.0	2.6 (2.1–3.2)
Northern Territory, 1985	151	37.4	4.0 (3.4–4.7)
All regions	**759**	**237.0**	**3.2 (3.0–3.4)**

(a) The estimated numbers of deaths and the SMRs may differ slightly from those provided in the sources, as they have been recalculated using the 1986 age-specific death rates of the total Australian male and female populations.

(b) See Glossary for details.

Sources: Thomson, Briscoe 1991
Gray, Hogg 1989

Table A46: Age-specific death rates by sex, Aborigines 1984 to 1989[a], and total Australian population 1986

(Per 1,000 population)

Age group (years)	Aborigines Males	 Females	Australia Males	 Females
0	26.3	23.5	10.2	7.8
1–4	1.7	0.7	0.5	0.4
5–14	0.6	0.3	0.2	0.2
15–24	4.0	1.8	0.7	0.3
25–34	7.8	3.2	1.4	0.5
35–44	16.0	6.0	1.4	0.7
45–54	25.2	15.8	2.8	1.7
55–64	46.5	35.5	8.5	4.6
65–74	72.4	49.2	22.4	11.7
75 and over	155.7	123.3	74.2	55.1

(a) The Aboriginal figures relate to western New South Wales (1984–1987), the Queensland communities (1987–1989), Western Australia (1987–1988), South Australia (1988–1989) and the Northern Territory (1985).

Source: Australian Institute of Health and Welfare

Table A47: Expectation of life at birth by sex, Aborigines 1984–1989 and total Australian population 1986

(Years)

	Males	*Females*
Aborigines		
Western New South Wales, 1984 to 1987	54.3	64.8
Queensland communities, 1987 to 1989	56.8	60.0
Western Australia, 1987 to 1988	58.3	65.7
South Australia, 1988 to 1989	55.0	66.8
Northern Territory, 1985	53.2	61.6
All regions	55.2	63.6
Australia 1986	72.9	79.2

Sources: Thomson, Briscoe 1991
Gray, Hogg 1989
Australian Institute of Health and Welfare

Table A48: Aboriginal deaths[(a)] by cause and sex, observed and expected rates, 1984–1989

(Per 100,000 population)

Cause of death	*Observed*	*Expected*	*Rate ratio*
Males			
Circulatory diseases	339	124	2.7
Injury and poisoning	205	59	3.5
Respiratory diseases	115	23	5.0
Neoplasms	100	76	1.3
Ill-defined conditions	62	8	7.4
Digestive diseases	58	11	5.5
Mental disorders	32	5	6.7
Infectious and parasitic	30	2	13.3
Endocrine, nutritional	29	7	4.4
Others	95	32	3.0
All causes	**1,065**	**346**	**3.1**
Females			
Circulatory diseases	192	76	2.5
Injury and poisoning	81	22	3.8
Neoplasms	80	54	1.5
Respiratory diseases	78	11	7.4
Endocrine, nutritional	44	5	9.2
Ill-defined conditions	44	5	8.1
Genitourinary	40	3	13.5
Infectious and parasitic	30	1	23.8
Digestive diseases	28	6	4.7
Others	68	26	2.6
All causes	**684**	**208**	**3.3**

(a) The Aboriginal figures relate to western New South Wales (1984–1987), the Queensland communities (1987–1989), Western Australia (1987–1988), South Australia (1988–1989) and the Northern Territory (1985).

Source: Australian Institute of Health and Welfare

Table A49: Infant and perinatal mortality rates, Aborigines[(a)] and total Australian population, 1972–1990

(Per 1,000 births[(b)])

	Aborigines		*Australia*	
Year	*Infant*	*Perinatal*	*Infant*	*Perinatal*
1972	77.7	57.5	16.7	23.4
1973	88.7	53.4	16.5	23.3
1974	59.7	72.9	16.1	23.2
1975	51.2	41.4	14.3	20.2
1976	56.6	58.9	13.8	20.2
1977	69.0	69.8	12.5	17.9
1978	38.7	35.0	12.2	16.5
1979	31.8	35.5	11.4	15.3
1980	32.8	39.2	10.7	14.6
1981	25.4	36.9	10.0	13.6
1982	30.0	35.8	10.3	13.7
1983	31.0	28.9	9.6	12.6
1984	24.7	30.5	9.2	12.2
1985	29.6	32.0	9.9	12.3
1986	26.3	35.1	8.8	11.9
1987	23.2	28.3	8.7	10.9
1988	27.5	31.2	8.7	11.2
1989	25.0	37.3	8.0	10.4
1990	22.5	35.5	8.2	10.8

(a) The Aboriginal figures relate to the Queensland communities (1972–1990), Western Australia (1978–1990), South Australia (1985–1990) and the Northern Territory (1972–1990).

(b) Infant mortality rate—per 1,000 live births; perinatal mortality rate—per 1,000 total births.

Source: Australian Institute of Health and Welfare

Table A50: Standardised hospital admission rates by sex and selected region, Aborigines and non-Aborigines, late 1980s

(Per 1,000 population)

	Aborigines		*Non-Aborigines*	
State / Territory	*Males*	*Females*	*Males*	*Females*
Western Australia, 1988	541	791	189	229
South Australia, 1989	605	620	224	260
Northern Territory, 1987–88	143	180	69	79

Source: Australian Institute of Health and Welfare

Table A51: Age-specific hospital admission rates by sex, Aborigines and non-Aborigines[(a)], late 1980s

(Per 1,000 population)

Age group (years)	Males			Females		
	Aborigines	*Non-Aborigines*	*Rate ratio*	*Aborigines*	*Non-Aborigines*	*Rate ratio*
0–4	767	272	2.8	735	188	3.9
5–14	146	106	1.4	141	85	1.7
15–24	176	122	1.4	563	240	2.3
25–34	329	126	2.6	626	342	1.8
35–44	495	145	3.4	512	223	2.3
45–54	460	205	2.2	637	245	2.6
55–64	544	334	1.6	560	288	1.9
65–74	522	510	1.0	505	389	1.3
75 and over	975	716	1.4	895	570	1.6
All ages(b)	394	198	2.0	517	235	2.2

(a) Figures for both Aborigines and non-Aborigines represent the combined data for Western Australia (1988), South Australia (1989) and the Northern Territory (1987–88).

(b) Standardised rates.

Source: Australian Institute of Health and Welfare

Table A52: Standardised hospital admissions rates by sex and cause, Aborigines and non-Aborigines[(a)], late 1980s

(Per 1,000 population)

ICD-9 chapter	*Aborigines*	*Non-Aborigines*	*Rate ratio*
Males			
Respiratory diseases	68	24	3.3
Injury and poisoning	61	25	2.4
Ill-defined conditions	38	14	2.8
Digestive diseases	35	24	1.4
Supplementary	35	26	1.2
Nervous system diseases	27	13	2.3
Circulatory diseases	24	17	1.3
Skin diseases	23	5	4.6
Infectious and parasitic	19	4	5.6
Mental disorders	17	4	3.9
Others	47	44	1.0
All causes(b)	394	198	1.9
Females			
Supplementary(c)	96	30	3.2
Pregnancy related	64	41	2.1
Respiratory diseases	62	19	3.6
Injury and poisoning	52	14	3.5
Ill-defined conditions	44	14	3.2
Digestive diseases	34	25	1.2
Genitourinary diseases	32	23	1.4
Nervous system	23	12	1.7
Skin diseases	20	4	4.7
Circulatory diseases	20	11	1.3
Others	69	42	0.8
All causes(b)	517	235	2.1

(a) Figures for both Aborigines and non-Aborigines represent the combined data for Western Australia (1988), South Australia (1989) and the Northern Territory (1987–88).

(b) Standardised rates.

(c) Includes admissions for uncomplicated pregnancies.

Source: Australian Institute of Health and Welfare

Table A53: Age-specific standardised edentulism ratios[(a)], by quartile of education and occupation and age group, 1987–1988

(SER)

	Quartile			
Age group (years)	*Lower*	*Lower-middle*	*Upper-middle*	*Upper*
Less than 35	5	7	1	1
35–44	81	62	46	25
45–54	226	92	151	79
55–64	321	196	251	162
65 and over	427	426	432	353

(a) See text for details of standardised edentulism ratio (SER).

Source: AIHW Dental Statistics and Research Unit

Table A54: Age-specific dental caries experience, by quartile of education and occupation, 1987–1988

(Mean number of teeth)

	Quartile			
Age group (years)	*Lower*	*Lower-middle*	*Upper-middle*	*Upper*
Decayed teeth				
Less than 15	0.52	0.56	0.38	0.38
15–24	1.76	1.46	1.40	1.02
25–34	2.66	1.93	1.81	1.20
35–44	1.96	1.63	1.38	1.02
45–54	1.48	1.47	1.42	1.18
55–64	1.37	1.59	1.33	1.07
65 and over	1.54	1.36	1.36	1.69
Missing teeth				
Less than 15	na	na	na	na
15–24	0.31	0.13	0.03	0.14
25–34	3.82	2.71	2.76	2.41
35–44	8.21	7.10	6.46	5.56
45–54	11.58	10.10	9.72	8.49
55–64	14.25	13.85	14.31	12.18
65 and over	17.27	17.59	16.56	15.78
Filled teeth				
Less than 15	0.29	0.15	0.13	0.14
15–24	3.67	3.59	3.63	3.30
25–34	7.53	8.80	8.50	9.65
35–44	8.16	9.39	10.54	12.16
45–54	7.33	7.94	8.82	11.38
55–64	5.37	6.37	7.10	9.60
65 and over	4.81	4.65	5.43	6.82
Decayed, missing and filled teeth				
Less than 15	0.45	0.35	0.14	0.38
15–24	5.73	5.18	5.06	4.47
25–34	14.00	13.43	13.06	13.26
35–44	18.32	18.12	18.37	18.74
45–54	20.39	19.51	19.96	21.04
55–64	20.99	21.81	22.73	22.85
65 and over	23.63	23.60	23.35	24.28

Source: AIHW Dental Statistics and Research Unit

Table A55: Age-standardised dental caries experience[(a)] of Aboriginal and Australian born non-Aboriginal children, Northern Territory, 1989

(Mean number of teeth)

	Aboriginal			*Non-Aboriginal*		
	Decayed	*Filled*	*Missing*	*Decayed*	*Filled*	*Missing*
Deciduous	1.49	0.33	0.05	0.55	0.84	0.05
Permanent	0.34	0.26	0.03	0.14	0.42	0.02

(a) Measured by an index of decayed, missing and filled teeth. See Box 2.5, page 57.

Source: AIHW Dental Statistics and Research Unit

Appendix 2

Methods and conventions

Details of unusual methods used in particular sections of the report are included in the text and Boxes, and in footnotes to Figures and Tables in the relevant sections. This Appendix provides supplementary notes and generally does not repeat the material included in the individual sections. Readers are also referred to the Glossary.

Data sources and methods

1. In compiling the data presented in this report, many of which were collected originally by agencies other than the Institute, attempts have been made to minimise the effects of variation in definitions and reference periods used.
2. Every attempt has been made to include the most recent data, but timeliness is limited largely by the time of release by data providers.
3. To facilitate the comparison of populations with differing age compositions, either different populations at a point in time or the same population at different points in time, age-standardisation has been used wherever possible (see Glossary).
4. The 1988 total Australian population has been used as the standard population for most standardisations, but the European and World Standard Populations have been used for some comparisons. Details of these three standard populations are provided in Table A59.
5. Where appropriate, measures of statistical significance have been included. In rates derived from population surveys, the standard error reflects the statistical uncertainty resulting from the fact that only a sample of the total population was included in the survey. Statistical significance tests do not take into account non-sampling errors, such as those which may arise from reporting biases or misclassification.
6. In this report, the statistical significance of estimates is indicated in one of two ways. In some sections, differences which are statistically significant (at the $p<0.01$ level) are indicated by an asterisk in the Tables. In the text, these differences are described generally as 'significant'. In other sections, the statistical significance of estimates is shown by confidence intervals—the limits within which estimates subject to sampling error can be expected to fall 95 per cent of the time.
7. Average annual rates of change or growth rates have been calculated using the geometric formula:

$$\text{Average rate of change} = ((P_n/P_o)^{1/N} - 1) \times 100$$

where P_n = later time period
P_o = earlier time period
N = number of years between the two time periods

This geometric rate of change averages out variations in the actual annual changes that may have occurred between the two time periods.

8. The classification of diseases follows the conventions laid down by the World Health Organization in the ninth revision of the *Manual of the international statistical classification of diseases, injuries, and causes of death* (ICD-9) (WHO 1977), and as adapted for hospital indexing by the *International classification of diseases, 9th revision, clinical modification (ICD-9-CM)* (1991). Details of the main Chapters of ICD-9 and the 40 leading procedure and diagnostic codes of ICD-9-CM are provided in Tables A56, A57 and A58.

Presentation

9. The presentation of text in this report generally follows the style embodied in the Commonwealth *Style manual for authors, editors and printers* (1988).
10. The format of text references uses a simplified version of the author-date (or Harvard) system. Similarly, the presentation of references at the end of each chapter uses a simplified Harvard system.
11. General references to ABS series (for example, the *Deaths, Australia* series) provide full identifying information, including Catalogue number, but do not include a year of publication. References to specific issues within a series follow standard referencing procedures.
12. Reference in Tables and Figures to unpublished work of the Institute has been abbreviated by omitting the word 'unpublished'. Reference to unpublished work of other agencies has been made in the standard manner.
13. To distinguish between a period of (or part of) two consecutive years and a financial year, a period of years is shown in full (for example, 1989–1990) and the financial year in the standard way (for example, 1989–90).
14. In general, countries other than Australia are shown in Tables and Figures in alphabetical order.
15. The presentation of Australian States and Territories follows the order of precedence used for the Conferences of Premiers and Chief Ministers.
16. Where figures have been rounded, discrepancies may occur between the sums of the components and totals. Published figures are calculated prior to rounding and therefore some discrepancy may exist between these figures and those that could be calculated from the rounded figures.
17. In the text, percentages have been presented generally to two significant digits. That is, percentages greater than 10 are generally presented without a decimal place, and those less than 10 with one decimal place. However, exceptions to this convention have been made in appropriate places—for example, in the comparison of two percentages where one is less than 10 and the other slightly greater than 10.
18. The following symbols are used in this report:

$	Australian dollars, unless otherwise specified
–	zero
%	per cent
b	billion
g	gram
kg	kilogram
m	million
mmHg	millimetres of mercury

mmol/L	millimoles per litre
na	not available
nec	not elsewhere classified

Geographic classifications

19. Within Australia, most regional comparisons are between States and Territories.
20. Largely reflecting variations in the classifications used in the data sources, the definitions for other regional comparisons are not always precise.
21. For example, in some sections of the report comparisons are made between major urban and other areas. This classification is based on information provided to the Institute by State and Territory health authorities. In 1989–90, the only areas apart from the capital cities classified as major urban were Newcastle, Wollongong, Geelong and Launceston.
22. Theoretically, comparison between metropolitan and non-metropolitan areas should be straightforward, as, strictly defined, the only metropolitan areas are those of the capital cities of each State and Territory. In practice, however, there are some inconsistencies in the use of these terms in data sources. For example, some sources do not include all capital cities, while others include other major urban areas (such as Newcastle and Wollongong).

Table A56: ICD-9 Chapter titles and standard abbreviated forms

Chapter number / Code	*Title*	*Short forms*
I	Infectious and parasitic diseases	Infectious and parasitic; Infectious
II	Neoplasms	Neoplasms
III	Endocrine, nutritional and metabolic diseases, and immunity disorders	Endocrine, nutritional; Endocrine
IV	Diseases of blood and blood-forming organs	Blood diseases; Blood
V	Mental disorders	Mental disorders; Mental
VI	Disease of the nervous system and sense organs	Nervous system diseases; Nervous
VII	Diseases of the circulatory system	Circulatory diseases; Circulatory
VIII	Diseases of the respiratory system	Respiratory diseases; Respiratory
IX	Diseases of the digestive system	Digestive diseases; Digestive
X	Diseases of the genitourinary system	Genitourinary diseases; Genitourinary
XI	Complications of pregnancy, childbirth and puerperium	Complications of pregnancy, Complic preg
XII	Diseases of the skin and subcutaneous tissue	Skin diseases; Skin
XIII	Diseases of the musculoskeletal system and connective tissue	Musculoskeletal diseases, Musculoskeletal
XIV	Congenital anomalies	Congenital anomalies; Congenital
XV	Certain conditions originating in the perinatal period	Perinatal conditions; Perinatal
XVI	Symptoms, signs and ill-defined conditions	Ill-defined conditions; Ill-defined
XVII	Injury and poisoning	Injury and poisoning; Injury
V	Supplementary classification of factors influencing health status and contact with health services	Supplementary; Suppl
E	Supplementary classification of external causes of injury and poisoning	External causes of injury and poisoning; Injury and poisoning; Injury

Source: World Health Organization 1977

Table A57: Leading 40 ICD-9-CM procedure codes

Code	*Description*
135	Other extracapsular extraction of lens
200	Myringotomy
231	Surgical removal of tooth
282	Tonsillectomy without adenoidectomy
332	Diagnostic procedures on lung and bronchus
372	Diagnostic procedures on heart and pericardium
385	Ligation and stripping of varicose veins
399	Other operations on vessels
441	Diagnostic procedures on stomach
451	Diagnostic procedures on small intestine
452	Diagnostic procedures on other intestine
470	Appendicectomy
512	Cholecystectomy
530	Unilateral repair of inguinal hernia
542	Diagnostic procedures of abdominal region
573	Diagnostic procedures on bladder
602	Transurethral prostatectomy
640	Circumcision
663	Other bilateral destruction or occlusion of fallopian tubes
673	Other excision or destruction of lesion or tissue of cervix
684	Total abdominal hysterectomy
690	Dilation and curettage of uterus
695	Aspiration curettage of uterus
721	Low forceps operation with episiotomy
722	Mid forceps operation
730	Artificial rupture of membranes
736	Episiotomy
741	Low cervical cesarean section
756	Repair of other current obstetric laceration
786	Removal of internal fixation device
790	Closed reduction of fracture without internal fixation
793	Open reduction of fracture with internal fixation
852	Excision or destruction of breast tissue
860	Incision of skin and subcutaneous tissue
862	Excision or destruction of lesion or tissue of skin and subcutaneous tissue
863	Other local excision or destruction of lesion or tissue of skin and subcutaneous tissue
865	Suture of skin and subcutaneous tissue
885	Angiocardiography using contrast material
990	Transfusion of blood and blood components
992	Injection or infusion of other therapeutic or prophylactic substance

Source: *International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM)* 1991

Table A58: Leading 40 ICD-9-CM diagnoses

Code	*Description*
162	Malignant neoplasm of trachea, bronchus, and lung
173	Other malignant neoplasm of skin
250	Diabetes mellitus
345	Epilepsy
366	Cataract
410	Acute myocardial infarction
413	Angina pectoris
414	Other forms of chronic ischemic heart disease
427	Cardiac dysrhythmias
428	Heart failure
436	Acute, but ill-defined cerebrovascular disease
474	Chronic disease of tonsils and adenoids
493	Asthma
496	Chronic airway obstruction, not elsewhere classified
530	Diseases of esophagus
540	Acute appendicitis
550	Inguinal hernia
558	Other noninfectious gastroenteritis and colitis
574	Cholelithiasis
599	Other disorders of urethra and urinary tract
626	Disorders of menstruation and other abnormal bleeding from female genital tract
634	Spontaneous abortion
635	Legally induced abortion
642	Hypertension complicating pregnancy, childbirth and the puerperium
644	Early or threatened labor
650	Delivery in a completely normal case
656	Other fetal and placental problems affecting management of mother
664	Trauma to perineum and vulva during delivery
682	Other cellulitis and abscess
724	Other and unspecified disorders of back
780	General symptoms
786	Symptoms involving respiratory system and other chest symptoms
788	Symptoms involving urinary system
789	Other symptoms involving abdomen and pelvis
813	Fracture of radius and ulna
820	Fracture of neck of femur
854	Intracranial injury of other and unspecified nature
V25	Contraceptive management
V56	Aftercare involving intermittent dialysis
V58	Other and unspecified aftercare

Source: *International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM)* 1991

Table A59: Standard populations

Age group (years)	*Australia, 30 June 1988*	*European*	*World*
0	245,459	1,600	2,400
1–4	980,347	6,400	9,600
5–9	1,216,629	7,000	10,000
10–14	1,248,132	7,000	9,000
15–19	1,411,846	7,000	9,000
20–24	1,324,165	7,000	8,000
25–29	1,404,037	7,000	8,000
30–34	1,325,799	7,000	6,000
35–39	1,276,228	7,000	6,000
40–44	1,170,652	7,000	6,000
45–49	897,696	7,000	6,000
50–54	771,551	7,000	5,000
55–59	738,139	6,000	4,000
60–64	729,342	5,000	4,000
65–69	623,064	4,000	3,000
70–74	480,550	3,000	2,000
75–79	351,711	2,000	1,000
80–84	203,383	1,000	500
85 and over	139,423	1,000	500
Total	16,538,153	100,000	100,000

Source: World Health Organization 1992
Australian Bureau of Statistics 1989

References

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Glossary

Definitions of the medical and epidemiological terms included in this Glossary have been derived largely from *Dorland's Illustrated Medical Dictionary* (1985), the *Concise medical dictionary* (1980) and Last (1983).

Aboriginal communities The Queensland communities mentioned in Section 4.2 are: Aurukun, Bamaga, Cherbourg, Doomadgee, Gununa (Mornington Island), Hopevale, Kowanyama, Lockhart River, Palm Island, Pormpuraaw (Edward River), Weipa, Woorabinda, Wujal Wujal and Yarrabah.

Aborigine See *Australian Aborigine/Torres Strait Islander.*

ABS Australian Bureau of Statistics.

acute hospitals See *hospitals.*

acute Having a short and relatively severe course.

ADEC Australian Drug Evaluation Committee.

admission Admission to hospital. In this report, the number of *separations* has been taken as the number of admissions.

admission rate The number of admissions per 1,000 total population per year. See *separation rate.*

age-specific death rate Number of deaths of persons of a specific age group in one year per 1,000 persons of the same age group.

age-specific fertility rate The number of live births to women in a specified age group in one year per 1,000 women in the same age group.

age-specific rate A rate for a specific age group. The numerator and denominator relate to the same age group.

age-standardised Weighted average of age-specific rates according to a standard distribution of age to eliminate the effect of different age distributions and thus facilitate valid comparison of groups with differing age compositions.

AHMAC Australian Health Ministers' Advisory Council.

AHMC Australian Health Ministers' Conference.

AHS Australian Health Survey (conducted by the Australian Bureau of Statistics in 1977–1978 and 1983).

AHTAP Australian Health Technology Advisory Committee.

AIDS Acquired Immune Deficiency Syndrome.

AIH Australian Institute of Health.

AIHW Australian Institute of Health and Welfare.

AMC Australian Medical Council.

ANC Australian Nursing Council.

ANRAC Australian Nurse Registering Authorities Council.

ASCO Australian Standard Classification of Occupations. A classification of occupations based on the principle that occupations should be classified using intrinsic criteria, rather than extrinsic criteria such as industry, as had been the case prior to 1986. See also *CCLO*.

ANU-2 scale An index which ranks occupations (defined by the 3 digit CCLO classification) according to occupational prestige as perceived by the community.

Australian Aborigine/Torres Strait Islander A person of Aboriginal or Torres Strait Islander descent who identifies as an Aborigine or Torres Strait Islander and is accepted as such by the community in which he (she) lives (Department of Aboriginal Affairs 1981).

average length of stay The average of the *lengths of stay* for all inpatients. For acute hospitals, a reasonable estimate is obtained by dividing total *bed-days* by *total admissions* (or *separations*).

bed-day The occupancy of a hospital bed by an inpatient for up to 24 hours.

bed ratio The number of beds per 1,000 population.

BHC Better Health Commission.

billion A thousand million.

bulk bill See *direct bill*.

capital expenditure Expenditure of a non-recurrent nature (for example, new buildings, equipment used for a number of years).

casemix A means of classifying hospital patients to provide a common basis for comparing cost effectiveness and quality of care across hospitals. See *DRG*.

cause of death Based on information reported on the death certificate, each death is classified to the underlying cause of death according to rules and conventions of the ninth revision of the International Classification of Diseases (ICD-9) (WHO 1977). The underlying cause is defined as the disease or injury which initiated the train of events leading directly to death. Violent deaths are classified according to the external cause—the circumstances of the violence which produced the fatal injury, rather than to the nature of the injury. See Appendix 2 for details of the various ICD-9 chapters, and for codes for leading diagnoses and procedures.

CCLO Classification and Classified List of Occupations, based partially on industry classifications. See also *ASCO*.

CHD Coronary heart disease.

chronic Persisting over a long period.

congenital A condition that is recognised at birth, or that it is believed to have been present since birth—includes conditions which are inherited or caused by an environmental factor.

cohort Group of individuals sharing a statistical characteristic (for example, date of birth) who are used in epidemiological or other statistical studies.

CPCM Conference of Premiers and Chief Ministers.

crude death rate Number of deaths in a specified period per 1,000 total population.

crude birth rate Number of births in a specified period per 1,000 total population.

CT Computerised tomography.

cumulative rate Proportion of an initially disease-free group developing a disease over a fixed time interval.

cumulative rate per cent Cumulative rate expressed as per cent.

DBP diastolic blood pressure.

direct bill The process by which a medical practitioner or optometrist sends the bill for some or all his/her patients direct to Medicare.

disability A non-fatal consequence of disease and injury which has lasted, or is likely to last, for 6 months or more. Disabling conditions are subdivided into:

mental disorders—including mental retardation, mental degeneration, slowness at learning, and other mental disorders; and

physical conditions—including loss of sight, loss of hearing, incomplete use of limbs or digits, restriction in physical activities or in doing physical work, and long-term conditions requiring treatment or medication.

disabled person See *person with a disability.*

DMFT, dmft Decayed, missing or filled teeth. See Box 2.5, page 57.

DRG Diagnosis related group. DRGs classify about 460 types of cases encountered in acute hospitals on the basis of principal diagnosis, principal procedure performed (if any), age, sex and other clinical information. Each DRG represents a class of patient requiring similar hospital services. See *casemix.*

DUSC Drug Utilisation Subcommittee of the Pharmaceutical Benefits Advisory Committee.

ECMO extracorporeal membrane oxygenation.

edentulism The loss of all natural teeth.

employed person See *employment status.*

employment status Employed persons are those aged 15 years and over who, during the reference week: worked for one hour or more for pay; worked for one hour or more without pay in a family business; or who had a job but were not at work because of leave or other reasons. Unemployed persons are those aged 15 years and over who were not employed in the reference week and: had actively looked for work; were available for work; or were waiting to start a new job or be called back to a job from which they had been stood down for less than 4 weeks. The labourforce comprises employed and unemployed persons; other persons are described as not in the labourforce (ABS 6203.0).

epidemic The occurrence in a community or region of cases of an illness, specific health-related behaviour or other health related events clearly in excess of normal expectation.

epidemiology The study of the distribution and determinants of health-related states and events in populations, and the application of this study to control of health problems.

episode of care The time between the formal admission to hospital and discharge, transfer to another health institution or death. If a patient is re-admitted for further treatment (even for the same condition), a second episode of care occurs. If a patient receives treatment at one hospital and is transferred to another hospital, a second episode of care begins at the time of transfer.

expectation of life Predicted number of years of life remaining to a person if the present pattern of mortality does not change.

female In this report, female persons of any age.

fertility rate See *age-specific fertility rate.*

fetal death Birth of a fetus weighing at least 500 grams (or where birthweight is unavailable, of at least 22 weeks gestation), which shows no signs of life.

fetal death rate Number of fetal deaths per 1,000 total births (fetal deaths plus live births).

GDP Gross domestic product.

GP General practitioner.

handicap Limitation in the performance of tasks in one or more of five functional areas —self-care, mobility, verbal communication, schooling and employment—as a result of disability.

handicapped person See *person with a handicap.*

health care Care for the ill. It may or may not include treatment; it does not include *health promotion* or disease prevention.

health promotion Activities to improve health and prevent disease.

HIV Human immunodeficiency virus, the virus responsible for AIDS.

HHCS Commonwealth Department of Health, Housing and Community Services.

hospital episode See *episode of care.*

hospitals and other institutions

acute hospitals Establishments which provide at least minimal medical, surgical or obstetrical services for inpatient treatment and/or care, and which provide round-the-clock comprehensive qualified nursing service as well as other necessary professional services. They must be licensed by their State or Territory health authority, or controlled by other government agency. Most of the patients have acute conditions or temporary ailments and the average stay per admission is relatively short.

hostels Establishments run by public authorities or registered non-profit organisations to provide board, lodging or accommodation for the aged, distressed, or disabled who cannot live independently but do not need nursing care in a hospital or nursing home. Only hostels subsidised by the Commonwealth are included. Residents are generally responsible for their own provisions, but may be provided in some establishments with domestic assistance (meals, laundry, personal care).

nursing homes Establishments which provide long-term care involving regular basic nursing care to chronically ill, frail, disabled or convalescent persons or senile inpatients. In practice, they cater mainly for older people. They must be approved by HHCS and/or licensed by the State or Territory, or controlled by government departments.

private hospitals Privately owned and operated institutions approved by HHCS. Private hospitals cater only for private patients who are treated by a doctor of their own choice and are charged fees for accommodation and medical services. Private hospitals can be classified as acute or psychiatric on the basis of the proportion of acute inpatient services provided.

psychiatric hospitals Establishments devoted primarily to the treatment and care of inpatients with psychiatric, mental, or behavioural disorders.

public hospitals As determined by the State or Territory health authority, and includes both recognised and non-recognised hospitals. Recognised hospitals are those nominated by States and Territories and accepted by the Commonwealth and appearing in schedules to each State/Territory Medicare Agreement (Schedule B in the current Medicare Agreements). They provide free shared-ward accommodation for all who require it and free treatment there by a hospital-appointed doctor. In addition, they provide, to those who are prepared to pay for it (for example, through private insurance), private ward accommodation and the doctor of choice. Thus, public hospitals service much private medical practice as well as public.

repatriation hospitals Acute care hospitals run by the Commonwealth Department of Veterans' Affairs originally set up to provide hospital treatment for eligible veterans and their dependants at Commonwealth expense.

HTIC Health Targets and Implementation (Health for All) Committee.

hypertension Elevated blood pressure, defined as a diastolic blood pressure (DBP) of 95 mmHg or more and/or a systolic blood pressure (SBP) of 160 mmHg or more.

ICD See *International Classification of Disease.*

immunisation The production of immunity by artificial means. Passive immunity, as produced by antisera, is temporary; active immunity involves production by the body of its own antibodies—see *vaccination.*

incidence The number of instances of illness commencing, or of persons falling ill, during a given period in a specified population. Sometimes used to denote *incidence rate.*

incidence rate The number of instances of illness commencing, or of persons falling ill, during a given period in a specified population divided by the population at risk.

incubation period The time interval between invasion by an infectious agent and the appearance of the first sign or symptom of the disease in question.

index of education and occupation See *socioeconomic indexes for areas.*

index of relative socioeconomic disadvantage See *socioeconomic indexes for areas.*

infant death Death of an infant within a year of birth.

infant mortality rate Number of infant deaths per 1,000 live births.

infectiousness A characteristic of the disease that concerns the relative ease with which it is transmitted to others.

inpatient Any person formally admitted by a hospital. Healthy newborn infants are excluded unless they have a stay of more than 10 days, or are the second or subsequent birth in multiple births.

institutional In this report, denotes the major health care institutions, such as hospitals and nursing homes.

intersectoral The involvement of government sectors other than the health sector, and of private and public sectors. An example of intersectoral collaboration is the recent attempt by the health and agricultural sectors to change meat pricing practices to reflect the greater health benefits of lean meat over animal fat.

IPD1 deflator Index used to adjust institutional health costs to allow for inflation. It is the ABS implicit price deflator for government consumption expenditure on health, social security and welfare.

International Classification of Disease (ICD) WHO's internationally accepted classification of death and disease—the ninth revision (ICD-9) is currently in use (WHO 1977). The major chapters of ICD are listed in Appendix 2, along with selected procedure and other codes. In this publication, where used in time series, causes of death classified before 1979 under previous revisions of ICD have been reclassified to ICD-9 by AIHW.

ISIS Injury Surveillance Information System, operated by 12 regional groups capturing data from about 50 hospital emergency departments from all States and the Australian Capital Territory.

labourforce See *employment status.*

length of stay The difference, in completed days, between the dates of admission and *separation.* Where a patient is admitted and discharged on the same day, the length of stay is taken as one day.

life expectancy See *expectation of life.*

low birthweight Birth of a baby weighing less than 2,500 grams.

male In this report, male persons of any age.

man In this report, adult male.

MAS Minimal access surgery.

maternal direct deaths Deaths resulting from obstetric complications of the pregnant state. See also *total maternal deaths.*

Medicare Benefits Schedule A compilation of the professional medical services which are subject to the payment of benefits by Medicare against expenses incurred by Australian residents. The Schedule is determined by regulation. Known before Medicare as the Medical Benefits Schedule. The Schedule fee is the value for each professional medical service in the Schedule from which the maximum benefit is calculated. The Schedule fee is not a recommended fee nor is it a maximum fee.

MONICA A multi-centre international collaborative project measuring trends in cardiovascular mortality and morbidity and assessing the extent to which these trends are related to changes in risk factor levels and/or medical care. The project is coordinated by WHO.

morbidity Any departure, subjective or objective, from a state of physiological or psychological wellbeing.

mortality Death.

MRI Magnetic resonance imaging.

MWDRC Medical Workforce Data Review Committee.

National Minimum Data Set for Institutional Health Care A set of recommended definitions for use in measuring facilities in, and use of, hospitals and related institutions.

NBHP National Better Health Program.

NCADA National Campaign Against Drug Abuse.

NCEPH National Centre for Epidemiology and Population Health.

NDAIC National Drug Abuse Information Centre.

neonatal death Death of an infant within 28 days of birth.

neonatal mortality rate Number of neonatal deaths per 1,000 live births.

NHF National Heart Foundation of Australia.

NHMRC National Health and Medical Research Council.

NHS National Health Survey (conducted in 1989–1990 by the Australian Bureau of Statistics).

NHTAP National Health Technology Advisory Panel.

NISU AIHW National Injury Surveillance Unit.

non-inpatient Patients not requiring admission to hospital, but who receive treatment ed in accident and emergency (casualty) departments, undergo short-term specialist treatment (such as minor surgery, radiotherapy or chemotherapy), or are treated in their own homes through home nursing programs. Previously referred as outpatients.

not in the labourforce See *employment status.*

NPSU AIHW National Perinatal Statistics Unit.

nursing home See *hospitals and other institutions.*

occupancy rate The ratio of total bed-days in a year to total possible bed-days (where the latter is available beds multiplied by 365).

OECD Organisation for Economic Co-operation and Development, comprises a set of 24 developed countries, including most Western European countries, the United States and Australia.

outpatient See *non-inpatient.*

over-the-counter drugs (OTC) Pharmaceutical drugs available without prescription. Examples are cough mixtures, simple analgesics and antacids. Some OTCs can be sold only by pharmacists, but many can be sold through non-pharmacy outlets.

Pap smear Papanicolaou smear—a procedure for the detection or diagnosis of malignant and pre-malignant conditions of the female genital tract.

PBS Pharmaceutical Benefits Scheme.

perinatal Pertaining to or occurring in the period shortly before or after birth.

perinatal death Fetal or neonatal death.

perinatal mortality rate Number of perinatal deaths per 1,000 total births (fetal deaths plus live births).

person with a disability A person with one or more disabilities which have lasted, or are likely to last, for six months or more.

person with a handicap A person with one or more handicaps.

PHIAC Private Health Insurance Administration Council.

postneonatal death Death of an infant between 28 days and one year of life.

postneonatal mortality rate Number of postneonatal deaths per 1,000 live births.

potential years of life lost 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. These drugs are also known as Schedule for (or S-4) drugs after the schedule to the State and Territory Acts of Parliament that regulates the sale and distribution of poisons and drugs. Prescription drugs are available only from pharmacists who are regulated by State and Territory laws whether they work in community or in hospital pharmacies.

prevalence The number of instances of a given disease or other condition in a given population at a designated time—sometimes used to mean prevalence rate.

prevalence rate The number of instances of a given disease or other condition in a given population at a designated time divided by the population at risk of having the disease or condition.

private health insurance Insurance which can be purchased to cover charges in private hospitals, and for private status in public hospitals. Registered health benefit funds also sell ancillary insurance for services not covered by Medicare, notably private dentistry, physiotherapy, chiropractic and appliances, and for prescribed medicines not covered by pharmaceutical benefits.

private hospital See *hospitals and other institutions.*

psychiatric hospital See *hospitals and other institutions.*

public health One of the efforts organised by society to protect, promote, and restore the people's health. It is the combination of sciences, skills, and beliefs that are directed to the maintenance and improvement of the health of all the people through collective or social actions. The programs, services, and institutions involved emphasise the prevention of disease and the health needs of the population as a whole. Public health activities change with changing technology and social values, but the goals remain the same: to reduce the amount of disease, premature death, and disease-produced discomfort and disability in the population. Public health is thus a social institution, a discipline, and a practice.

public hospital See *hospitals and other institutions.*

publicly funded hospital See *hospitals and other institutions.*

quality adjusted life years (QALYs) A measure of the outcome of actions (either individual or treatment interventions) in terms of their health impact. If an action gives a person an extra year of healthy life expectancy, that counts as one QALY. If an action gives a person an extra year of unhealthy life expectancy (partly disabled or in some distress), it has a value of less than one. Death is rated at zero.

quality assurance The process of providing, through a range of mechanisms, a credible guarantee that the quality of health services is at an optimum standard in the particular circumstance.

rate ratio The ratio of two rates—used to indicate the relative rates between two populations of a particular disease or condition.

real cost Cost expressed in terms which have been adjusted for inflation (for example, in 1984–85 dollars). This enables comparisons to be made between expenditures in different years.

recurrent expenditure Expenditure which recurs continually or very frequently (for example, salaries). It may be contrasted with capital expenditure, such as the cost of hospital buildings and diagnostic equipment, for which the expenditure is made infrequently.

relative risk The ratio of the risk of disease or death among the exposed to the risk among the unexposed.

repatriation hospital See *hospitals and other institutions.*

RFPS Risk Factor Prevalence Study (a series of three surveys conducted by the National Heart Foundation of Australia in 1980, 1983 and 1989).

risk factor An attribute or exposure that is associated with an increased probability of a specified outcome, such as the occurrence of a disease. Not necessarily a causal factor.

risk The probability that an event will occur.

Schedule fee See Medicare Benefits Schedule.

separation (or discharge) Occurs when an inpatient leaves hospital to return home, transfers to another institution, or dies. See *admission.*

separation rate The number of separations per 1,000 total population per year. See *admission rate.*

sex ratio Number of events occurring to males in the population divided by the number of similar events occurring to females in the same population.

socioeconomic indexes for areas The Australian Bureau of Statistics has constructed a number of socioeconomic indices designed to categorise areas on the basis of social and economic information collected in the 1986 Population Census (ABS 1356.0). The indexes used in this report are the Index of relative socioeconomic disadvantage and the Index of Education and Occupation.

STD Sexually transmitted disease.

stillbirth See *fetal death.*

stillbirth rate See *fetal death rate.*

symptom Any functional evidence of disease or of a patient's condition.

Torres Strait Islander See *Australian Aborigine/Torres Strait Islander.*

total bed-days The sum of the lengths of stay of all inpatients for a given period.

total fertility rate The number of live births a woman would have if, throughout her reproductive years, she had children at the rates prevailing in the reference calendar year. It is the sum of the age-specific fertility rates for that calendar year.

total maternal deaths Direct deaths plus indirect deaths (those resulting from pre-existing disease or disease that developed during pregnancy but not due to direct obstetric causes).

unemployed person See *employment status.*

vaccination The production of active immunity by the use of treated antigen to stimulate the body to produce its own antibodies. See also *immunisation.*

WHO World Health Organization.

woman In this report, adult female.

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