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Australia's health 2004 : the ninth biennial report of the Australian Institute of Health and Welfare

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Australia's HEALTH 2004

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

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Preface

Welcome to *Australia's Health 2004*, the ninth edition of our biennial health report to the nation. Producing it is at the heart of AIHW's mission of 'better health and wellbeing for Australians through better health and welfare statistics and information'. As this report makes clear, there is plenty to be happy about with the health of Australians and their health services, as well as some serious challenges.

Health continues to be a growing and increasingly complex field of competing priorities from all perspectives—from the individual to governments, business, the health professions and the health services system. This is perhaps inevitable in a field of endeavour that costs Australia over 9% of its gross domestic product, or over $3,500 per person.

As with most other OECD countries, health in Australia has been a story of seemingly relentless expenditure growth over the last few years, with some areas driving health cost increases more strongly than others. In Australia this is particularly the case with pharmaceuticals, dental services, and aids and appliances. There are areas of nursing and medical practitioner shortages as these workforces continue to get older and, in the case of doctors, they choose to work fewer hours than previously. Yet 50% of people undergoing elective surgery are treated within 4 weeks, although 4.5% wait more than a year.

In the meantime the health landscape continues to change and evolve. The ageing of the population is shifting the dynamics of problems managed and services offered. Most aged people are in good health, and maintaining this has been a priority. That is why, in this edition of *Australia's Health*, we are pleased to offer a special chapter on the Health of Older Australians. In doing so we are adding to significant work already undertaken by the AIHW on the community services aspects of ageing in our sister flagship, *Australia's Welfare*, and the broad view of older Australians outlined in our *Older Australia at a Glance* publication.

In the wider population risk factors such as smoking remain, while others, such as obesity and insufficient physical activity, have gained prominence. And the health of particular sections of the population, notably Aboriginal and Torres Strait Islander peoples, has not improved.

Australia's Health 2004 not only describes all these separate issues, but attempts to bring them into a whole, to put them in a broader context.

As ever, this 2004 edition of *Australia's Health* is the product of hard work across the AIHW, and of many colleagues from outside the Institute. My sincere thanks go to all involved. Dr Ching Choi, who led the author team, and Dr Paul Magnus, editor of *Australia's Health 2004*, deserve special recognition.

Richard Madden

Director

Overview—*Australia's Health 2004*

Introduction

Over its 16-year history *Australia's Health* has been the nation's premier health 'report card'. For 2004 the verdict is 'very good' to 'very good plus', with continuing improvements in life expectancy, falls in the prevalence of many diseases and health conditions, and improved survival from them. Health services continue to be of high quality, and are widely available and accessible.

While all health improvements are welcome, there is still much to be done. Diabetes prevalence has risen, as have levels of obesity and insufficient physical activity. Smoking rates continue to be a public health challenge. There is still no evidence of overall improvement in the health of Aboriginal and Torres Strait Islander peoples.

This overview presents selected findings from the body of the report, and some health-related comparisons between Australia and similar countries. Please use the index at the back of the report to find pages containing more detailed information on topics of interest.

Life expectancy

- Australians continue to live longer and can now expect to live for an average 80 years. For females, life expectancy at birth in 2002 was 82.6 years and for males it was 77.4.
- Australia's life expectancy is among the best in the world, ranking 4th for males and females in 2002.
- Life expectancy for Aboriginal and Torres Strait Islander peoples, however, is about 20 years lower than for other Australians.
- Overseas-born Australians have lower overall death rates than other Australians.
- Infant mortality rates in Australia have halved in the last 25 years, but half of the OECD countries have better rates. Babies of Indigenous mothers remain more than twice as likely to die in their first year as babies born to other Australian mothers.

Ill health

The major burden of disease in Australia arises from long-term conditions such as cardiovascular diseases, cancers, mental illness and nervous system disorders. There is a much smaller contribution nowadays from infectious diseases.

- Cardiovascular disease is still the leading cause of death for both males and females despite a marked drop in death rates since the late 1960s.
- About one in five Australians had cardiovascular problems in 2001 and around 1.1 million have a disability as a result.
- Cancer ranks second as an overall cause of death, and its overall death rates fell between 1992 and 2002, but it now kills more middle-aged Australians than cardiovascular disease.

- Lung cancer caused most cancer deaths (7,303) in Australia in 2002, ranking first in males (4,760) and a close second to breast cancer in females (2,543 lung and 2,698 breast).
- Injury death rates have fallen markedly over the past several decades—but injury is still the leading cause of death for people under the age of 45.
- Suicide death rates have gradually decreased over recent years. The rate for 15–24-year-old males in 2002 was the lowest since 1984.
- Around 800,000 Australians are estimated to have a psychiatric condition causing disability.
- Dementia—including Alzheimer's disease—affected an estimated 97,800 Australians aged 65 years or more in 1998. Over 95% of the associated disability was at a severe or profound level.
- Diabetes prevalence has more than doubled over the past two decades and is estimated to affect around one million Australian adults.
- Self-reported diabetes among Indigenous Australians in 2001 was almost four times as high as for other Australians.
- Recent surveys show that asthma affects 14–16% of children and 10–12% of adults. Children have much higher rates of hospitalisation for asthma than adults.
- There was an increase in the proportion of children with asthma in the 1980s and early 1990s, but no further increase since that time. There has been little change in the prevalence of asthma among adults over the past 20 years.
- Death rates for chronic obstructive pulmonary disease (COPD) have declined for males over the last three decades, but increased for females up to 1990 and have remained steady since.
- Arthritis and other musculoskeletal conditions are estimated to affect more than 6 million Australians (3 in every 10) in 2001.
- Arthritis and other musculoskeletal conditions cause more disability than any other medical condition, affecting about 34% of all people with a disability.
- Kidney failure caused over 1,900 deaths in 2002 and hospital care involving kidney dialysis was a leading reason for admission in 2001–02.
- The loss of all natural teeth has become half as common over the last three decades and now affects less than one-tenth of the adult population, but a larger proportion of those aged 65 years and over.
- Around 13,000 people were living with HIV/AIDS in Australia in 2002, with the number of new cases of AIDS now relatively stable at 200–250 each year.

- An estimated 225,000 Australians were living with hepatitis C in 2002, with around 16,000 notifications of newly acquired infection in that year.

- Two infectious diseases of global significance emerged early in 2003—severe acute respiratory syndrome (SARS) and avian influenza subtype H_5N_1 ('bird flu')—but as at April 2004 only one SARS case (from overseas and during the 2003 outbreak) had been identified in Australia and none of bird flu.

Health risks

- In 1999–2000, one in two Australian adults (over 6 million people) had blood cholesterol levels regarded as high (5.5 mmol/L or more).

- Over the last two decades the prevalence of high blood pressure among 25–64-year-old men and women has more than halved, but in 1999–2000 it affected around three in 10 or 3.7 million Australians over the age of 25 years.

- Obesity prevalence among adults aged 25–64 years has doubled over the last two decades, and about one in five are now obese.

- Almost a quarter (23%) of women from the most disadvantaged fifth of the population were obese in 2001, nearly double the rate of the most advantaged fifth (12%). For men the corresponding rates were 19% and 13%.

- One in five adults smoked daily in 2001, compared with 70% of men and 30% of women smoking in the 1950s.

- Recent data suggest that teenage smoking rates are declining or at least stable, but about one in eight young people aged 14–17 years smoked daily in 2001, 13% of the females and 10% of the males.

- Four in five Australians aged 14 years and over consumed alcohol in 2001, with about one in 10 doing so daily. These rates have been fairly stable for a decade.

- The vast majority of drinkers consumed alcohol at levels that posed only a low risk of harm to health, although one in 10 drank at levels that risked harm in both the short and long term.

- About one in six Australians aged 14 years and over in 2001 reported using an illicit drug during the previous 12 months, with one in eight using cannabis. There is no clear trend in overall illicit drug use since 1991.

- In 2000 more than one in two Australian adults did not undertake leisure-time physical activity at levels recommended for health benefits, including almost one in six who reported no leisure-time physical activity at all.

- Between 1997 and early-to-mid 2002 there was a marked improvement in child vaccination rates, but coverage was a little below the over-90% target for 2-year-olds and, at 81% for 6-year-olds, markedly under the target of near-universal coverage for children at school entry.

Health resources

- Health expenditure in Australia represented 9.3% of GDP in 2001–02, compared with 8.7% in 1998–99 and 8.1% in the early 1990s.
- In 2001–02, $66.6 billion was spent on health services in Australia. About 69% was funded by governments—46% by the Australian Government, and 23% by state, territory and local governments.
- Health expenditure classified by disease or injury group was highest for cardiovascular diseases, at an estimated $5.4 billion in 2000–01 (or 11% of total allocated health expenditure). Nervous system disorders (including dementia) were next at $4.9 billion, followed by musculoskeletal conditions ($4.7 billion), injuries ($4.1 billion), respiratory diseases ($3.5 billion), oral health ($3.4 billion), and mental disorders at $3.0 billion.
- Spending on health by Australians from their own pockets has grown at a greater rate (7.7%) than funding by governments (5.7%) over the period 1997–98 to 2001–02.
- In 2000-01, the rate of health expenditure for people aged 65 years and over was three times that for the population as a whole.
- Expenditure on pharmaceuticals grew, in real terms, at an average of 11.9% per year between 1997–98 and 2001–02.
- In 2001 there were approximately 557,800 workers in the health services industry in Australia; 356,100 worked in health occupations, with 201,700 in other occupations.
- In Australia in 2001 there were about 51,800 medical practitioners, 244,500 nurses, 25,900 dental workers and 13,900 pharmacists. Overall, there were 2,322 health workers for every 100,000 people in 2001, up from 2,206 in 1996.
- Australia's medical workforce increased by just over 12% between 1996 and 2001, but because doctors are working fewer hours the overall doctor supply remained steady at 357 full-time equivalent (FTE) practitioners per 100,000 population.
- The nursing supply in Australia was 1,024 FTE nurses per 100,000 population in 2001, unchanged from 1999 but down on the 1995 figure of 1,127 FTE nurses per 100,000 population.
- There was decreasing supply of health employees with increasing remoteness in 2001. For example, there were 1,147 people per 100,000 population employed in hospitals in major cities, and 601 per 100,000 population in very remote areas.
- The health workforce is ageing, with about 39% of health employees now aged 45 years or more. The female nursing workforce in particular has aged rapidly, with 42% aged 45 years or more in 2001.
- Nearly half of all doctors reported working 49 or more hours per week, higher than any other broad health occupational group.

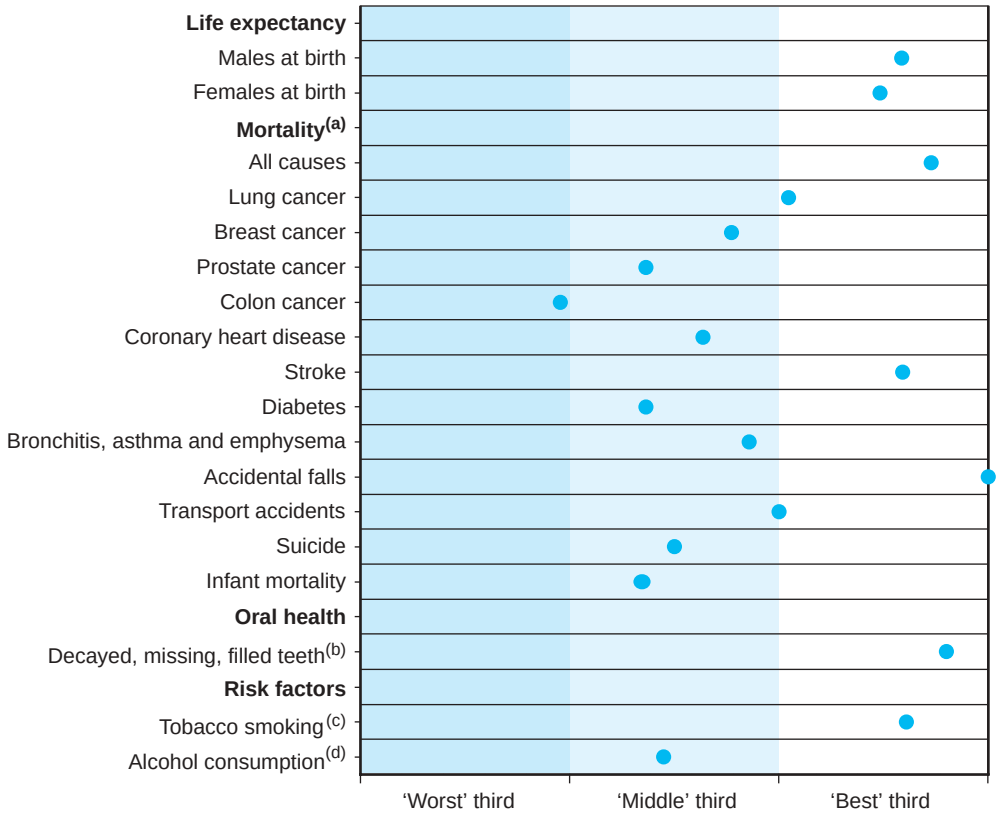
Health services

- There were 6.4 million admissions to public and private hospitals in 2001–02. Admission rates for private hospitals rose by 35.7% between 1997–98 and 2001–02, and by 5.2% for public acute hospitals.
- There has been a shift in hospital use from the public to the private sector. From 1997–98 to 2001–02 the proportion of admissions that were in public acute hospitals fell from 67.4% to 61.7%.
- There was a clear upward trend in the proportion of hospital admissions that were day-only, from 46.3% in 1997–98 to 52.3% in 2001–02.
- Overall, the median waiting time for elective surgery in public hospitals was 27 days in 2001–02, but around 5% waited for more than 12 months.
- The proportion of public hospital emergency department patients that received care as urgently as needed varied from 99% for resuscitation patients to 59% for semi-urgent patients.
- Medicare provided benefits for 221.4 million items in 2002–03, 0.3% more than in 2001–02. Unreferred attendances (mainly with GPs) comprised 43.8% of the items and pathology testing comprised 31.8%.
- In 2002–03, 158.5 million community prescriptions were filled under the Pharmaceutical Benefits Scheme, 2.6% more than the 154.5 million in 2001–02. The medications most commonly provided were atorvastatin and simvastatin, used for lowering blood cholesterol.
- In 2002–03 GPs wrote about 9 million fewer prescriptions than they did five years earlier, mainly due to reduced prescribing of antibiotics for respiratory infections.
- The proportion of women of the target age (20–69 years) who were screened under the National Cervical Cancer Screening Program was 61% over the 1996–1997 two-year period, 63% in 1998–1999, and 61% in 2001–2002.
- The proportion of women of the target age (50–69 years) who were screened for breast cancer under the BreastScreen Australia programme was 52% over the 1996–1997 two-year period, 56% in 1998–1999, and 57% in 2001–2002.

How Australia compares

The figure below shows broadly how Australia ranks on various aspects of health among the 30 member countries of the Organisation for Economic Co-operation and Development (OECD). Comparisons are made where recent data are available for a substantial number of the countries (on average 24 countries for each indicator), but data may not relate to the same year for each country.

For the items listed, Australia generally compares well, ranking in the best or middle one-third in most cases. However, for deaths from colon cancer, prostate cancer and diabetes, and for infant mortality, our performance ranks in or towards the bottom one-third of the countries compared.



(a) Age-standardised to the 1980 total OECD population.

(b) Average number for 12-year-olds.

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

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

Source: OECD Health Data 2003.

Figure 1: Selected health indicators, Australia's ranking among OECD countries

1 Introduction

Australians are generally healthy, and Australia's health and wellbeing is likely to improve. Individuals are gaining a better understanding of their own health and how to maintain it; the science and practice of prevention and treatment is continually advancing; and most Australians have very good access to health services.

Over the course of the previous century the nature of illness and disability dramatically shifted away from infectious diseases to chronic conditions, especially those influenced by lifestyle and behaviour. Some of these lifestyle factors remain of concern: overweight and obesity is endemic in Australia, not enough people have sufficient physical activity, and around one-fifth of the adult population smoke tobacco.

This report—the ninth in the series of biennial reports on health in Australia produced by the Australian Institute of Health and Welfare (AIHW)—is a compilation of key health statistics and analysis primarily based on the work of the AIHW. Many of the topics presented in the report are treated more fully in separate AIHW publications, all of which are available at no cost on the AIHW website <www.aihw.gov.au>. Also available on the website are interactive databases containing data on hospital episodes, cancer incidence, general practice encounters, alcohol and other drug treatment services, health and welfare services expenditure, and disability services.

This first chapter discusses what health is, some issues in improving it, and the role of health information in supporting the needs of the many participants in the Australian health system. It also includes a snapshot of Australia (see Box 1.1), an overview of the Australian health system, and a brief outline of the other chapters.

Box 1.1: Australia at a glance

- *Population of 20 million, including about 460,000 Indigenous Australians (2% of total)*
- *Average life expectancy at birth is 82.6 years for females, 77.4 for males*
- *Fertility rate (1.75 births per woman) is below replacement level; middle-ranked among developed countries*
- *Climate varied but mainly dry; high exposure to solar radiation*
- *Highly urbanised; most people live in south-east seaboard region*
- *Many cultural backgrounds; 22% of residents born overseas*
- *77% of 15–19-year-olds are at school or other educational institution*
- *Per person gross domestic product (GDP) 12th among 30 OECD countries*
- *Services sector main contributor to GDP (61%)*
- *Unemployment under 6% in early 2004*
- *Health expenditure 9.3% of GDP in 2001–02*

1.1 Understanding health

What is health?

Health should be viewed broadly. Almost sixty years ago the World Health Organization (WHO) described health as 'a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity' (WHO 1946). A recent dictionary definition is 'the general condition of the body or mind with reference to soundness and vigour' (*The Macquarie Dictionary (revised 3rd edition)* 2003).

Despite WHO's wide and longstanding definition, for many years the dominant statistics have been mainly about ill health. For example, the International Classification of Diseases (now in its tenth revision and known as the ICD-10) aims to specify the full range of diseases and injuries classified according to causes, body site and other features. Most of the other measures also relate to ill health and it remains difficult to do justice to the WHO's ideal. However, in recent decades efforts have greatly expanded to include measures such as health determinants (factors influencing health), self-rated health status and a person's level of functioning.

The WHO's recently released International Classification of Functioning, Disability and Health (ICF) has added much impetus to pursuing this broader approach (WHO 2001). It complements the ICD by providing additional perspectives of good and bad health in a social context. Functioning and disability are viewed as multi-dimensional concepts relating to:

- body structure and function;
- activities (such as mobility and communication) and participation in life situations (such as involvement in social interaction and work); and
- the physical and social environment that may help or hinder how people live.

The ICF framework also acknowledges the importance of personal factors that can affect an individual's health.

This approach makes it clear that health is an important part of individual and social wellbeing and that there are degrees of good health as well as degrees of bad health (represented by the functioning and disability ends of the health continuum, respectively). Healthy people feel and function well in body and mind, and are in a condition to do so for as long as possible.

A conceptual framework

Australia's Health is based on the conceptual framework presented in Figure 1.1. It shows that Australia's levels of health and wellbeing, including diseases and disability, are influenced to varying degrees by a range of determinants that are in complex interplay. These determinants can be socioeconomic, environmental, behavioural (such as alcohol use or physical activity), biomedical (such as blood cholesterol or blood pressure) or genetic factors.

These causes and their effects on health and wellbeing can be modified to various degrees by prevention and health promotion, treatment, rehabilitation and other health

care. Such interventions are supported by human and material resources and associated systems, including essential information via research, monitoring and evaluation.

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

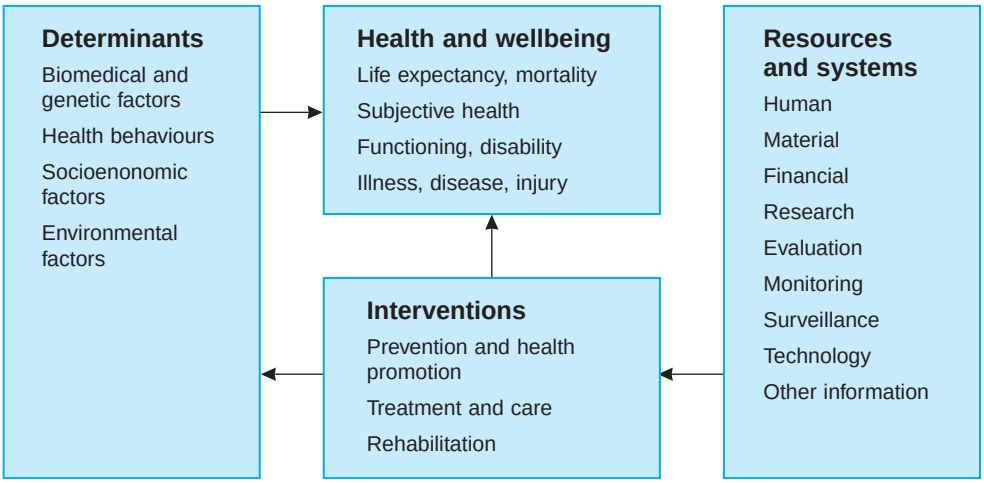


Figure 1.1: Conceptual framework for *Australia's Health*

Improving health

Many things influence health—as further described in Chapter 3—including preventive and treatment interventions. Having a country that is socially and economically 'healthy' is arguably the most important factor in ensuring a good average level of health in the population. These general influences in turn affect other major factors that interact and lead to differences among individuals in their health—such as their educational and income levels, their choices about healthy living, and so forth.

Action on broad social determinants can therefore be seen as the widest and most far-reaching form of 'health intervention'. Such action is among the great aims of society for reasons that include health, in its narrower sense, but go well beyond it. It follows that this involves much more than the health system. However, that system can do much in its own right and at many levels. Its activities range from clinical and preventive services and programs through to efforts to help improve the physical, social and economic environment for groups or individuals at special risk. As well as seeking to reduce people's exposure to risks, some health strategies aim to help individuals develop personal skills to exercise more control over their own environments and to make healthy choices. Other strategies may have a broader aim, such as enhancing a community's capacity to provide culturally relevant services.

The effectiveness of the health system in achieving its goals is ultimately a function of its performance as a system. The National Health Performance Framework offers a structure for considering system performance (NHPC 2001), and its components include the:

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

Given the great range of influences on health, many major improvements require a strong partnership among components of the system—such as public health and clinical care—and require that the health sector works with other sectors to make the best use of available resources. It also requires partnerships between the health system and others involved in the life of individuals using the system, such as family and friends, teachers, employers and so on.

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

1.2 The role of health information

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

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

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

Increasing attention is being given to organising health information to support decision making. The National Health Information Agreement—originally made in 1993—covers Australian Government, state and territory health agencies, the Australian Bureau of Statistics, the AIHW, and the Health Insurance Commission. A major product of this agreement is the *National Health Data Dictionary*, which is updated annually to provide standards for national health information and generally to be a guide for gathering health data.

With the rapidly increasing uptake of electronic health information systems, along with community concern about personal privacy, a key challenge for the health information system is implementing a secure, effective electronic health record that will lead to better health.

An important component of health information is the application of research findings to improve health. Not surprisingly, health research is one of the Australian Government's four National Research Priorities (see Box 1.2).

Box 1.2: National Research Priority: promoting and maintaining good health

The following goals are set under this National Research Priority:

1. A healthy start to life: *counteracting the impact of genetic, social and environmental factors which predispose infants and children to ill health and reduce their wellbeing and life potential.*
2. Ageing well, ageing productively: *developing better social, medical and population health strategies to improve the mental and physical capacities of ageing people.*
3. Preventive healthcare: *new ethical, evidence-based strategies to promote health and prevent disease through the adoption of healthier lifestyles and diet, and the development of health-promoting products.*
4. Strengthening Australia's social and economic fabric: *understanding and strengthening key elements of Australia's social and economic fabric to help families and individuals live healthy, productive and fulfilling lives.*

Source: DEST 2003.

1.3 The Australian health system

The Australian health system is world-class in both its effectiveness and efficiency: Australia consistently ranks in the best performing group of countries for healthy life expectancy and health expenditure per person (WHO 2003).

These achievements are largely the result of partnerships between individual Australians and families and health care professionals. People's decisions about lifestyle, self-care, and seeking and acting on professional help, and their participation in the development of public policy at many levels, all contribute to shaping the Australian health system. Increasingly, individuals are using information from sources such as the World Wide Web to actively manage their health in partnership with health care providers.

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

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

- National Health Priority Action Council, which aims to drive improvements in priority health areas;
- Australian Council for Safety and Quality in Health Care, which leads national efforts to improve the safety and quality of health care, with a particular focus on minimising the likelihood and effects of error;
- National Public Health Partnership, which plans and coordinates national public health activities;
- National Health Information Group, which coordinates and directs the implementation of the National Health Information Agreement.

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

Between them, these arrangements aim to give all Australians—regardless of their personal circumstances—access to adequate health care at an affordable cost or no cost. Safety nets apply for Medicare and the PBS to protect Australians from high out-of-pocket costs for medical services and pharmaceuticals provided outside of hospitals. These two schemes are further integrated with social welfare arrangements, with larger rebates and/or lower safety net thresholds provided for individuals or families who receive certain income support payments (such as for unemployment or disability). There are also special health care arrangements for members of the defence forces, and for war veterans and their dependants.

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

Patients can access public hospitals through emergency departments, where they may present on their own initiative, via the ambulance services, or after referral from a medical practitioner. Public hospital emergency and outpatient services are provided free of charge.

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

Patients treated in a private hospital—or as a private patient in a public hospital—can select their treating specialist, but charges then apply for all of the hospital's services (such as accommodation and surgical supplies). Medicare subsidises the fees charged by doctors, and private health insurance funds contribute towards medical fees and the hospital costs for insured patients. 'No-gap' or 'known-gap' arrangements are increasingly being agreed on between hospitals and insurers.

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

Several state and territory governments have established 24-hour telephone-based health advice services in recent years. These are staffed by health professionals who answer queries from callers about health problems, assisted by specialised reference software. The Health First service in the Australian Capital Territory, for example, took almost 13,000 calls in the fourth quarter of 2003.

Many Australians purchase private health insurance, with around 49% of the population covered for hospital and/or ancillary benefits in early 2004. Unlike other countries, such as the United States of America and Germany, there are virtually no employer-based health insurance schemes in Australia. In response to a significant decline in health insurance membership towards the end of the last century, the Australian Government introduced various incentives to encourage uptake and retention of private health insurance—notably a 30% rebate on membership fees and Lifetime Health Cover. Lifetime Health Cover recognises the length of time a person has had hospital cover, such that people who take out hospital cover before the age of 30, and maintain their hospital cover, will pay lower premiums throughout their life compared to someone who joins when they're older.

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

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

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

Essential support to the health service system is given by many other agencies. Research and statistical agencies provide the information needed for prevention, detection, diagnosis, treatment, care and associated policy. Consumer and advocacy groups contribute to public discussion and policy. Professional associations for health practitioners set professional standards and clinical guidelines. Universities and hospitals undertake training of undergraduate and postgraduate health professionals. Voluntary agencies contribute in various ways, including raising funds for research, running educational and health promotion programs, and coordinating voluntary care.

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

1.4 Structure of the report

The report is broadly structured along the lines of the conceptual framework shown in Figure 1.1.

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

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

Chapter 4 describes the health of particular population groups and shows that some, especially Aboriginal and Torres Strait Islander peoples, do not share in Australia's generally good health.

Chapter 5 examines health system funding and expenditure, and employment in the health industry.

Chapter 6 presents extensive information on the Australia's health services and their use, covering hospitals, doctors and other health professionals, and public health services.

Chapter 7 outlines key structures and processes involved in producing health statistics for a better understanding of current and emerging health issues, and poses challenges for the health information system.

Chapter 8 examines the health of older Australians, focusing on the age groups 65–74 years, 75–84 years, and 85 years and over. It provides details on demographic trends, health conditions and disability among these older Australians.

After Chapter 8 the Appendix summarises information on the National Health Priority Areas. This is followed by statistical tables covering a range of topics. These tables contain data on population and fertility as well as health-related information. They include time series information and comparisons with other countries.

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2 Health of Australians

Chapter 2 provides a picture of the health of Australians, both their wellbeing and their ill health. It also provides profiles of major diseases and conditions, and their effects in Australia.

The chapter focuses on the health of the Australian population as a whole. International comparisons show that Australians enjoy good health and that their trends are broadly in step with improvements occurring in other developed countries. However, differences in the health of population groups persist within Australia.

The chapter is organised into seven major sections:

2.1 Aspects of health: focuses on variations in health in general terms, such as life expectancy and oral health. It also describes some health conditions that do not rank highly in terms of morbidity and mortality but still affect quality of life.

2.2 Functioning and disability: describes the concepts of functioning, activity limitation and disability, as outlined by the International Classification of Functioning, Disability and Health (ICF) framework. Some relevant Australian data are provided.

2.3 Morbidity and illness: outlines the extent of morbidity, illness and pain associated with various diseases and conditions, using measures of both disease prevalence and perception of illness and pain.

2.4 Injuries: describes how accidents and injuries have an increasing share of the ever-diminishing mortality in the early and middle years of life. It also reviews morbidity associated with injuries and poisoning.

2.5 Mortality: uses death statistics, covering the cause of death, death rates and trends in mortality, to describe the health status of the population and how it is changing.

2.6 Non-communicable diseases: focuses on chronic diseases, that is, those that persist for a long time. The section also includes profiles of National Health Priority Areas diseases and conditions.

2.7 Communicable diseases: provides statistics on levels of infectious diseases, and describes the morbidity and mortality associated with them.

This chapter should be read in conjunction with other chapters, in particular Chapters 3 and 4. Information on health risk factors relevant to various diseases and conditions covered in this chapter is in Chapter 3, whereas information on the health of defined population groups is given in Chapter 4. Information on health service and resource use, covered in Chapters 5 and 6, also sheds some light on the extent of disease in Australia.

2.1 Aspects of health

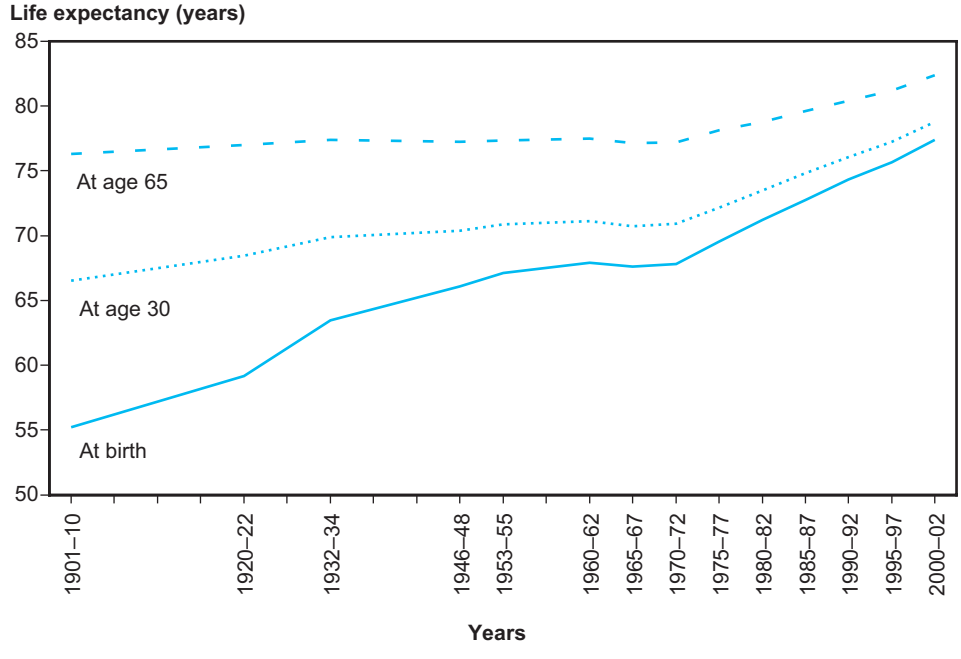
As mentioned in Chapter 1, most data on health tend to be about ill health. 'Positive' health is more difficult to measure, but doing so remains a desirable goal. Another aspect that merits more attention is that of symptoms, rather than diseases. Frequent complaints, such as headaches, rashes and troubles with teeth, are often seen as minor and not recognised or accepted as ill health. However, these complaints are common enough to take a considerable toll on populations and individuals.

This section provides brief overviews on six different aspects of health in Australia.

Life expectancy

In 2000–02, life expectancy in Australia at birth was 77.4 years for males and 82.6 years for females; hence people's life expectancy is now 80 years. In contrast, a male could expect to live 55.2 years and a female 58.8 years in the 1901–10 period. This is an increase of about 22 years (40%) for males and 24 years (41%) for females over the last century (Figures 2.1 and 2.2).

The difference in male and female life expectancies also increased during this period, from 3.6 years higher for females in the 1901–10 period to 7.1 years in 1980–82. However, since then the gap has declined steadily to 5.2 years in 2000–02.

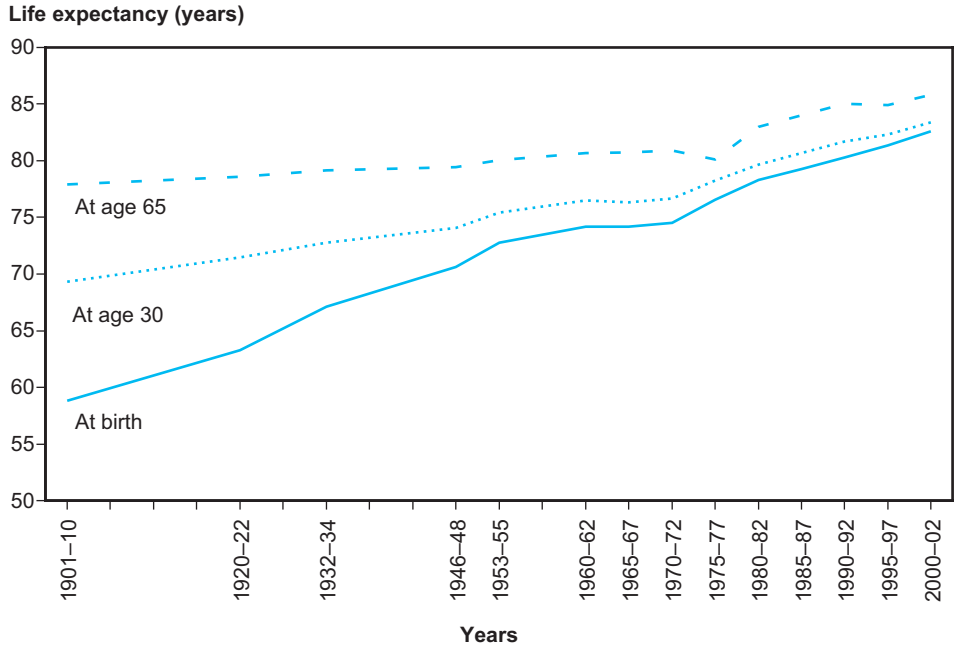


Sources: Australian Government Actuary Life Tables, various years; ABS 2003a.

Figure 2.1: Trends in life expectancy, males, 1901–10 to 2000–02

Reductions in infant and child mortality have been the greatest contributors to this improvement. Significant gains also occurred through reductions in death rates among the middle-aged and the elderly, especially for cardiovascular diseases (heart disease and stroke), over the past several decades. Males aged 30 in 2000–02 could expect to live to 78.8 years and females to 83.4 years; this is about 13 years more than the respective life expectancies in the period 1901–10. Similarly, males aged 65 in 2000–02 could expect to live to 82.4 years and females to 85.8 years, about 7 years more than for those in that age bracket in 1901–10.

These trends have important demographic, health and wellbeing consequences. Not only do they increase the proportion of the population reaching an advanced age, but they also influence health, disease and disability patterns in a population.



Sources: Australian Government Actuary Life Tables, various years; ABS 2003a.

Figure 2.2: Trends in life expectancy, females, 1901–10 to 2000–02

Variation in life expectancy

Life expectancy varies across population groups within Australia. Aboriginal and Torres Strait Islander peoples have a much lower life expectancy than the national average. Life expectancy for Indigenous newborns in 1999–01 was about 20 years less than that for non-Indigenous newborns. For Indigenous persons aged 30–34, life expectancy was about 16 years less than their non-Indigenous counterparts; for those aged 65–69, the difference was 7 to 10 years (ABS 2002a).

The socioeconomically most disadvantaged fifth of males and females were also expected to live about 4 years and 2 years less, respectively, than males and females in the most advantaged fifth in 1998–00 (Draper et al., in press).

Life expectancy also shows geographical variation. Life expectancy at birth in 2000–02 in the Northern Territory was lower by 6.1 and 5.9 years for males and females respectively, compared with the national averages (ABS unpublished). These differences mainly reflect the lower life expectancy of the Indigenous population, which makes up close to 30% of the Northern Territory's population (ABS & AIHW 2003).

International comparisons

Overall, Australians enjoy one of the highest life expectancies in the world (WHO 2004). Table 2.1 compares Australia with a range of other countries (but note that the estimates of Australian life expectancy differ from those provided on the previous page because of slightly different methods used). The Australian male life expectancy in 2002 was close to the highest recorded—in Japan and Iceland (78.4 years) and Sweden (78.1). Similarly, female life expectancy in Australia was not far behind the countries with the highest female life expectancy—Japan (85.2 years) and France (83.5). Life expectancies in Australia were a little higher than in countries such as Canada, New Zealand, Norway and Spain, and higher again than in the United Kingdom and the United States.

Most of the countries compared in Table 2.1 are from the more developed regions of the world. The life expectancies in less developed countries are considerably lower. Regions defined by the United Nations as being made up of less developed countries, that is, countries outside Europe, North America, Australia, Japan and New Zealand, had an overall life expectancy of about 64 years in 2002, compared with 75 years in developed regions. The African continent had the lowest life expectancy at birth (less than 50 years). Life expectancy in the Asian region varied greatly, from 65 years for males and 68 for females in Indonesia to corresponding figures of 70 and 73 for China, and 77 and 82 for Singapore.

Healthy life expectancy

Australians can expect to enjoy good health for about 90% of their life span, with the remaining 10% of their time spent with illness or disability. In terms of health-adjusted life expectancy (HALE), a measure of the expected number of years to be lived without reduced functioning (WHO 2004), Australian males in 2002 could expect to live the equivalent of 70.9 years without reduced functioning and Australian females about 74.3 years. This compared favourably with other countries that have high life expectancies (Table 2.1).

Self-reported health

Self-reported health status is commonly used as an indicator of general health and wellbeing. It refers to physical and mental health as assessed by individuals according to their values and (especially in older Australians) has been found to be a strong indicator of future health care use and mortality (AIHW 1999).

National information on self-reported health status is provided by the Australian Bureau of Statistics' (ABS) surveys, which ask respondents to rate their general health as excellent, very good, good, fair or poor.

Table 2.1: Life expectancy at birth and health-adjusted life expectancy, selected countries, 2002

Males				Females			
Country	Life expectancy (LE) (years)	Health-adjusted life expectancy (HALE) (years)	HALE/ LE (%)	Country	Life expectancy (LE) (years)	Health-adjusted life expectancy (HALE) (years)	HALE/ LE (%)
Japan	78.4	72.3	92.2	Japan	85.2	77.7	91.2
Iceland	78.4	72.1	92.0	France	83.5	74.7	89.5
Sweden	78.1	71.9	92.1	Switzerland	83.4	75.3	90.3
Australia[(a)]	**77.9**	**70.9**	**91.0**	Spain	83.0	75.3	90.7
Switzerland	77.7	71.1	91.5	**Australia**[(a)]	**83.0**	**74.3**	**89.5**
Israel	77.4	70.5	91.1	Sweden	82.7	74.8	90.4
Singapore	77.4	68.8	88.9	Italy	82.5	74.7	90.5
Canada	77.2	70.1	90.8	Canada	82.3	74.0	89.9
Italy	76.7	70.7	92.2	Austria	82.1	73.5	89.5
New Zealand	76.7	69.5	90.6	Iceland	81.8	73.6	90.0
Austria	76.4	69.3	90.7	Norway	81.7	73.6	90.1
Norway	76.3	70.4	92.3	Singapore	81.7	71.3	87.3
Spain	76.1	69.9	91.9	Germany	81.6	74.0	90.7
Netherlands	76.0	69.7	91.7	Finland	81.5	73.5	90.2
Malta	75.9	69.7	91.8	Belgium	81.5	73.3	89.9
France	75.9	69.3	91.3	Israel	81.3	72.3	88.9
Greece	75.8	69.1	91.2	New Zealand	81.2	72.2	88.9
United Kingdom	75.8	69.1	91.2	Netherlands	81.1	72.6	89.5
Germany	75.5	69.6	92.2	Greece	81.0	72.9	90.0
Belgium	75.2	68.9	91.6	United Kingdom	80.5	72.1	89.6
Denmark	74.9	68.6	91.6	Portugal	80.5	71.7	89.1
Finland	74.8	68.7	91.8	Malta	80.3	72.3	90.0
USA	74.6	67.2	90.1	USA	79.8	71.3	89.3
Ireland	74.4	68.1	91.5	Ireland	79.7	71.5	89.7
Portugal	73.6	66.7	90.6	Denmark	79.5	71.1	89.4
Poland	70.6	63.1	89.4	Poland	78.7	68.5	87.0
China	69.6	63.1	90.7	China	72.8	65.2	89.6
Indonesia	64.9	57.4	88.4	Indonesia	68.0	58.9	86.6
South Africa	48.8	43.3	88.7	South Africa	52.6	45.3	86.1

(a) Estimates provided here by the World Health Organization differ from those of the Australian Bureau of Statistics cited in the text.

Source: WHO 2004.

According to the 2001 National Health Survey, the great majority of Australians aged 18 and over considered themselves to be in good health, with 18% rating their health as excellent, 33% as very good, and 30% as good. A further 14% reported fair health but 5% reported poor health. It should be noted that many people likely to have poorer health, such as those in hospitals and institutions and the homeless, were not included in the survey.

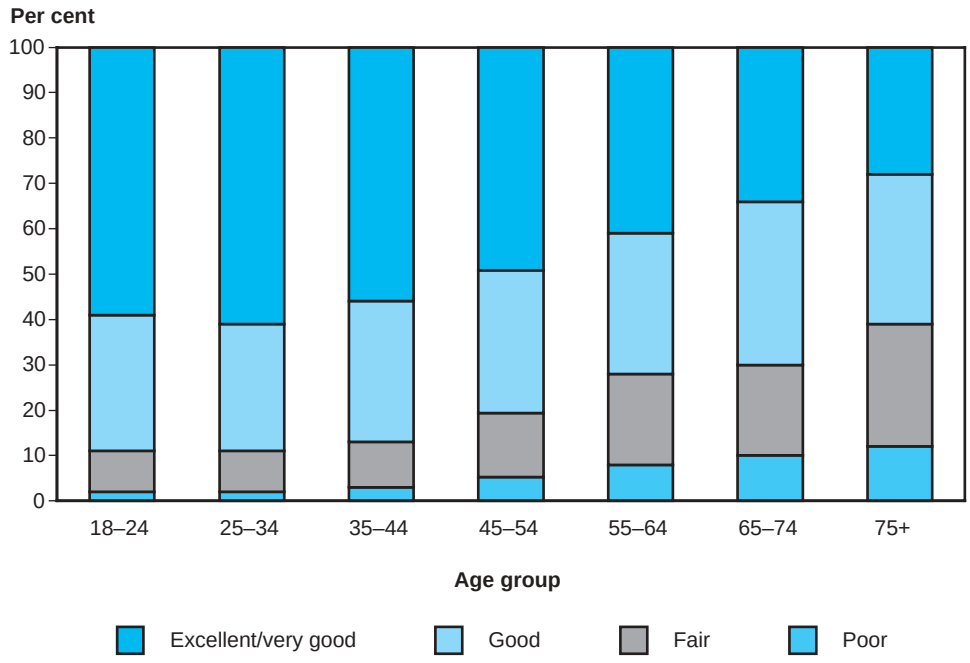
The overall distribution of responses was similar for both males and females (Table 2.2) but differed by age group (Figure 2.3). Health status declined with age, with the proportion of people reporting fair or poor health status increasing in higher age groups.

Table 2.2: Self-reported health status, people aged 18 and over, 1995 and 2001

	Males		Females		Persons	
Rating	**1995**	**2001**	**1995**	**2001**	**1995**	**2001**
Excellent	18.9	17.1	18.6	18.3	18.7	17.7
Very good	35.1	31.8	35.3	33.4	35.2	32.6
Good	28.9	32.3	28.9	29.6	28.9	30.9
Fair	12.8	13.7	13.2	13.9	13.0	13.8
Poor	4.3	5.1	4.0	4.8	4.2	5.0

Note: Rates are age-standardised to the 2001 Australian population.

Source: AIHW analysis of ABS 2001 National Health Survey.



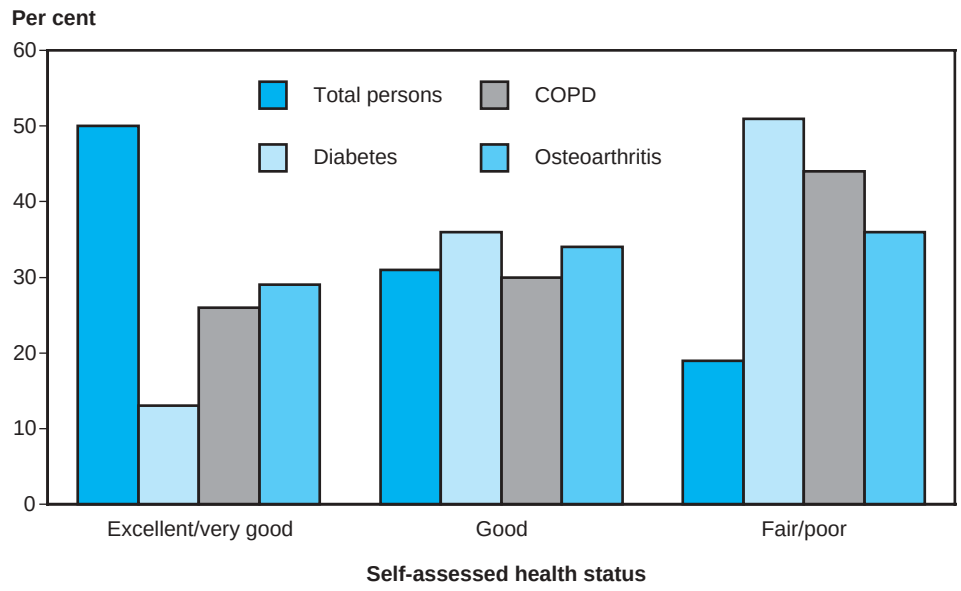
Source: AIHW analysis of ABS 2001 National Health Survey.

Figure 2.3: Self-reported health status, people aged 18 and over by age group, 2001

Nearly two-thirds of Australians reported that their health status was unchanged compared with a year ago, 21% said it had improved, and 13% said it was worse. The pattern was similar for both males and females.

The self-reported health status of the population appeared to decline between 1995 and 2001 (Table 2.2). The proportion reporting their health as excellent or very good declined from 53.9% to 50.3% whereas the proportion reporting their health as fair or poor increased from 17.2% to 18.8%. The changes were similar for both males and females.

People with a long-term illness are much more likely to report their health as fair or poor. For example, those with diabetes, chronic obstructive pulmonary disease (COPD) and osteoarthritis were considerably more likely to report fair or poor health compared with the total population (Figure 2.4). Of those reporting long-term conditions, 21% rated their health as fair or poor in contrast to 4% of those who had reported having no long-term conditions.



Source: AIHW analysis of ABS 2001 National Health Survey.

Figure 2.4: Self-assessed health status, people aged 18 and over by long-term condition, 2001

People with a disability also tend to report lower levels of health than the general population. According to the 1998 Survey of Disability, Ageing and Carers, poor health was reported by 11% of people with a disability and by only 1% of those without disability.

Similarly, the overall health status reported by people with certain risk factors, such as smokers and those who are obese, is poorer than that of the total population (Table 2.3).

Table 2.3: Self-reported health status, people aged 18 and over, by selected risk factor, 2001

	Self-reported health status (per cent)			
Risk factor	Excellent/ very good	Good	Fair/poor	Total
Obese	35.3	36.0	28.7	100.0
Smoker	43.8	34.3	21.9	100.0
All persons	50.2	31.0	18.9	100.0

Note: Rows may not total to 100% due to rounding.

Source: AIHW analysis of ABS 2001 National Health Survey.

Oral health

Oral health is much more than the absence of dental disease. It has a range of dimensions that reflect (among other things) people's comfort, eating, social interaction, self-esteem and satisfaction with their appearance. Therefore no single measure describes oral health comprehensively.

Three different measures help to describe oral health:

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

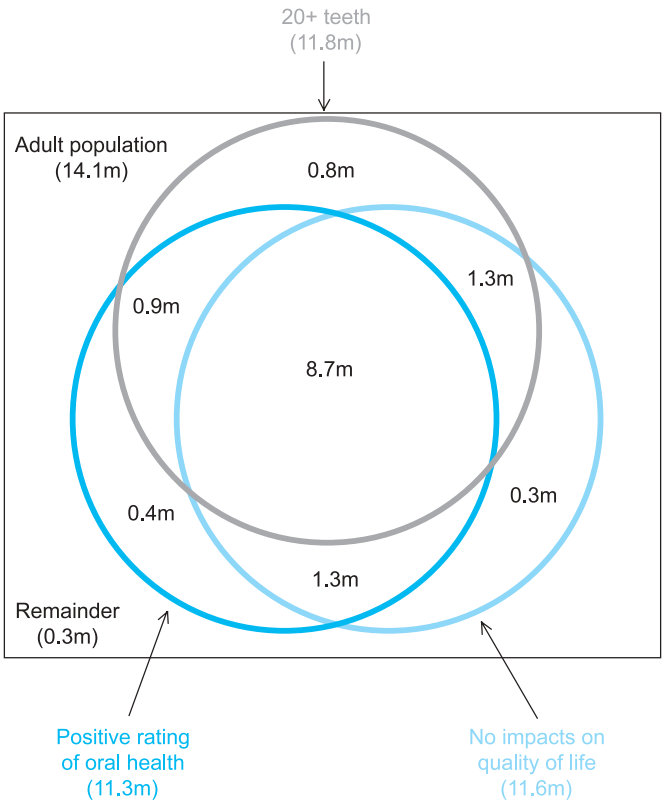
The 2002 National Dental Telephone Interview Survey and a subsequent self-completed questionnaire that was mailed to interviewees provide insights to the oral health of Australians along these three dimensions. According to the survey, at least 84% of people had 20 or more teeth, 80% rated their oral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

However, there was considerable discrepancy between these perceptions in that only 62% of people reported relatively good oral health in all three dimensions. They are represented by the estimated 8.7 million people who overlap on all three circles in Figure 2.5. An estimated 1.3 million adults had 20 or more teeth and experienced no effect on their quality of life, but still rated their oral health only as average, poor or very poor. A further 900,000 had 20 or more teeth and rated their oral health as good, very good or excellent, yet reported experiencing one or more adverse effects on their quality of life. Other examples are depicted in Figure 2.5.

These measures were used to construct a graded scale of four categories of perceived oral health.

- The 'least healthy' end of the scale included the 16% of people who had fewer than 20 natural teeth, regardless of the other two dimensions.
- The second group comprised the 12% of people who had 20 or more teeth but who experienced one or more effects on their quality of life, regardless of their self-rated oral health.

- The third group comprised the 10% of people who had 20 or more teeth and reported no effect on their quality of life, but who rated their oral health only as average, poor or very poor.
- The fourth group was the remaining 62% of people who reported positive oral health in all three dimensions.

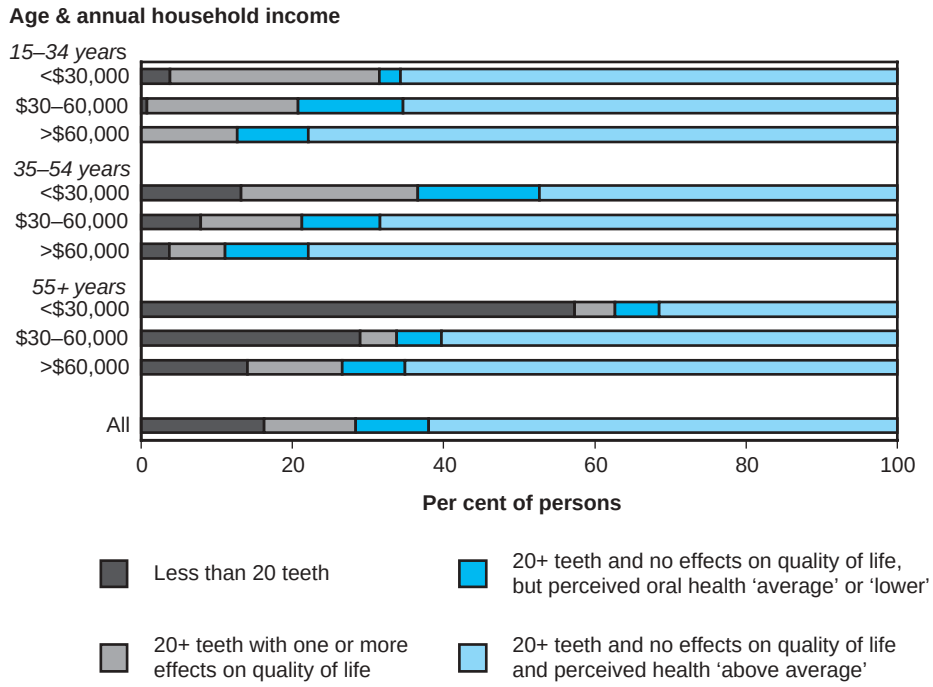


Note: This figure is indicative only, and sectors are not to scale.

Source: 2002 National Dental Telephone Interview Survey.

Figure 2.5: Combinations of three dimensions of oral health, adults, 2002

Figure 2.6 contrasts the distribution of these categories of oral health among groups defined by age and annual household income. Younger people were more likely to report all three positive dimensions of oral health than older people. In addition, positive dimensions of oral health were more likely to be reported by people in high-income households compared with those in low-income households, and this difference is apparent within each age group. Interestingly, the effects of age and income effectively cancelled one another out: among the oldest age group in the highest income category, 65% of people reported all three positive dimensions of oral health, which was virtually identical to the figure for all adults (62%).



Source: 2002 National Dental Telephone Interview Survey.

Figure 2.6: Age and income-related variations in perceptions of oral health, 2002

The survey did not include dental examinations and therefore it is not possible to know whether the people surveyed had clinically defined dental disease or treatment needs. Just as health is more than the absence of disease, some people with relatively positive perceptions of oral health may have dental treatment needs while some people with relatively negative perceptions of their oral health may have no clinical disease.

These results provide several insights into oral health within the Australian population. Given the difficulties in defining 'positive' health, it is not surprising that there was incomplete overlap in the three dimensions of oral health studied (Figure 2.5). In part, this probably reflects individual differences in concepts of health. For example, some people's ratings of oral health may be strongly influenced by their experience of tooth loss whereas others may place greater emphasis on the effects of dental problems on quality of life when making such ratings. To the extent that these three dimensions collectively identify Australian adults who have more positive perceptions about their oral health, the results in Figure 2.6 provide some important public health implications.

More positive perceptions among young people compared with older people could reflect the high levels of dental disease and tooth loss that today's older Australians have had over much of their lives. Yet this is not an inevitable legacy: people in the

oldest age group who were in the highest income category had a profile of positive oral health that was virtually identical to the overall population of Australian adults. And within that overall population, the results indicate that there is potential to improve overall oral health, not only by reducing levels of tooth loss, but by reducing the effect of oral conditions on quality of life.

Sexual health

Sexual health is another major aspect of health. It is affected by, and in turn affects, a broad range of attitudes and social values.

Attitudes to sexuality and reproduction have changed considerably over the past several decades, since the introduction of improved methods of contraception and easy access to them. In addition, various social and economic factors have influenced decisions about marriage and the timing, spacing and number of children.

This section provides an overview of the sexual health of Australians, relating in particular to sexual health practices and associated risk factors, as well as sexual health problems. Section 2.7 on communicable diseases, later in this chapter, provides information on sexually transmitted infections (STIs). Information on other aspects of reproduction are given in Chapter 4 under Section 4.1: Mothers and babies.

The Australian Study of Health and Relationships (ASHR), a national survey carried out in 2001–02 and broadly representative of the population aged 16–59, is an important source of information on the sexual health of Australians. Other sources of information on the subject include the Bettering the Evaluation and Care of Health (BEACH) survey of general practice activity, hospital databases and the National Notifiable Disease Surveillance System (NNDSS).

First intercourse, cohabitation, marriage and fertility

Based on the ASHR, the median age of first intercourse was 16 years. Some 40% of males and one-quarter of females had intercourse before the age of 16.

Australian women are increasingly delaying or avoiding marriage and postponing their childbearing. An indicator of these trends is the median age of first marriage. In 2002, it was 27 years for Australian females and 29 years for Australian males, compared with 22 years and 25 years, respectively, only two decades earlier. Almost three-quarters (73%) of couples now cohabit before marrying (ABS 2003b). Some 30% of all births occur outside marriage, although in most cases the paternity is acknowledged (ABS 2002b). The median age of mothers at the birth of their first child was 30.2 years in 2002, the highest on record.

The birth rate for women aged 20–24 has fallen from 104 per 1,000 in 1982 to 56 per 1,000 in 2002. Those aged 30–34, for the third consecutive year, have the highest fertility at 111 per 1,000. Consequently, the total fertility rate has declined in Australia from around 3.61 births per woman in 1961 to around 1.75 births in 2002 (ABS 2002b). The total fertility rate is notably below the replacement level of 2.1 births, and has been so for the past 25 years.

Around one in five women of reproductive age will remain childless if current fertility patterns persist (Hugo 2002). For many such women, childlessness is a deliberate choice. Others may have fertility problems, either due to natural causes or to problems such as previous pelvic infections. Postponement of childbearing also results in age-related infertility.

Risk of unplanned pregnancies

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

Use of contraception

A variety of contraceptive methods are used for family planning, including non-medical, medical or surgical methods (Table 2.4). In Australia, diaphragms, oral contraceptives, intra-uterine devices, injectables and tubal occlusion devices, as well as post-coital or 'emergency' contraception, require medical prescription or other medical intervention. Tubal ligation or (occasionally) hysterectomy for women and vasectomy for men are the surgical procedures used.

Some 71% of respondents to the ASHR were using some form of contraception (Smith et al. 2003a). Sterilisation (male or female) was the most common method, with oral contraceptives and/or the condom also widely used.

Table 2.4: Methods of contraception currently used by women, 2001–02

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

Note: Column sums to more than 100% because women could report use of more than one method.

Source: Richters et al. 2003a.

Contraceptive use at the time of first intercourse has increased from less than 30% in the 1950s to over 90% in the 2000s. Much of this increase is due to an increase in condom use, as 79.4% of males and 76.2% of females who first had intercourse in the 2000s reported using condoms (Rissel et al. 2003).

In addition to the methods reported in Table 2.4, approximately one in five female respondents to the ASHR said they had used emergency contraception. More than a quarter of those aged 16–19 and two-fifths of those aged 20–29 had used this method. Among users of emergency contraception, 53.3% had used it once, 24.8% twice, and 20.6% three or more times (Smith et al. 2003b).

Pregnancy termination

National information on pregnancy termination is poor, although it has been estimated that one in five pregnancies is terminated (Hugo 2002). Only South Australia, the Northern Territory and Western Australia collect population-based data on induced abortions, and only South Australia publishes these numbers. The number of terminations notified in South Australia in 2002 was 5,417, a rate of 17.2 terminations per 1,000 females aged 15–44 (Pregnancy Outcomes Unit 2003).

In 2002–03, Medicare fee-for-service benefits were paid for 73,927 terminations of pregnancy nationally, but this figure excludes services to public patients in hospital and through other publicly funded programs (Department of Health and Ageing, personal communication).

The proportion of ASHR female respondents who became pregnant as a teenager varies from 22.8% among those now aged 50–59 to 16.9% among those now aged 20–29. Three-quarters (76.1%) of all female respondents had been pregnant at least once, and 22.6% of this group reported having had one or more terminations. The number of terminations ranged from 1 to 12, with 75.7% reporting one, 18.9% reporting two, and only 5.4% reporting three or more terminations (Smith et al. 2003b).

Health of reproductive organs and pregnancy

Limited information is available on the health of reproductive organs and services used in this regard. A composite profile, based on information from the BEACH survey of general practice, hospital separations and the ASHR, is provided below.

Health service use

Female genital system problems, according to the BEACH survey, accounted for 4.6% of the total number of health problems managed by general practitioners (GPs) in 2002–03 (AIHW: Britt et al. 2003). Almost half of these visits were for genital check-ups or Pap smears (27%) or for menopausal problems (22%). A further 11% of these consultations involved menstrual problems. Pregnancy and family planning were the subject of 2.9% of these consultations. Male genital problems accounted for 1% of all health problems managed by GPs.

Statistics on hospital separations (Table 2.5) provide additional information on the extent of morbidity related to reproductive organs as well as complications of pregnancy.

In 2002–03, Medicare fee-for-service benefits were paid for 6,076 tubal ligations and 26,978 vasectomies (Department of Health and Ageing, personal communication). These figures exclude services provided to public patients in hospitals and through other publicly funded programs.

Table 2.5: Hospital separations for diseases of the sex organs and pregnancy-related disorders, 2001–02

Principal diagnosis	Number of separations		Proportion of total separations (per cent)	
	Males	Females	Males	Females
Diseases of the male genital organs	43,987	. .	1.5	. .
Diseases of the breast	2,000	12,078	0.1	0.4
Diseases of the female pelvic organs and genital tract	. .	160,762	. .	4.7
Complications relating to pregnancy	. .	50,092	. .	1.5
Complications relating to labour/delivery	. .	262,516	. .	7.7
Complications relating to the puerperium	. .	32,526	. .	1.0
Pregnancy with abortive outcome	. .	79,717	. .	2.3

. . Not applicable.

Source: AIHW National Hospital Morbidity Database.

Sexual difficulties

Almost one-fifth of male ASHR respondents aged 50–59, and one-eighth of those aged 40–49, reported trouble keeping an erection during at least a month in the past year (Richters et al. 2003b). However, only 5.2% of those aged 50–59 and 1.4% of those aged 40–49 had used treatment to aid erections.

Reports of trouble with vaginal dryness ranged from 7% among females aged 16–19 to more than one-third of those aged 50–59. Pain during intercourse declined from 25% of females aged 16–19 to 15.2% among those aged 50–59.

Other sexual difficulties experienced for more than one month included lack of interest in sex or not finding sexual intercourse pleasurable, premature or non-orgasm, and lack of confidence in sexual performance or bodily attractiveness.

Use of other services

Family planning organisations provide services to promote the sexual and reproductive health of Australians, particularly for those unable to or who prefer not to access such services through GPs. The services include contraception, counselling and information, and the management of sexual and reproductive health. Other services (largely in urban areas) include clinics and community education programs (undertaken both directly and through the training and resourcing of teachers and community workers), and education and training of GPs and nurses.

Sexual Health and Family Planning Australia, which collects data on all state and territory family planning organisations except South Australia, reported 129,102 client visits in 2002–03, a slight increase from 126,720 in 2000–01 (SH&FPA 2003). Early intervention services—Pap smears, pregnancy, rubella and hepatitis checks or STI investigations—represented almost 49% of the total service provision; reproductive and sexual health management accounted for 29% of these services; and contraception for 22%. South Australia's family planning organisation, called SHine, provided over 16,900 clinical services to 5,068 individuals during 2002–03 (SHine 2003). The pattern of services requested was broadly similar to those of other family planning organisations.

Sexually transmissible infections

The incidence and prevalence of sexually transmissible infections (STIs) are important indicators of the variation in the nature and degree of sexual activity within the population. Unlike other infections, only sexually active individuals can be infected with an STI by their contacts. Contacts may have no symptoms but still be infectious at the time of the activity. Since most of the STIs are not immediately life-threatening, those who carry them may continue to contribute to new infections for a long time.

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

In the ASHR, 20.2% of males and 16.9% of females reported that they had been diagnosed with an STI or a bloodborne virus at some stage of their life (Grulich et al. 2003a). The proportions for the 12 months before the survey were 2.0% and 2.2% respectively (Table 2.6). GPs, rather than sexual health clinics, were the most common source of treatment.

Table 2.6: Self-reports of being diagnosed with an STI or bloodborne virus, 2001–02 (per cent)

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

. . Not applicable.

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

Source: Grulich et al. 2003b.

Among those heterosexually active, 42.5% of men and 34.2% of women had used condoms within the year before the survey (de Visser et al. 2003). However, among those who had vaginal intercourse with one or more casual partners over the past six months, only 44.6% of men and 35.4% of women had always used condoms.

Heterosexual couples who used other forms of contraception were significantly less likely to use condoms. Condom use was higher among younger persons and among those with more than one sexual partner. Homosexual males also reported higher condom use (58.9% in the past year). They were also considerably more likely, at 86.8%, to report always using condoms for anal sex with a casual partner.

Information from the NNDSS on STIs is given in Section 2.7 of this chapter. Status reports on HIV/AIDS and hepatitis B and C are also provided in that section.

Vision impairment and eye disorders

Vision impairment and blindness have a large impact on the individuals involved, the workforce and the community. Eye disorders significantly reduce quality of life, increase dependent living and are much more common among those who die prematurely (Taylor 2001).

The leading causes of vision impairment and blindness in Australia are primarily age-related eye disorders (Box 2.1). These include macular degeneration, cataract, glaucoma and diabetic retinopathy. Much refractive error is also age-related but it can be corrected by eyewear and need not result in vision impairment or blindness. Eye disorders have a significant impact on government expenditure. In 2002, for example, Medicare benefits paid about $90 million for eye surgery (HIC 2003).

Box 2.1: Common eye disorders

Refractive error *is a defect of the eye which prevents parallel light rays from being brought to a single focus precisely on the retina, resulting in blurred vision. The four most common refractive errors are myopia (short-sightedness), hyperopia (long-sightedness), astigmatism and presbyopia. Refractive error is correctable with lenses, but uncorrected refractive error can lead to impaired vision or blindness.*

The major causes of vision impairment and blindness include:

Age-related macular degeneration (AMD) *is a condition affecting the central area of the retina (macula) that is responsible for fine central vision. It is highly associated with ageing, but smoking and genetic factors also contribute to its development. While there is no cure, early detection and treatment can reduce further vision loss.*

Cataracts *are cloudy or opaque areas in the lens of the eye. Advancing age, smoking, excess exposure to sunlight and diabetes can increase the risk of cataracts. The condition can be corrected by surgery, which consists of removing the lens of the eye and replacing it with an artificial lens.*

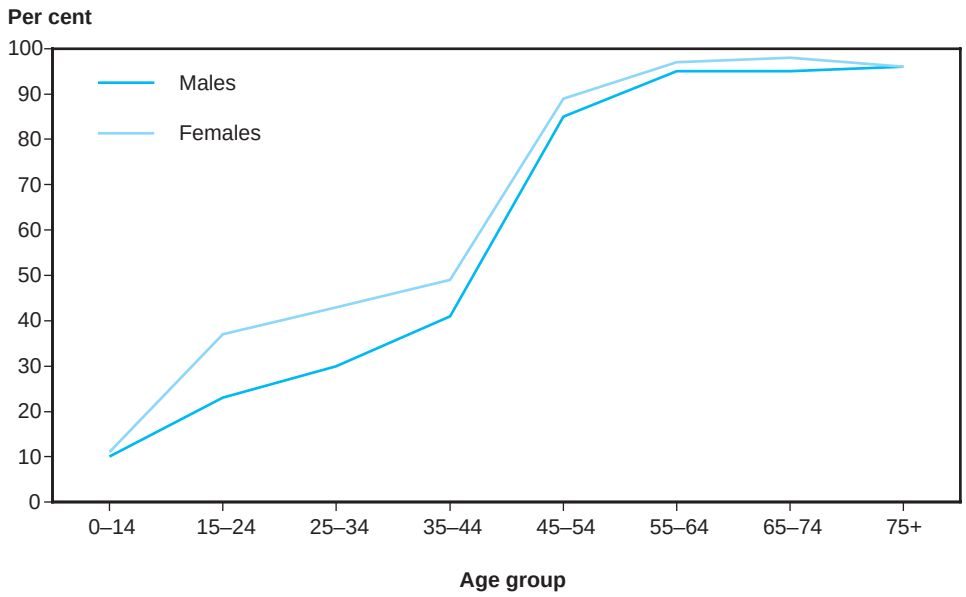
Glaucoma *is a condition of increased fluid pressure inside the eye (intraocular pressure). This increased pressure damages the optic nerve causing partial vision loss, with blindness as a possible outcome. Treatment in the form of eye drops can reduce intraocular pressure, but not restore vision already lost.*

Diabetic retinopathy *is a complication of diabetes. Elevated blood sugar damages the blood vessels that nourish the retina. Most of the vision loss due to diabetes can be prevented by early treatment.*

Source: Adapted from US National Library of Medicine 2001.

Based on results of the 2001 National Health Survey, 9.7 million Australians, or 51% of the population, had at least one sight problem (ABS 2002c). The most commonly reported eye disorders were refractive errors such as long-sightedness (22%), short-sightedness (21%), presbyopia (9%) and astigmatism (5%). All are correctable with lenses. Cataract and glaucoma, eye disorders that can cause vision impairment or blindness, were reported by 2% and 1% of respondents, respectively. The prevalence of sight problems rapidly increase with age, reaching 87% by ages 45–54 and 96% by ages 75 and over (Figure 2.7). Prevalence was also greater among females (55%) than males (47%).

Vision impairment and blindness are among the major causes of disability. According to the 1998 Survey of Disability, Ageing and Carers, 'loss of sight' was the reason or part of the reason for disability in 349,800 persons, 2% of the total population. It was the principal cause of disability in 113,200 persons and about 39,600 persons had a severe or profound 'core activity restriction' due to loss of sight (AIHW 2003a).



Source: ABS 2001 National Health Survey.

Figure 2.7: Self-reported prevalence of sight problems, 2001

Hearing loss

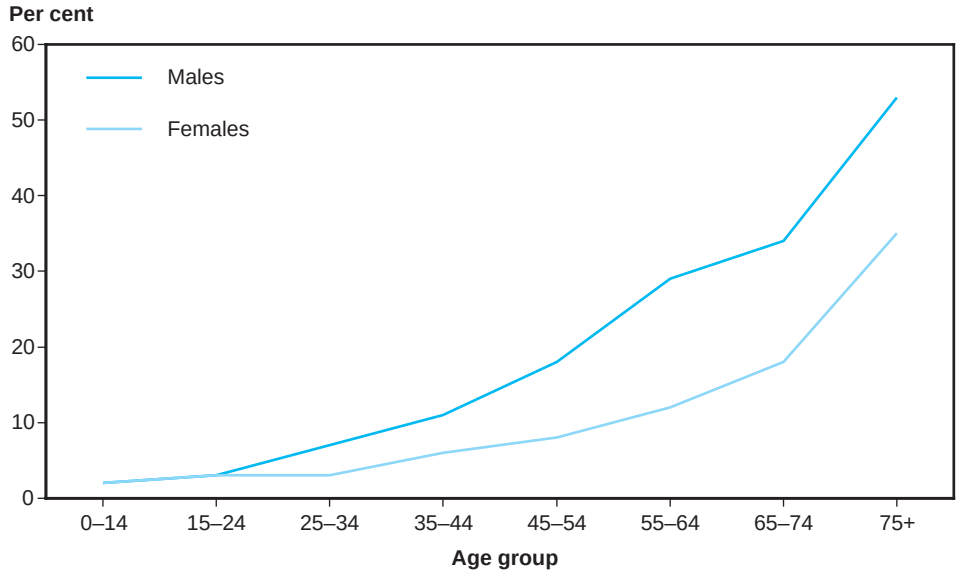
Hearing impairment can have serious consequences for both children and adults. Among children, it can hinder the development of language and communication skills, and lead to learning and social difficulties. In adults, it can have serious effects on a person's sense of wellbeing, social interaction and employment.

From self-reports in the 2001 National Health Survey, it was estimated that over two million Australians, or 11% of the population, had partial or complete deafness (ABS

2002c). The prevalence increased gradually from 2% at the youngest ages to 53% for males and 35% for females aged 75 and over (Figure 2.8).

These estimates may underestimate the prevalence of hearing loss. Objective assessments by trained audiologists report an overall prevalence of 22% for hearing impairment among people aged 15 and over in South Australia, compared with 13% through self-reports for the same age group in the 2001 National Health Survey. Approximately 17% of the total population had a level of impairment likely to cause some difficulties in speech discrimination (Wilson et al. 1998).

Major causes of hearing impairment differ between children and adults. In children, it is largely attributable to foetal infection, congenital malformation and genetic causes. Among adults, the impairment is significantly associated with age, male sex and occupational noise exposure (Wilson et al. 1998). Some ear diseases, such as tinnitus, Meniere's disease and otitis media, also increase the risk of hearing impairment.



Source: ABS 2001 National Health Survey.

Figure 2.8: Self-reported prevalence of partial or complete deafness, 2001

2.2 Functioning and disability

As mentioned in Chapter 1, the International Classification of Functioning, Disability and Health (ICF) has helped to broaden our view of health. For example, illness and injury are key factors in disturbing the normal structure or functions of the body, affecting the ability of many people to function and take part in the spectrum of activities of life. However, functioning and disability cannot be simply viewed in terms of signs and symptoms, or in terms of body and pain. These issues need to be further

conceptualised and described. This section begins by explaining some of the concepts used to understand and describe disability. It then provides summary statistics on the functional status of Australians.

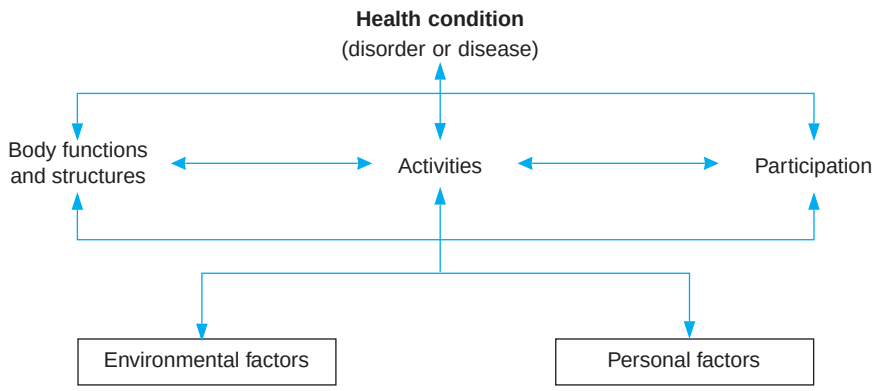
International Classification of Functioning framework

An understanding of functioning and disability requires a picture of an interrelated range of concepts that describe how humans function, alone or with others. These concepts are outlined by the ICF framework and their relationships are shown in Figure 2.9.

The ICF describes functioning and disability as multidimensional concepts relating to:

- the body functions and structures of people;
- the activities they do and the life areas in which they participate; and
- the factors in their environment which affect these experiences.

Each one of these components is defined in the context of a health condition. Disability is the umbrella term for any or all of an impairment of body structure or function, a limitation in activities, or a restriction in participation.



Source: WHO 2001a.

Figure 2.9: Interrelationships of aspects of functioning and disability under the ICF framework

The ICF views a person's functioning or disability as a dynamic interaction between health conditions and environmental and personal factors. Environmental factors—an important new component of the ICF—are included in recognition of their influence on functioning and disability. Although personal factors are acknowledged in the interactive model shown in Figure 2.9, they are beyond the scope of the ICF and thus it does not classify them. Such factors might include age, sex and Indigenous status, and would be selected by users according to the application. Definitions of various ICF components are given in Box 2.2.

Box 2.2: Definitions of ICF components

Body functions *are the physiological functions of body systems (including psychological functions).*

Body structures *are anatomical parts of the body such as organs, limbs and their components.*

Impairments *are problems in body function and structure such as significant deviation or loss.*

Activity *is the execution of a task or action by an individual.*

Participation *is involvement in a life situation.*

Activity limitations *are difficulties an individual may have in executing activities.*

Participation restrictions *are problems an individual may experience in involvement in life situations.*

Environmental factors *make up the physical, social and attitudinal environment in which people live and conduct their lives. These are either barriers to or facilitators of the person's functioning.*

Disability in Australia

While disability involves an interaction between health conditions and environment, broad measures of the level of disability in a society can be derived without a detailed focus on underlying heath conditions. This approach is important in assessing the need for assistance in a population. (Disability related to specific health conditions among older persons is described in detail in Chapter 8 of this report.)

The following information is based on the 1998 ABS Survey of Disability, Ageing and Carers. The ABS uses questions based on various ICF concepts to screen into the survey people with a mixture of specific and non-specific health conditions, impairments and/or activity limitations.

While most Australians are free from a disability for which they require assistance, many others, particularly those in the higher age groups, have more intensive care and assistance needs. From the 1998 survey, an estimated 19.3% of Australians, corresponding to 3.6 million persons, were categorised by the ABS as individuals with a disability (Table 2.7). Almost one-third of these, 1.1 million persons or 6.1% of the Australian population, required assistance with core activities of daily living (self-care, mobility and/or communication), and were therefore referred to by the ABS as having a 'severe or profound core activity restriction'.

Prevalence estimates for five main disability groups—'intellectual', 'psychiatric', 'sensory/speech', 'acquired brain injury' and 'physical/diverse'—are provided in Table 2.8. These disability groupings do not classify people; instead, they group aspects of people's experience in ways that are generally recognised in the disability field, and in legislative and administrative contexts in Australia (AIHW 2003b, 2003c).

Table 2.7: Main disabling conditions, 1998

Disabling condition	Age <65 years		Age 65+ years		All ages	
	Number ('000)	% of the population	Number ('000)	% of the population	Number ('000)	% of the total population
Main disabling condition						
Intellectual	209.0	1.3	*3.7	0.2	212.7	1.1
Psychiatric	197.2	1.2	87.3	3.8	284.5	1.5
Sensory/speech	235.8	1.4	193.8	8.5	429.6	2.3
Acquired brain injury	35.7	0.2	*3.5	*0.2	39.2	0.2
Physical/diverse	1,709.7	10.4	934.4	41.2	2,644.1	14.2
Total with a disability	**2,387.4**	**14.5**	**1,222.7**	**53.9**	**3,610.1**	**19.3**
Main disabling condition and a severe or profound core activity restriction						
Intellectual	101.3	0.6	**1.6	**0.1	103.0	0.6
Psychiatric	57.9	0.4	73.4	3.2	131.3	0.7
Sensory/speech	38.2	0.2	46.8	2.1	84.9	0.5
Acquired brain injury	10.8	0.1	**2.1	**0.1	12.9	0.1
Physical/diverse	447.9	2.7	356.5	15.7	804.4	4.3
Total with a severe/ profound core activity restriction	**656.1**	**4.0**	**480.4**	**21.2**	**1,136.5**	**6.1**

Note: Estimates marked with * have an associated relative standard error (RSE) of between 25% and 50%. Estimates marked with ** have an associated RSE of 50% or more. All such estimates should be interpreted accordingly.

Source: AIHW 2003a: Table S1.

Focusing on estimates based on 'all disabling conditions' reported by or for people:

- **Physical/diverse disabilities** were the most commonly reported disabilities. Around 3,028,500 Australians (16.2% of the total population) of all ages had one or more physical/diverse disabilities in 1998. Of these, 2,853,400 also had one or more activity limitations or participation restrictions. Less than one-third of persons with physical/diverse disability (975,400 persons) had a severe or profound core activity restriction.
- One or more **intellectual disabilities** were experienced by 503,000 persons of all ages, or 2.7% of Australians. Of these, 496,500 also had one or more activity limitations or participation restrictions. More than half of the persons with intellectual disabilities (301,900 persons) had a severe or profound core activity restriction.
- **Psychiatric disability** was experienced by 768,900 persons (4.1% of the total population), of whom 757,100 had activity limitations or participation restrictions. A little over half of those with a psychiatric disability (398,300 persons) had a severe or profound core activity restriction.
- **Sensory/speech disability** was experienced by 1,404,600 persons (7.5% of the total population), of whom 1,286,900 had activity limitations or participation restrictions. Close to four out of 10 persons (524,000) with sensory/speech disability had a severe or profound core activity restriction.

- **Disabilities associated with an acquired brain injury** were experienced by 211,100 persons (1.1% of the total population), of whom 201,600 had activity limitations or participation restrictions. More than one-half of the persons with an acquired brain injury (113,300 persons) had a severe or profound core activity restriction.

Table 2.7 describes the distribution of main disabling conditions. Physical/diverse disabilities were not only the most common disabilities noted in the population but were also the main disabling condition in 2.6 million persons (14.2% of the total population).

Table 2.8: Prevalence of disabling conditions, 1998

	Age <65 years		Age 65+ years		All ages	
Disability group	**Number ('000)**	**% of the population**	**Number ('000)**	**% of the population**	**Number ('000)**	**% of the total population**
All disabling conditions						
Intellectual	376.9	2.3	126.1	5.6	503.0	2.7
Psychiatric	504.1	3.1	264.8	11.7	768.9	4.1
Sensory/speech	685.7	4.2	718.9	31.7	1,404.6	7.5
Acquired brain injury	159.0	1.0	52.0	2.3	211.1	1.1
Physical/diverse	1,903.9	11.6	1,124.6	49.6	3,028.5	16.2
All disabling conditions and activity limitations and participation restrictions						
Intellectual	370.4	2.3	126.1	5.6	496.5	2.7
Psychiatric	493.5	3.0	263.6	11.6	757.1	4.1
Sensory/speech	597.9	3.6	689.0	30.4	1,286.9	6.9
Acquired brain injury	150.8	0.9	50.8	2.2	201.6	1.1
Physical/diverse	1,771.2	10.8	1,082.2	47.7	2,853.4	15.3
All disabling conditions and severe or profound core activity restrictions						
Intellectual	184.8	1.1	117.1	5.2	301.9	1.6
Psychiatric	209.9	1.3	188.4	8.3	398.3	2.1
Sensory/speech	218.7	1.3	305.5	13.5	524.2	2.8
Acquired brain injury	75.2	0.5	38.2	1.7	113.3	0.6
Physical/diverse	517.2	3.2	458.3	20.2	975.4	5.2

Source: AIHW 2003a: Table S1.

2.3 Morbidity and illness

Another major indicator of the health of a population is the extent of morbidity and illness in the population. Such information is important in gauging the need for health services and care. The term 'morbidity' often covers disability. However, in this section morbidity covers the presence of a disease, condition or a disorder. Illness in this context refers to the state of feeling unwell (see Box 2.3). Disability has been discussed in Section 2.2.

Box 2.3: Disease, illness, condition or disorder

*A **disease** is a physical or mental disturbance involving symptoms (such as pain or feeling ill), dysfunction or tissue damage. **Illness** is often used synonymously with disease, but preferably refers to a state of feeling unwell or injured. **Health condition** is a broad term that can be applied to any health problem, including symptoms, diseases, and risk factors such as high blood pressure or obesity. As used here, the term **disorder** is synonymous with condition.*

Several different measures can be used to determine the extent of morbidity and illness in the population. The estimates can be generated in terms of disease incidence, prevalence and case fatality. This information can be obtained from a variety of data sources including population health surveys, disease registers and administrative collections of health service use. The dynamics of the natural history of the disease and severity of the problem can also be studied.

Information on the incidence of common diseases in Australia is limited because of difficulties with definitions and methods. It is often too costly or difficult to use expert methods to diagnose many diseases in surveys that are large enough to represent the population. Therefore, objective information on disease prevalence is difficult to obtain on some of the major diseases. The following information on the extent of morbidity and illness in the Australian population is based on self-reports.

Disease prevalence

The ABS has periodically conducted a National Health Survey since 1977–78 to help assess the level of health and disease in the Australian population (excluding those in hospitals, nursing homes and non-private dwellings). The most recent of these surveys, conducted in 2001, collected self-reported information on the prevalence of a range of diseases, illnesses, conditions and disorders that had lasted or were expected to last for six months or more.

In 2001, 78% of respondents in the National Health Survey said they had one or more long-term health conditions. Among those aged 15 and over, this prevalence was 87%. The corresponding levels in 1995 were 76% and 83% (ABS 2002c).

Table 2.9 lists the most commonly reported long-term conditions in 2001, each reported by 9% or more of survey respondents. Three of these were problems with eyesight: long-sightedness, short-sightedness and presbyopia. Respiratory problems—including hay fever and allergic rhinitis, asthma and chronic sinusitis—were also among the most commonly reported conditions. Other common conditions were back and disc problems, arthritis (all forms), deafness (complete or partial) and hypertensive disease (high blood pressure).

In addition, 21 conditions were each reported by at least 1% of respondents. These are listed in Table 2.10. Migraine and high blood cholesterol levels were each reported by more than 6% of respondents. Circulatory (cardiovascular) diseases, diabetes, neoplasms (including cancers) and mental disorders also feature in this list.

Table 2.9: Most-commonly reported long-term conditions, population prevalence estimates, 2001

	Number ('000)			Rate (per cent)		
Condition	**Males**	**Females**	**Persons**	**Males**	**Females**	**Persons**
Long-sightedness	1,867	2,343	4,210	20.4	24.3	22.4
Short-sightedness	1,685	2,257	3,941	18.3	23.5	20.9
Back pain/disc disorders	1,944	1,993	3,937	21.0	20.7	20.9
Hay fever & allergic rhinitis	1,414	1,522	2,953	15.1	15.9	15.6
Arthritis (all forms)	1,042	1,535	2,576	11.7	15.8	13.9
Asthma	993	1,203	2,197	10.5	12.6	11.6
Chronic sinusitis	833	1,187	2,020	8.9	12.4	10.5
Deafness (complete/partial)	1,267	745	2,013	14.2	7.7	10.8
Hypertensive disease (high blood pressure)	869	1,040	1,909	9.7	10.7	10.3
Presbyopia	792	886	1,677	9.1	9.0	9.0

Note: Rates are age-standardised to the 2001 Australian population.

Source: AIHW analysis of ABS 2001 National Health Survey.

Table 2.10: Frequently reported long-term conditions, population prevalence estimates, 2001

	Number ('000)			Rate (per cent)		
Condition	**Males**	**Females**	**Persons**	**Males**	**Females**	**Persons**
Migraine	334	836	1,171	3.6	8.7	6.2
High blood cholesterol	588	544	1,132	6.5	5.6	6.1
Astigmatism	366	512	878	3.9	5.3	4.6
Anxiety-related problems	317	536	853	3.4	5.6	4.5
Mood disorders	320	529	849	3.4	5.5	4.5
Bronchitis/emphysema	316	349	665	3.5	3.6	3.6
Diabetes (all forms)	272	283	554	3.0	2.9	3.0
Stomach/duodenal/ gastrointestinal ulcer	249	256	506	2.8	2.7	2.7
Varicose veins	98	342	440	1.1	3.5	2.3
Hernia	220	160	380	2.5	1.6	2.0
Cataract	122	239	361	1.5	2.4	2.0
Tachycardia	144	195	338	1.7	2.1	1.9
Psoriasis	143	192	335	1.5	2.0	1.8
Neoplasms (including cancers)	176	135	311	2.0	1.4	1.7
Osteoporosis	52	248	300	0.6	2.5	1.6
Oedema (swelling)	88	208	296	1.0	2.1	1.6
Angina	138	123	260	1.6	1.2	1.4
Rheumatism	114	134	248	1.3	1.4	1.3
Anaemias	28	217	245	0.3	2.3	1.3
Haemorrhoids	89	120	209	1.0	1.2	1.1
Dermatitis and eczema	95	112	207	1.0	1.2	1.1

Note: Rates are age-standardised to the 2001 Australian population.

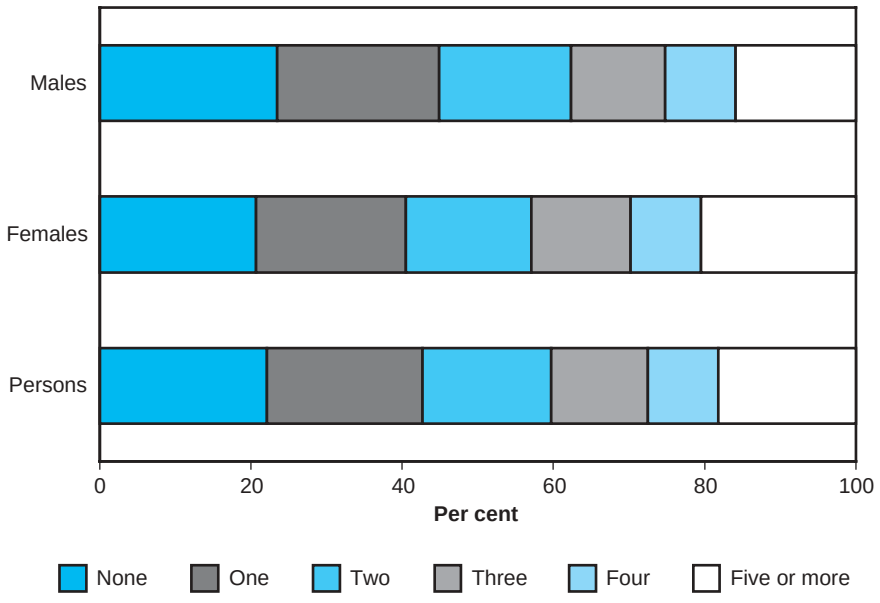
Source: AIHW analysis of ABS 2001 National Health Survey.

Many of these long-term conditions were more likely to be reported by females. They were nearly eight times as likely as males to report anaemias, four times as likely to report osteoporosis, three times as likely to report varicose veins, and twice as likely to report migraine and oedema. In contrast, more males reported deafness, hernia, neoplasms (including cancers), angina and high cholesterol than females, although for each of these the male prevalence rate was less than twice the female rate.

The estimates provided in Tables 2.9 and 2.10 may not be true measures of prevalence as they are based on self-reports rather than physical examination and medical tests. It may be that some diseases are over-reported because the respondent confused the name of the disease or a doctor at some time had only raised the possibility of the disease but not made a diagnosis. On the other hand, many diseases produce few or no symptoms, at least in their early stages, so this could lead to under-reporting.

Comorbidity

The prevalences of the 31 diseases and conditions listed in Tables 2.9 and 2.10 add up to more than 100%. This is because 57% of those in the survey reported having two or more conditions (comorbidity), with 18% reporting five or more conditions (Figure 2.10).

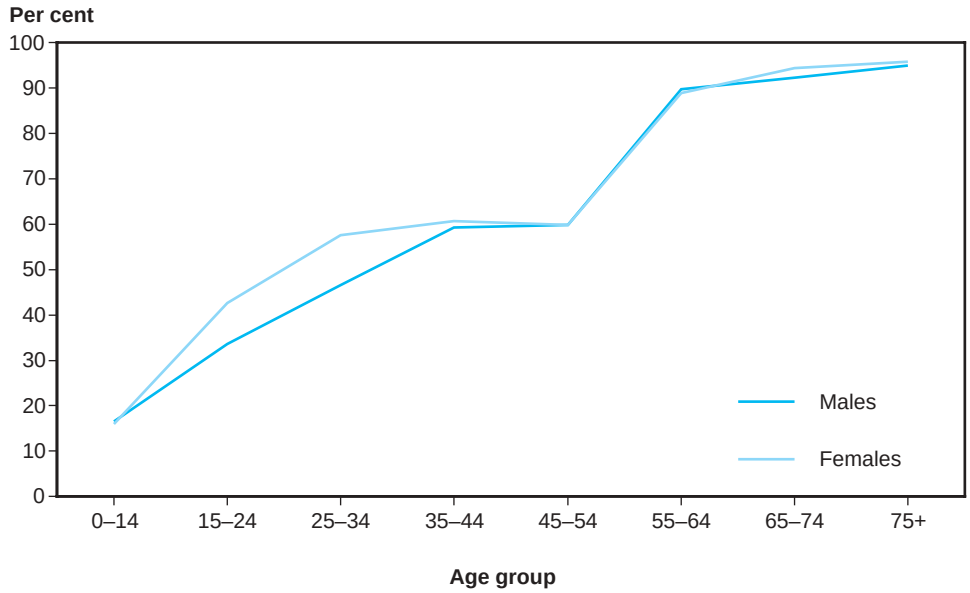


Source: AIHW analysis of ABS 2001 National Health Survey.

Figure 2.10: Distribution of number of reported long-term conditions, 2001

The coexistence of two or more conditions is highly correlated with age, rising from 16% among those aged 0–14 to 96% among those aged 75 and over. The increase in comorbidity with age plateaus at around 60% in ages 35–54, before rising again to 90% at ages 55–64.

A larger proportion of females (60%) than males (55%) reported two or more conditions (Figure 2.10). In part, this is because a greater proportion of the female population is in the older age ranges where comorbidity is more common. Also, although roughly equal proportions of males and females with comorbidity reported two, three and four conditions in 2001, a higher proportion of females reported five or more conditions (21% compared with 16%). It is also worth noting that, while the age-specific patterns of comorbidity are generally similar in both males and females, the prevalence rates among females are about 10% higher than those among males at ages 15–34 (Figure 2.11).



Source: AIHW analysis of ABS 2001 National Health Survey.

Figure 2.11: Age-specific reporting of two or more long-term conditions, 2001

Illness and pain

A considerable proportion of the population suffers from conditions that often cause illness (a state of feeling unwell) and pain (Tables 2.9 and 2.10). Major conditions in the second category are musculoskeletal disorders, including back pain/disc disorders, arthritis and rheumatism. Other frequently reported conditions causing physical pain are migraine, digestive system ulcers, varicose veins, hernia and haemorrhoids. Furthermore, many people suffer emotional distress through anxiety-related and mood disorders.

There are no national data on the prevalence of pain in Australia. However, in a large telephone survey of adults aged 16 and over in New South Wales in 1997 (Blyth et al. 2001), chronic pain (defined as pain experienced every day for three months in the six months before interview) was reported by 17% of male and 20% of female respondents. The reporting of pain was strongly associated with age, reaching 30% among those in older age groups. Interference in daily activities due to chronic pain was reported by 11% of male and 14% of female respondents, and was the highest in the 55–59 age group (17% in males and 20% in females).

2.4 Injuries

Injury and poisoning (together called 'injury' in this section) are the leading cause of mortality and large contributors to morbidity in the first half of the life span in Australia. Despite recent advances in road safety and occupational health and safety, injuries also contribute significantly to emergency department visits, hospitalisation, disability, and health system costs.

In view of injury's high impact and strong preventability, injury prevention and control was made one of the National Health Priority Areas from the outset of the initiative. The National Injury Prevention Advisory Council has recommended four main areas—falls in older people, falls in children, drowning and near-drowning, and poisoning in children—for focused attention under its National Injury Prevention Plan (DHAC 2001).

A variety of factors affect a person's risk of being injured. Prominent among these are age, sex, alcohol use, residence, ethnicity, socioeconomic status and occupation. These personal risk factors influence the type of 'external' cause of injury that occurs, such as falls, poisoning, drowning and so forth. The effects of injury on the health of Australians may thus be viewed through the external cause of injury, in particular those that result in death and hospitalisation.

Injury-related deaths

Injuries accounted for 5.8% of all deaths in 2002. A total of 7,820 deaths (5,271 males and 2,549 females) were registered as being due to an external cause of injury or poisoning. Almost one-third (2,445 deaths, 31.3%) of these deaths were of males aged between 20 and 44.

Among those aged less than 45, injury was the leading cause of death, representing 43.0% of all deaths in that age group. Injury death rates were the highest among young males and for both sexes in old age.

Suicide accounted for the largest proportion (2,320 deaths, 29.7%) of injury deaths in 2002, followed by deaths due to transport injuries (1,907 deaths, 24.4%) and falls (1,517 deaths, 19.4%) (Table 2.11).

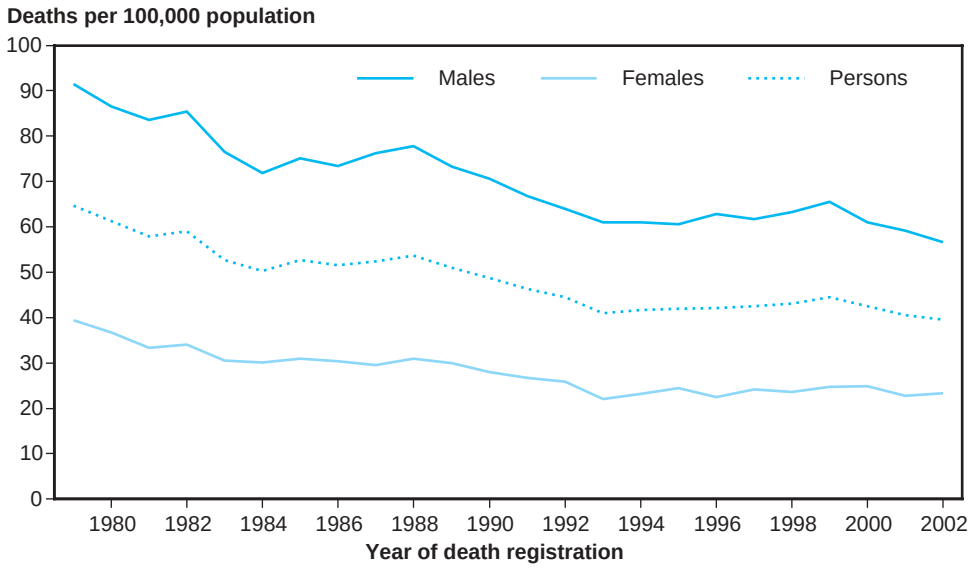
Trends in injury deaths

Injury deaths have declined significantly over the past several decades. However, throughout the 1990s the death rates showed little change (Figure 2.12).

Table 2.11: Deaths due to injury and poisoning, 2002

External cause group	Males	Females	Total	Per cent of all injury deaths
Transportation	1,403	504	1,907	24.4
Drowning	176	56	232	3.0
Poisoning, pharmaceuticals	318	178	496	6.3
Poisoning, other substances	55	17	72	0.9
Falls	674	843	1,517	19.4
Fires/burns/scalds	72	43	115	1.5
Other unintentional	458	198	656	8.4
Intentional, self-inflicted	1,817	503	2,320	29.7
Intentional, inflicted by another	199	104	303	3.9
Undetermined intent	35	30	65	0.8
Complications of medical and surgical care	64	73	137	1.8
Total	**5,271**	**2,549**	**7,820**	**100.0**

Source: AIHW National Mortality Database.



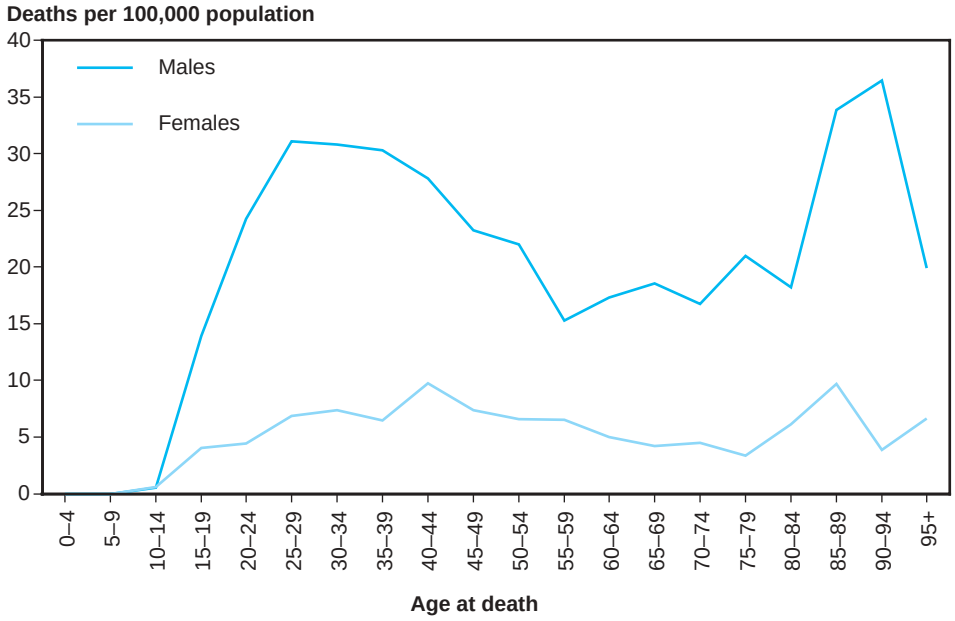
Note: Age-standardised to the Australian population at 30 June 2001.

Source: AIHW National Mortality Database.

Figure 2.12: Trends in injury death rates, 1979 to 2002

Suicide

Suicide is a leading cause of injury death, comprising nearly 30% of all such deaths in 2002. As in previous years, the male suicide rate was considerably higher than that for females, across all age groups. Similarly, the male rate showed characteristic peaks in early adulthood (25–39 years) and old age (85 years and over), whereas the female rate remained relatively constant across all age ranges (Figure 2.13).



Source: AIHW National Mortality Database.

Figure 2.13: Age-specific distribution of suicide, 2002

Suicide rates have declined in recent years in Australia, from 14.7 per 100,000 persons in 1997 to 11.8 in 2002. This is chiefly due to a reduction in rates for young adult males, whose suicide rates are the lowest since 1984. Rates for older males and for females have also declined, but to a smaller extent and with smaller effect on the number of suicide deaths.

The suicide rate for males aged 15 to 29 peaked at 34.0 per 100,000 persons in 1997, after which it declined sharply to 24.2 in 2000. The rate was similar in 2001 (24.5) and declined further in 2002 to 23.1. The number of deaths corresponding to these rates was 711 in 1997, declining to 475 in 2002. Corresponding numbers for all ages were 2,720 in 1997 and 2,320 in 2002.

Transportation

There were 1,907 deaths attributed to transportation (mainly road accidents) in 2002, comprising 24.4% of all deaths due to injury in that year, at an age-standardised rate of 9.7 per 100,000 persons. This was a slight decrease from the rate in 2001 (10.3 per 100,000). Age-specific rates of death due to transportation vary greatly, being highest among young adults, lower in middle age, and rising again with age at older ages. The male age-standardised death rate was 2.9 times the rate for females. Among those aged 25–34, the male rate was five times the female rate. These differences can be explained in part by risk-taking behaviour in young males and related variations in risk exposure (Senserrick et al. 2003; Symmons et al. 2004).

There was much variation in the proportion of deaths due to various modes of transport (Table 2.12). Motor vehicle traffic accidents were the major contributor (87.3%) to transport-related deaths.

Table 2.12: Transport-related deaths, 2002

Type of transport	Males	Females	Total	Per cent of all transport deaths
Motor vehicle traffic	1,206	460	1,666	87.3
Occupant (car, truck, van, etc.)	760	344	1,104	57.9
Motorcyclist	199	15	214	11.2
Pedal cyclist	29	4	33	1.7
Pedestrian	169	75	244	12.8
Unspecified	49	22	71	3.7
Pedal, other	6	0	6	0.3
Pedestrian, other	42	21	63	3.3
Other land transport	80	11	91	4.8
Other transport	69	12	81	4.2
Total	**1,403**	**504**	**1,907**	**100.0**

Source: AIHW National Mortality Database.

Falls

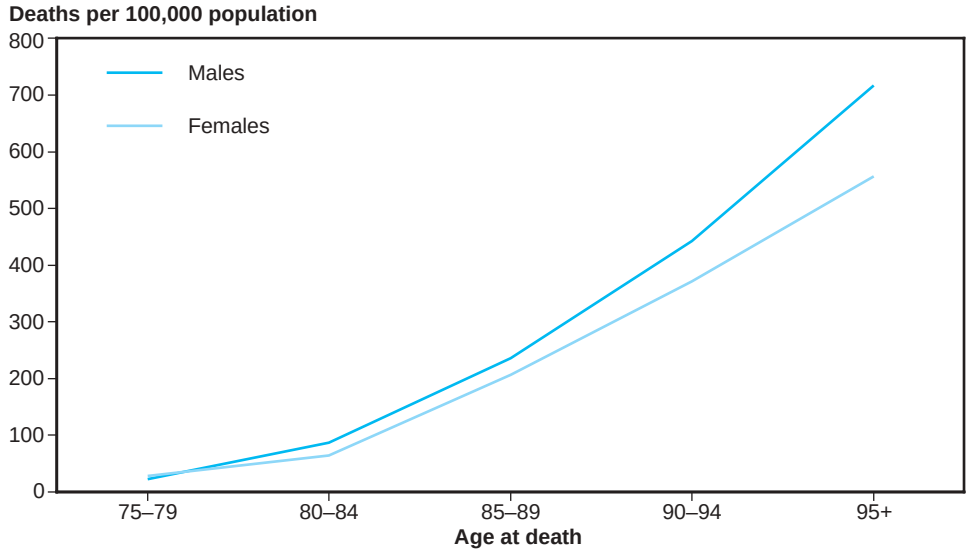
Deaths due to accidental falls numbered 1,517 in 2002, accounting for 19.4% of all deaths due to injury in 2002 (Table 2.11). More than three-quarters of the deaths (78.4%) occurred in ages 75 and over, and females were much less likely to have fatal falls below this age than males. In those aged 75 and over, the rates rose rapidly with advancing age, especially from about 85 years on (Cripps et al. 2002) (Figure 2.14).

Age-specific rates were similar for both males and females at older ages, but males were predominant among the (much less numerous) deaths due to falls at younger ages. The overall age-standardised death rate was higher among males (8.9 deaths per 100,000) than females (6.5 deaths per 100,000).

Indigenous deaths

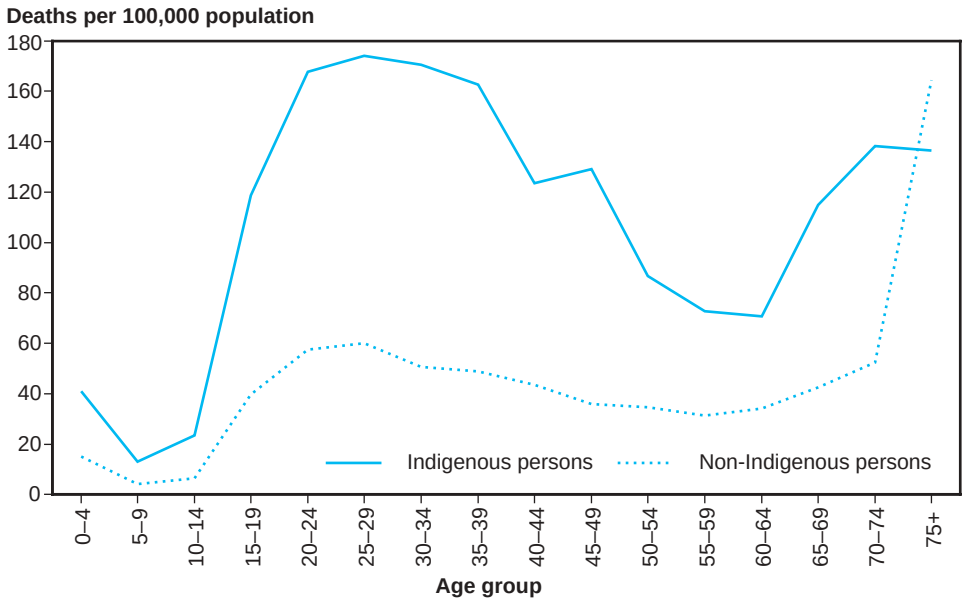
Injury mortality is substantially higher among Indigenous than non-Indigenous Australians. Due to incompleteness and poor enumeration of Indigenous deaths and population numbers, the statistics presented here are derived from data collected in South Australia, Western Australia, Queensland and the Northern Territory only. Data from these jurisdictions are considered to be more complete than in other states and the Australian Capital Territory, though still subject to uncertainties (Harrison et al. 2001).

Indigenous deaths due to injury and poisoning accounted for 8.0% of all deaths registered in those parts of Australia (252 out of 2,896 deaths) in 2002. Intentional self-harm (suicide) was the leading cause (34.1% of Indigenous injury deaths), followed by deaths related to transport accidents (27.0%). The proportion of injury deaths attributed to assault was much higher in the Indigenous population (12.7% of injury deaths) than in the non-Indigenous population (3.5%). The relative excess of injury deaths among Indigenous persons occurred across nearly all age groups (Figure 2.15).



Source: AIHW National Mortality Database.

Figure 2.14: Age-specific death rates due to falls among older people, 2002



(a) Western Australia, South Australia, Northern Territory and Queensland only.

Source: AIHW National Mortality Database.

Figure 2.15: Age-specific death rates for injury among Indigenous and non-Indigenous persons, 1997–2002[(a)]

Hospitalisation due to injury

Injury is a large cause of hospitalisation in Australia, accounting for about 6.8% of hospital separations from public, private and psychiatric hospitals in 2001–02. The separation rate for injury was much higher for males than for females (an age-standardised ratio of 1.39:1). Other key indicators of injury separations further emphasise this difference (Table 2.13).

Table 2.13: Key indicators for separations due to injury, 2001–02

Measure	Males	Females	Persons
Number of injury separations	249,939	186,566	436,513
All hospital separations	2,974,106	3,420,234	6,394,498
Injury as percentage of total[(a)]	8.4	5.5	6.8
Crude separation rate[(b)]	2,579	1,897	2,235
Age-standardised separation rate[(b) (c)]	2,626	1,806	2,232

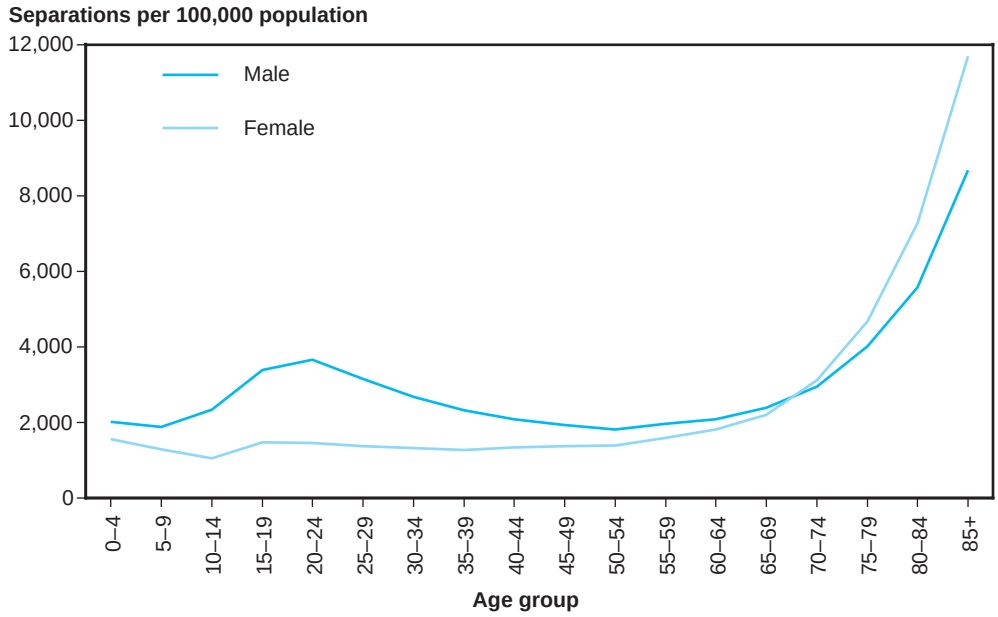
(a) Hospital separations due to injury and poisoning as percentage of all separations.

(b) Number per 100,000 population.

(c) Age-standardised to the Australian population at 30 June 2001.

Source: AIHW National Hospital Morbidity Database.

Age-specific hospitalisation rates for females were much the same for all age groups from 15–19 to 50–54 (Figure 2.16). The rates were higher for males in their teens and twenties than for boys or middle-aged men, levelling out at the 50–54-years age group. In the elderly (65 and over), rates in both sexes increased rapidly, reaching maximum rates in the very old. In the age groups 75 and above, the female rates were higher than the male rates.



Source: AIHW National Hospital Morbidity Database.

Figure 2.16: Age-specific hospital separation rates for injury, 2001–02

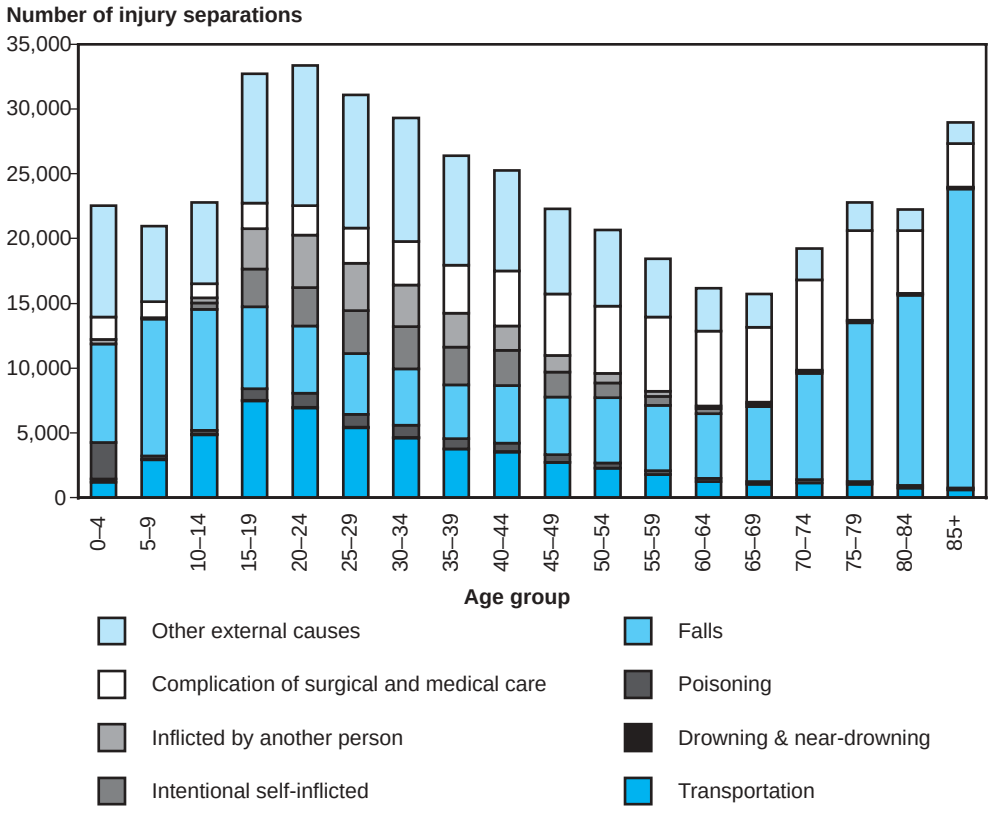
External causes

Common types of external cause of the injury cases which separated from hospitals in 2001–02 are shown in Figure 2.17.

The most common of these external causes among males was falls (26.4%), followed by transportation (14.9%) and complications of medical and surgical care (14.7%). In female hospital separations, falls (40.7%) were followed by complications of medical and surgical care (19.1%) and transportation (9.1%) as the three most common external causes.

Males had a higher hospitalisation rate than females for intentional injuries inflicted by another person, with the ratio being nearly 3:1. Transportation and drowning as external causes for hospital separations were also twice as common in males. The rate for intentional self-inflicted injury was, however, higher among females.

Proportions of injury separations by external cause group were very similar to those seen in 1999–00, and the rank order of the categories remained unchanged.



Source: AIHW National Hospital Morbidity Database.

Figure 2.17: External causes of hospital separations by age group, 2001–02

2.5 Mortality

Death rates and causes of death are key indicators of the health of a population. They not only reflect circumstances around the time of death but also provide some insight into changing social and environmental conditions, medical interventions, lifestyles and trends in underlying risk factors.

This section describes the patterns of mortality in the Australian population, examining causes of death, age and sex patterns, and their recent and long-term trends. Box 2.4 refers to some important considerations in making comparisons using mortality data.

Box 2.4: Comparing death rates: age-standardisation and disease classification

Statistics relating to deaths are sometimes presented as crude death rates, that is, the number of deaths in a year divided by the size of the corresponding population indexed to 100,000. The crude death rate in Australia was 680 deaths per 100,000 persons in 2002.

However, the risk of dying varies greatly with age. This may make comparisons across populations misleading if they have different age structures, and even small age differences may lead to false conclusions. Similarly, analysis of time trends in death rates may be flawed unless this age relationship is taken into account. Age-specific comparisons can be made, that is, comparing death rates at specific ages, but this can be cumbersome because it requires numerous comparisons. However, variations in age structure, between populations or over time, can be adjusted by a statistical procedure called age-standardisation.

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

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

A total of 133,707 deaths were recorded in Australia in 2002, approximately 5,200 more than in 2001. About 70% of male deaths and 80% of female deaths were of people aged 65 or older. The median ages at death in 2002 were 76.2 years for males and 82.2 years for females, and the age-standardised rates were 821 deaths per 100,000 males and 543 deaths per 100,000 females.

There has been a steady increase in the number of deaths in Australia since 1982, by an average of 0.8% annually, reflecting the increasing size of the population. However, the crude death rate has fallen from 756 per 100,000 in 1982 to 680 in 2002—in spite of the ageing of the Australian population.

Male deaths outnumber female deaths. There were 68,885 male and 64,822 female deaths in 2002, with a crude ratio of 106 male deaths for every 100 female deaths. This gap has closed considerably over the last two decades: in 1982 the ratio was 123 to 100. This change was due primarily to greater improvement in male mortality, relative to female mortality, at older ages (Table 2.14).

Table 2.14: Age- and sex-specific distribution of deaths, 2002

	Males		Females		Sex ratio	
Age (years)	Number	Age-specific rate[(a)]	Number	Age-specific rate[(a)]	Crude[(b)]	Age-specific[(c)]
0	699	553.6	565	471.2	124	117
1–14	374	19.5	244	13.4	153	146
15–24	1,058	76.4	382	28.6	277	267
25–44	3,772	129.5	1,884	63.9	200	203
45–64	11,609	502.7	7,162	311.7	162	161
65–84	36,889	3,626.5	28,766	2,412.4	128	150
85+	14,433	16,440.7	25,787	13,389.1	56	123
Missing age	51	. .	32	. .	. .	. .
Total	**68,885**	**705.7**	**64,822**	**653.9**	**106**	**108**

. . Not applicable.

(a) Age-specific rate per 100,000 population.

(b) Male deaths per 100 female deaths.

(c) Male rates divided by female rates, multiplied by 100.

Source: AIHW National Mortality Database.

Major causes of death

The 'cause of death' information, gained from death certificates, provides insights into the events close to the end of life that either directly lead to or contribute to death. Such information also provides insights into factors that contribute to mortality at the population level.

Cause of death statistics usually rely on the 'underlying cause', which is the single disease, medical condition or event considered to be most directly responsible for the death. In addition, other conditions or events that are not the underlying cause, but are still considered to contribute to the death, are known as associated causes.

The mortality information provided below has been organised to reflect the underlying cause of death at a specific disease level rather than at a broad ICD chapter level. Information on cancer deaths, for example, has been provided according to individual cancer types. Similarly, information on circulatory (cardiovascular) diseases has been categorised to the level of more specific diseases or conditions. However, to present information for various age groups, statistics are provided at the ICD chapter level.

Leading underlying causes of death

The top 20 specific causes of death given in Table 2.15 were responsible for about 75% of all deaths in 2002. Coronary heart disease (also known as ischaemic heart disease: heart attack and related disorders) and cerebrovascular disease (stroke) were the two leading specific causes of death in both sexes and accounted for approximately 30% of all deaths that year.

Table 2.15: Leading underlying causes of death, all ages, 2002

	Males			Females		
Rank	Cause of death	Number of deaths	% all male deaths	Cause of death	Number of deaths	% all female deaths
1	Ischaemic heart disease (I20–I25)	13,855	20.1	Ischaemic heart disease (I20–I25)	12,208	18.8
2	Cerebrovascular disease (I60–I69)	4,969	7.2	Cerebrovascular disease (I60–I69)	7,564	11.7
3	Lung cancer (C33–C34)	4,760	6.9	Other heart diseases (I05–I09, I11, I13, I26, I27, I30–I52)	4,687	7.2
4	Other heart diseases (I05–I09, I11, I13, I26, I27, I30–I52)	3,423	5.0	Dementia and related disorders (F01–F03, G30–G32)	3,024	4.7
5	Chronic obstructive pulmonary disease (J41–J44)	3,327	4.8	Breast cancer (C50)	2,698	4.2
6	Prostate cancer (C61)	2,852	4.1	Lung cancer (C33–C34)	2,543	3.9
7	Colorectal cancer (C18–C21)	2,448	3.6	Chronic obstructive pulmonary disease (J41–J44)	2,270	3.5
8	Suicide (X60–X84)	1,817	2.6	Colorectal cancer (C18–C21)	2,201	3.4
9	Diabetes (E10–E14)	1,771	2.6	Pneumonia and influenza (J10–J18)	1,731	2.7
10	Dementia and related disorders (F01–F03, G30–G32)	1,461	2.1	Diabetes (E10–E14)	1,558	2.4
11	Diseases of the arteries, arterioles and capillaries (I7)	1,382	2.0	Unknown primary site cancers (C76–C80, C26, C39)	1,378	2.1
12	Pneumonia and influenza (J10–J18)	1,353	2.0	Diseases of the arteries, arterioles and capillaries (I7)	1,259	1.9
13	Land transport accidents (V00–V89)	1,329	1.9	Renal failure (N17–N19)	1,006	1.6
14	Unknown primary site cancers (C76–C80, C26, C39)	1,268	1.8	Pancreatic cancer (C25)	891	1.4
15	Pancreatic cancer (C25)	943	1.4	Ovarian cancer (C56)	852	1.3
16	Renal failure (N17–N19)	919	1.3	Lymphomas (C81–C85, C96)	733	1.1
17	Liver diseases (K70–K77)	918	1.3	Exposure to unspecified factor (X59)	606	0.9
18	Lymphomas (C81–C85, C96)	864	1.3	Leukaemia (C91–C95)	581	0.9
19	Leukaemia (C91–C95)	843	1.2	Septicaemia (A40–A41)	572	0.9
20	Stomach cancer (C16)	762	1.1	Suicide (X60–X84)	503	0.8
	Total leading causes	**51,264**	**74.4**	**Total leading causes**	**48,865**	**75.4**
	All deaths	**68,885**	**100**	**All deaths**	**64,822**	**100**

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

Source: AIHW National Mortality Database.

Lung cancer was the third leading underlying cause of male deaths, followed by 'other heart diseases', a category which includes heart failure. In contrast, 'other heart diseases' was the third leading cause of mortality among females, followed by dementia and related disorders. Prostate cancer and suicide were other prominent causes of male deaths. In females, breast cancer, and pneumonia and influenza were prominent. Lung cancer, chronic obstructive pulmonary disease (COPD), colorectal cancer, dementia and diabetes were among the top 10 leading causes of death in both sexes. Other than suicide, and pneumonia and influenza, all conditions listed as top 10 causes of death are generally chronic in nature.

Major underlying causes of death by life stage

The relative contribution of different underlying causes of death varies with age, as shown in Table 2.16. Conditions emerging from the perinatal period dominate the infant mortality statistics, followed by congenital anomalies. Similarly, injuries and poisoning are the most common cause of death in the age groups 1–14 and 15–24.

Table 2.16: Leading underlying causes of death[(a)] by age group, 2002

	Males		Females	
Age group	**Cause of death**	**% deaths[(b)]**	**Cause of death**	**% deaths[(b)]**
Infants (less than one year)	Conditions emerging from the perinatal period	50.9	Conditions emerging from the perinatal period	52.4
	Congenital anomalies	20.9	Congenital anomalies	24.4
	Sudden death	10.6	Sudden death	8.0
	Nervous system diseases	2.6	Injury and poisoning	3.0
1–14	Injury and poisoning	40.4	Injury and poisoning	32.0
	Cancer	17.1	Cancer	22.1
	Nervous system diseases	9.4	Nervous system diseases	10.7
	Congenital anomalies	7.2	Congenital anomalies	7.4
15–24	Injury and poisoning	75.8	Injury and poisoning	59.4
	Cancer	7.0	Cancer	11.5
	Nervous system diseases	4.9	Nervous system diseases	4.2
	Cardiovascular disease	3.4	Endocrine disorders	4.2
25–44	Injury and poisoning	52.4	Cancer	34.7
	Cancer	14.0	Injury and poisoning	31.5
	Cardiovascular disease	13.5	Cardiovascular disease	11.1
	Digestive disorders	3.7	Nervous system disease	3.6
45–64	Cancer	40.8	Cancer	56.4
	Cardiovascular disease	28.6	Cardiovascular disease	15.8
	Injury and poisoning	9.7	Injury and poisoning	5.9
	Digestive disorders	5.0	Respiratory system diseases	5.8
65–84	Cardiovascular disease	36.1	Cardiovascular disease	37.9
	Cancer	35.4	Cancer	31.0
	Respiratory system diseases	10.1	Respiratory system diseases	9.5
	Endocrine	3.7	Endocrine	4.1
85+	Cardiovascular disease	44.8	Cardiovascular disease	53.2
	Cancer	17.1	Cancer	10.8
	Respiratory system diseases	12.0	Respiratory system diseases	8.7
	Genitourinary diseases	3.5	Mental disorders	4.7

(a) Organised at ICD chapter level.

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

Source: AIHW National Mortality Database.

The shifts with age in leading causes of death to chronic diseases reflects both longer exposure to various environmental factors and the underlying ageing processes. Among those aged 25–44, injuries are the leading cause of death in males, but cancer takes over as the leading cause of death among females. In both sexes, cancer is the most common cause of death among those aged 45–64, followed by cardiovascular disease, which includes both coronary heart disease and stroke. Cardiovascular disease becomes the most prominent cause of death among those aged 65 and over.

Mention must be made of the importance of respiratory diseases as an underlying cause of death with advancing age. Prominent among these is COPD, a leading contributor to deaths overall. Respiratory diseases are responsible for almost 10% of deaths among persons aged 65 and over. Endocrine diseases, mainly diabetes, are another leading cause of death among those aged 65–84. The endocrine death statistics provided here do not reflect the contribution diabetes makes to other underlying causes of death, in particular cardiovascular diseases.

Associated causes of death

A fuller picture of events and circumstances around the time of death may be generated from 'multiple causes of death' data, made available by the ABS since 1997. This data set includes all causes and conditions reported on the death certificate, listed either as an underlying cause or an associated cause of death. The information is useful for further assessing the contribution of a disease or condition to death.

In assessing the contribution of various disorders to death, it may be useful to examine the underlying cause as a proportion of all listings, both underlying and associated (Table 2.17). Cancer is mostly listed as an underlying cause of death: when it was listed on the death certificate during 1997–02 it was as an underlying cause 88% of the time for males and 90% for females. On the other hand, other circulatory diseases (other than coronary heart disease (CHD) and stroke) were listed as an underlying cause of death in less than 25% of cases.

Table 2.17: Selected diseases as underlying or associated causes of death, 1997–02

Type of cause of death	Cause of death					
	CHD	Stroke	Other circulatory	Endocrine	Cancer	Respiratory
			Males			
Underlying	87,725	29,516	26,992	12,759	121,118	34,077
Associated	36,931	25,048	99,685	32,703	16,456	45,492
Total	**124,656**	**54,564**	**126,677**	**45,462**	**137,574**	**79,569**
% underlying	70.4	54.1	21.3	28.1	88.0	42.8
			Females			
Underlying	76,458	44,403	31,969	12,539	93,550	28,697
Associated	27,834	25,378	98,502	29,808	10,127	31,363
Total	**104,292**	**69,781**	**130,471**	**42,347**	**103,677**	**60,060**
% underlying	73.3	63.6	24.5	29.6	90.2	47.8

Notes

1. Total: the total number of deaths with the selected disease listed as an underlying or associated cause of death.
2. % underlying: underlying cause of death listings/total listings as percentage.

Source: AIHW National Mortality Database.

Multiple causes of death data also provide some insights into the comorbidities or co-occurrence of diseases. For example, with regard to male deaths in 1997–02, whenever CHD was listed as a cause of death (underlying or associated), CHD itself was the underlying cause in 70.4% of the cases, stroke in 2.6%, other circulatory diseases in 2.7%, endocrine diseases (mainly diabetes) in 5.2%, cancer in 7.5%, respiratory diseases in 4.6%, and all other diseases in 7.0% (Table 2.18). When cancer was listed as a cause of death (underlying or associated) for males, however, CHD was the underlying cause of death in only 4.3% of the cases and stroke in only 1.4%.

Table 2.18: Comorbidities at the time of death, 1997–02 (as per cent of deaths listing selected cause of death)

	Underlying or associated causes					
Underlying cause	**CHD**	**Stroke**	**Other circulatory**	**Endocrine**	**Cancer**	**Respiratory**
			Males			
CHD	70.4	12.3	32.8	23.6	4.3	4.2
Stroke	2.6	54.1	5.4	6.4	1.4	5.3
Other circulatory	2.7	5.9	21.3	5.0	1.3	3.4
Endocrine	5.2	4.7	4.2	28.0	0.6	0.7
Cancer	7.5	8.2	13.7	17.7	88.0	15.7
Respiratory	4.6	3.4	8.4	5.3	1.8	42.8
Other	7.0	11.0	14.2	14.0	2.6	27.9
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
			Females			
CHD	73.3	11.1	30.1	22.4	3.0	4.6
Stroke	3.6	63.6	7.7	9.8	1.4	8.9
Other circulatory	2.3	6.3	24.5	6.3	1.3	6.3
Endocrine	5.0	3.8	4.2	29.6	0.5	0.9
Cancer	4.6	4.7	10.4	13.6	90.2	12.4
Respiratory	3.7	1.8	6.5	5.0	1.0	47.8
Other	7.5	8.7	16.6	14.3	2.6	19.1
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: AIHW National Mortality Database.

Trends in mortality

Death rates in Australia have fallen considerably, by almost two-thirds, over the past century. The male age-standardised rate fell by 63%, from 2,234 deaths per 100,000 in the early 1900s to 821 deaths per 100,000 in 2002. The female death rate fell by almost 70% during the corresponding period, from 1,844 deaths to 543 deaths per 100,000 (Figures 2.18 and 2.19). These reductions occurred in several different phases, and were due to a combination of better living conditions, strong public health and safety initiatives, and improved medical treatments.

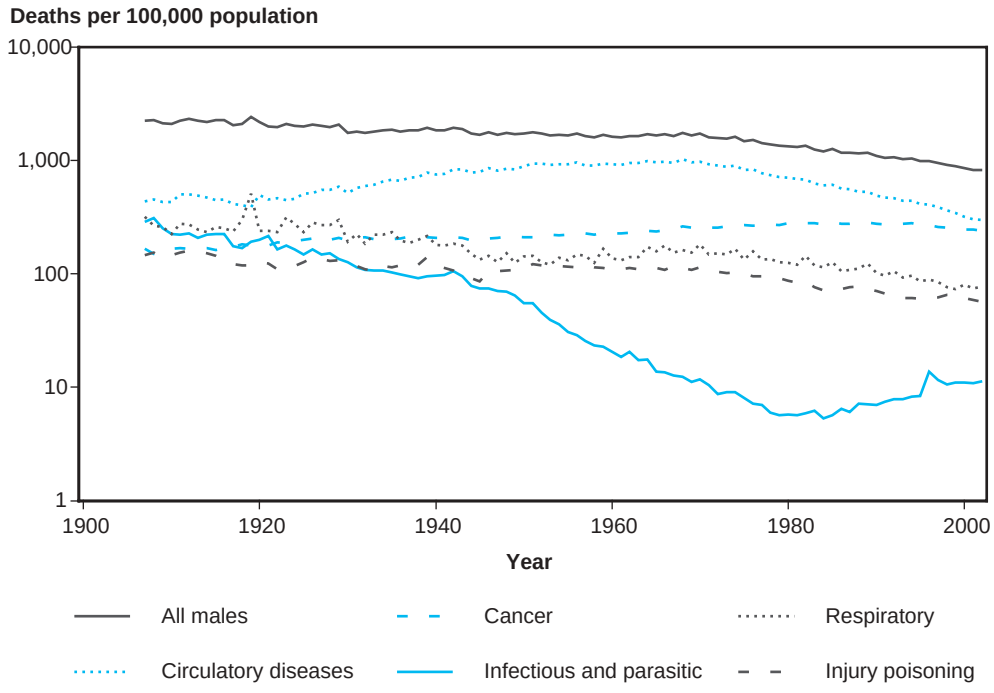
Prominent features of these trends have been large reductions in infant mortality, a significant decline in deaths from communicable diseases, and, over the last four decades, shrinking rates of cardiovascular deaths. Chronic, non-communicable

diseases now have an ever-growing share of these declining rates, with the deaths being increasingly concentrated among older age groups. At the beginning of the 20th century, deaths of children aged less than five years accounted for 26% of all deaths, compared with 1% in 2002. At the start of the 21st century, more than 70% of all male deaths and over 80% of all female deaths occurred among those aged 65 and over.

Mortality trends at ICD chapter level

Long-term trends in cause-specific mortality do not follow the steadily declining slopes noted for all-cause mortality, although by the end of the 20th century all major causes of death had experienced some reductions in rates. The trends fluctuate considerably, particularly among males (Figures 2.18 and 2.19). Age-standardised long-term trends for several major disease groups have shown the following patterns over the past century:

- **Circulatory (cardiovascular) system diseases:** The death rate for males increased from 437 deaths per 100,000 males in 1907 to 1,020 in 1968. Between 1968 and 2002, the rate fell to 297 deaths per 100,000. In females, it increased from 379 deaths per 100,000 females in 1907 to 718 in 1952, before decreasing to 209 in 2002.

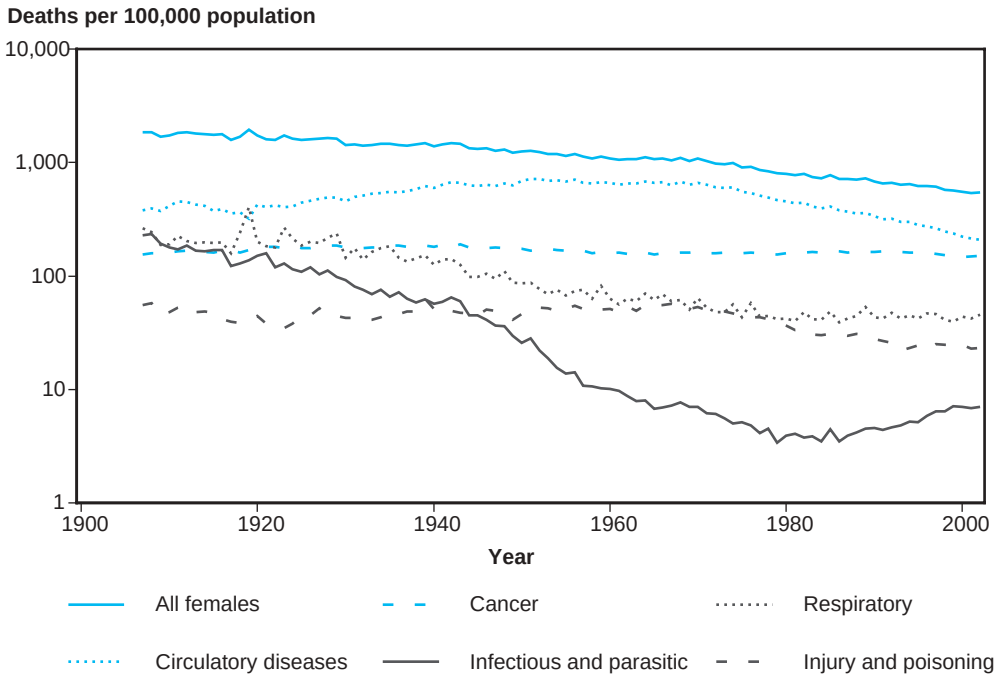


Note: Age-standardised to the Australian population at 30 June 2001. Death rates are presented on a logarithmic scale.

Source: AIHW GRIM books.

Figure 2.18: Trends in major causes of death, males, 1907 to 2002

- **Cancers:** Among males, the overall death rate for cancers increased from 166 deaths per 100,000 males in 1907 to 287 in 1985 before falling to 241 in 2002. Among females, the death rate rose from 154 deaths per 100,000 in 1907 to 190 in 1943. Between 1943 and 2002, the death rate fell to 150, however.
- **Infectious and parasitic diseases:** The death rate in males fell from 288 in 1907 to 5 in 1984, but rose to 11 deaths per 100,000 males by 2002. Similarly, among females the rate fell from 229 in 1907 to 3 in 1979 but stood at 7 deaths per 100,000 females in 2002. This ICD chapter of diseases excludes pneumonia and influenza, currently the largest contributors to communicable disease mortality (see Section 2.7).
- **Respiratory diseases:** In males, the death rate fell from 320 deaths per 100,000 males in 1907 to 77 in 2002, while in females the rate fell from 263 deaths per 100,000 females in 1907 to 45 in 2002. These trends exclude the spikes of 511 deaths per 100,000 males and 405 deaths per 100,000 females resulting from the 1918–19 influenza pandemic.
- **Injuries and poisoning:** The male death rate declined from 147 deaths per 100,000 males in 1907 to 57 in 2002, while among females the rate fell from 263 deaths per 100,000 females in 1907 to 45 in 2002. These declines were interrupted briefly during the third quarter of the last century by an increase in motor vehicle accident deaths.



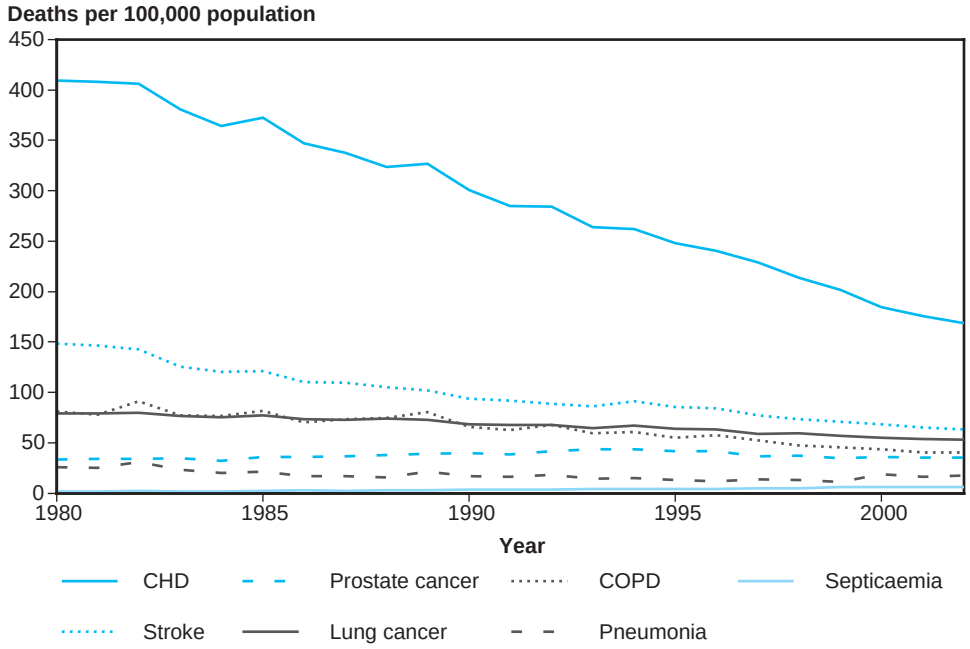
Note: Age-standardised to the Australian population at 30 June 2001. Death rates are presented on a logarithmic scale.
Source: AIHW GRIM Books.

Figure 2.19: Trends in major causes of death, females, 1907 to 2002

Mortality trends for individual diseases

The mortality trends at the ICD chapter level, described above, conceal significant variation at the individual disease level (Figures 2.20 and 2.21). In particular, death rates for different types of cancer vary considerably in trends, a good example of the underlying diversity in trend patterns.

This is because cancer is not a single disease but a collection of many disorders that all feature uncontrolled cell growth. Death rates for cancers such as melanoma, brain cancer, non-Hodgkin's lymphoma and leukaemia have increased in both sexes since the mid-20th century (flattening towards the end of the century), while the death rates for colorectal cancer have been declining in females since the 1940s, and in males since the 1980s (AIHW 2003d). Lung cancer death rates have been decreasing for males since the 1980s, while for females they have continued to increase, mirroring the different smoking trends among males and females and the typical 20- to 30-year time lag before lung cancer develops.



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

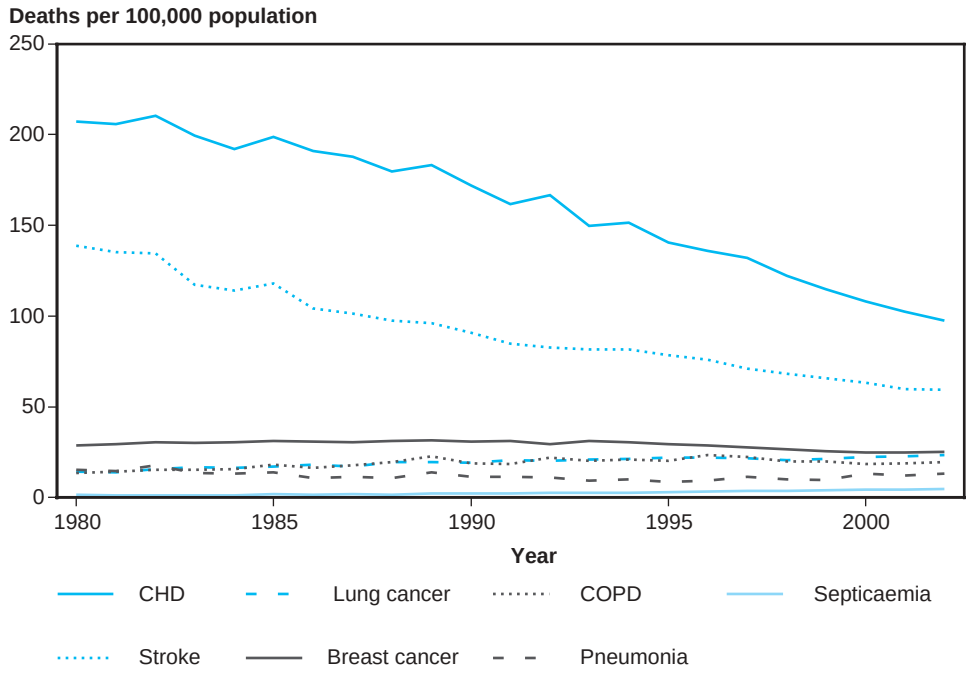
Source: AIHW GRIM Books.

Figure 2.20: Trends in selected causes of death, males, 1980 to 2002

Lung cancer is the leading cause of male cancer deaths, with 53 deaths per 100,000 males in 2002. Between 1940 (when lung cancer was first listed as a specific cause of death) and 1982, the death rate for males increased steadily. Since 1982, however, the rate has been declining consistently. Between 1998 and 2002, the male lung cancer

death rate declined annually by an average of 2.6%. In contrast, the lung cancer death rate among females continued to rise beyond 1982. Since 1998, the death rate for lung cancer in females has risen by 3.2% annually, from 21 to 25 deaths per 100,000 females, becoming the second most common cause of cancer deaths among females.

Death rates for breast cancer, the leading cause of cancer deaths among females, peaked in the early 1940s, having increased slowly since 1921. The rate decreased between 1940 and 1950, and then remained relatively stable until 1993, fluctuating between 28 and 30 deaths per 100,000 females. Since 1998, the breast cancer death rate has fallen annually by 1.4%.



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

Source: AIHW GRIM Books.

Figure 2.21: Trends in selected causes of death, females, 1980 to 2002

Prostate cancer is a major cause of death in older males, with 83% of such deaths occurring among those aged 70 and over. Since 1921, the rate has been increasing slowly. The early 1990s saw a high of 44 prostate cancer deaths per 100,000 males. However, since 1998, the rate has decreased annually by 1.1% to 35 deaths per 100,000 males in 2002.

Colorectal cancer is the third most common cause of cancer deaths in both sexes, with rates of 28 deaths per 100,000 males and 20 deaths per 100,000 females in 2002. These rates have fluctuated considerably in the past, increasing between 1921 to the early

1940s, in both sexes. Among males, the rate continued to climb further to a high of 38 deaths per 100,000 in 1983, but since has declined steadily. Between 1998 and 2002, the colorectal cancer death rate for males declined by 2.8% annually. The death rate in females has been declining over a much longer period, since 1942. Between 1998 and 2002, it declined by an average of 2% annually.

The mortality trends for circulatory (cardiovascular) system diseases have also varied, although CHD and stroke have generally followed the same patterns. CHD was the largest contributor to cardiovascular deaths all through the 20th century, especially in the middle of the century. CHD death rates climbed steadily until 1968, and have declined markedly since then. Between 1998 and 2002, the death rates declined annually by 5.7% in males and 5.5% in females. In 2002, with 170 deaths per 100,000 males and 97 deaths per 100,000 females, CHD was still the most common cause of death in both sexes.

Stroke (cerebrovascular disease) is the second largest individual underlying cause of death, with 63 deaths per 100,000 males and 60 deaths per 100,000 females in 2002. Stroke mortality has declined steadily, with the rates declining annually by 3.7% in males and 3.4% in females between 1998 and 2002.

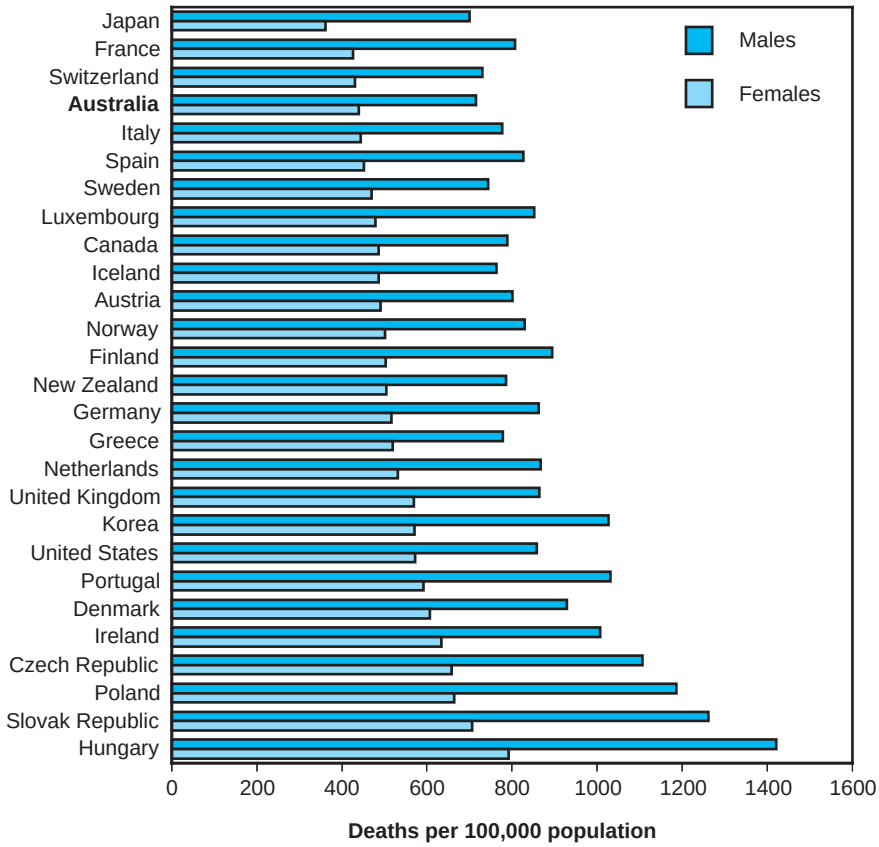
Mortality trends for COPD are broadly similar to those observed for lung cancer, with smoking being the major cause. Septicaemia mortality, on the other hand, has increased from 5.8 to 11.3 deaths per 100,000 males and from 3.9 to 7.0 deaths per 100,000 females between 1980 and 2002. A large proportion (30%) of this increase is attributed to definitional changes between ICD revisions 9 and 10, and the introduction of an automated coding system (AIHW GRIM Books).

The number of deaths due to pneumonia declined considerably, by almost half during the period 1970–86, and then stabilised for a decade. Since the turn of the 21st century, pneumonia deaths have risen again, almost to the levels of the early 1970s. In particular, they increased by almost 50% between the periods 1997–99 and 2000–02.

These variations in mortality trends reflect several interacting influences—the underlying trends in risk factors, the ageing of the population, and the various methods of preventing and treating diseases. There is an apparent paradox in that, although reductions in mortality influence how long people live, age itself becomes a factor in the type of diseases people eventually die of and die with.

International comparisons

At the end of the 20th century, Australia's overall death rate compared well with other OECD countries (Figure 2.22). For males, Australia's age-standardised rate of 714 deaths per 100,000 males ranked the second lowest among OECD countries; and for females, Australia's rate of 440 deaths per 100,000 ranked the fourth lowest. Only Japan had lower overall death rates, with France and Switzerland also having lower female death rates. In contrast, Ireland and the Eastern European countries of Hungary, the Czech and Slovak Republics, and Poland had 40% higher death rates than Australia.



Note: Canada and Iceland 1997, Denmark and New Zealand 1998. Rates age-standardised to the OECD 1980 population.

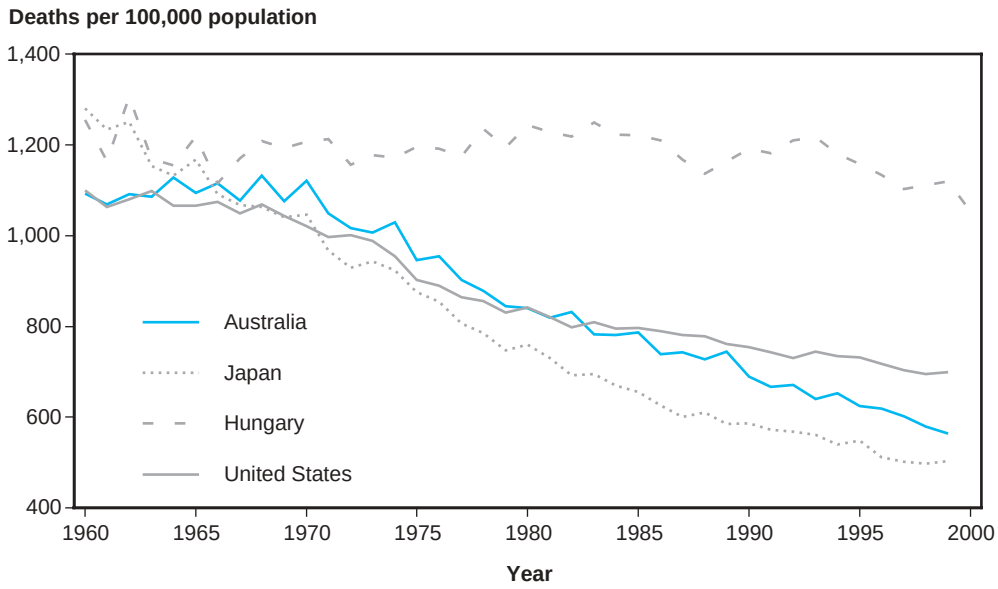
Source: OECD 2003a.

Figure 2.22: All-cause death rates among developed countries, 1999–00

Almost all OECD countries have experienced large declines in mortality in the last several decades. Since 1960, Japan has seen its male death rate decline by 54% and its female death rate by 67% (Figure 2.23). Although from a lower base rate than Japan's in 1960, Australia's decline of 47% among males and 50% among females in the same period is also notable. Other countries with significant declines in death rates include Italy, Finland, France and Germany. The Nordic countries (Denmark, Sweden, Norway and Iceland) experienced more modest declines, but their base rates in 1960 were comparatively low. Death rates in Eastern European countries have begun to decline in more recent years.

During the 1950s and 1960s, death rates in Australia and many other developed countries stabilised. The rates remained steady among children and adults to middle age, although small improvements were noted among older persons. By the mid–1960s and early 1970s, it was considered that the mortality trends had levelled off and that

any further gains would be minimal (AIHW: de Looper & Bhatia 1998). Since then, further declines have occurred at all ages. The pattern was slightly different in Japan, where consistent declines have been seen throughout this period (AIHW: de Looper & Bhatia 1998).



Note: Rates age-standardised to the OECD 1980 population.

Source: OECD 2003a.

Figure 2.23: Trends in all-cause death rates, selected countries, 1960 to 2000

Declines in cardiovascular disease mortality, and in particular CHD, have contributed greatly to recent falls in death rates among many developed countries. CHD is one of the leading causes of mortality for both sexes in developed countries, responsible for between 15–20% of all deaths. Since the 1970s, countries such as Australia, Canada, the United States and Portugal have seen CHD death rates fall by around 60% (OECD 2003b).

At the ICD chapter level, cancer is the second leading cause of death in most OECD countries, accounting for some 20–30% of all deaths. In countries such as Australia, Canada, Ireland, Italy, New Zealand, the United Kingdom and the United States, death rates for cancer peaked in the 1980s and have declined since then. New cases of cancer, however, continue to increase as the population ages.

Much of these reductions in mortality is attributed to changes in lifestyle and public health interventions, reducing known high risk factors such as smoking and high blood pressure, as well as to progress in medical care and improvements in economic and social conditions.

The widespread reductions in death rates, especially for persons in older age groups, hail significant increases in life expectancy at all ages. For example, life expectancy at birth across all OECD countries increased by 8.7 years between 1960 and 2000, from 68.5 to 77.2 years. Premature mortality (that is, death before age 70) has fallen by half in OECD countries since the early 1960s, assisted by the downward trend in infant mortality and declines in deaths from heart disease. Only modest reductions in premature mortality have occurred in some Central and Eastern European countries, due to persistently high mortality from cardiovascular disease and liver disease, particularly cirrhosis. These slow trends reflect continuing higher rates of tobacco and alcohol consumption by males in these countries. In comparison, high rates of premature mortality in the United States are due to deaths from external causes, such as accidents, suicide and homicide (OECD 2003b).

2.6 Non-communicable diseases

The bulk of ill health, disability and premature death in Australia today arises from non-communicable diseases. Prominent among these are cardiovascular diseases, cancers, mental problems and disorders, diabetes, asthma, arthritis, nervous system disorders and kidney diseases. Most of these diseases are chronic (long-term) in nature.

The non-communicable diseases vary considerably in the nature and extent of their community impact. While some diseases are large contributors to premature mortality, others contribute more to disability. Illness associated with these diseases also varies considerably, and the intermittent nature of several diseases makes it somewhat difficult to assess their full impact.

Surveillance and monitoring of diseases has traditionally been disease-specific. Although this approach does not enable an integrated account of these diseases and their risk factors, it persists in light of available data sources.

To generate profiles of individual non-communicable diseases, information has been extracted from a variety of sources, in particular from mortality and hospitalisation data sets, population surveys and other health-related collections. The varying emphasis in the choice and use of information depends upon the nature and progression of the disease. State-based information has been used where national data are not available.

A summary statistic, disability-adjusted life year (DALY), has also been used to describe the burden of disease associated with each major disorder. The DALY statistic takes into account premature mortality caused by a disease, the amount of disability it causes, and its prevalence. DALY is a measure of the years of healthy life lost due to illness or injury—one DALY is one year of 'healthy' life lost. It is a combination of years of life lost due to premature mortality (YLL) and the equivalent years of 'healthy' life lost due to poor health or disability (YLD). The AIHW estimated that the total burden of disease and injury in Australia in 1996 was 2.5 million DALYs, 54% of which were YLL and 46% YLD.

Some of the non-communicable diseases covered in this section receive special attention under the National Health Priority Areas initiative (see the Appendix). The priority areas covered in this section relate to cardiovascular health, cancer control, mental health, diabetes, asthma, and arthritis and musculoskeletal conditions. Several other diseases covered in this section are also significant contributors to the burden of disease in Australia.

Much of the burden of non-communicable diseases is avoidable because several different factors that contribute to their development and progression are highly preventable. It is therefore important that information is also provided on the underlying risk factors for non-communicable diseases. Detailed information on a range of these risk factors is given in Chapter 3. Further information about the impact of non-communicable diseases on different population groups may be found in Chapter 4.

Cardiovascular disease

The term 'cardiovascular disease' (also known as 'circulatory disease' or 'heart, stroke and vascular diseases') covers all diseases and conditions of the heart and blood vessels. Coronary heart disease (CHD), stroke, heart failure and peripheral vascular disease are major contributors to the disease burden among adults. Congenital heart and vascular diseases constitute one of the leading causes of death in the first year of life. Rheumatic fever and chronic rheumatic heart disease are additional major conditions among Aboriginal and Torres Strait Islander peoples.

The main underlying causal mechanism in cardiovascular disease is atherosclerosis, a process marked by abnormal build-ups of fat, cholesterol and other substances in the inner lining of the arteries. It is most serious when it affects the blood supply to the heart (causing angina or heart attack) or to the brain (causing a stroke).

The major, preventable risk factors for cardiovascular disease are tobacco smoking, high blood pressure, high blood cholesterol, insufficient physical activity, overweight and obesity, poor nutrition and diabetes. Atrial fibrillation, transient ischaemic attack and a high intake of alcohol also increase the risk of stroke.

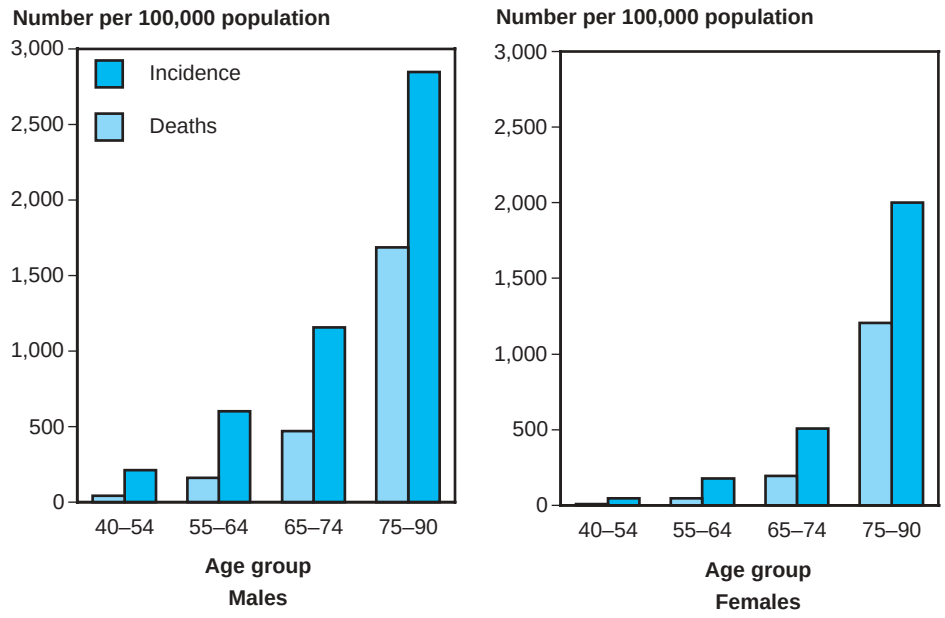
Cardiovascular problems include conditions such as high blood pressure and high blood cholesterol as well as the diseases mentioned above. Together they constitute Australia's leading health issue. About 19.4% of the 2001 National Health Survey respondents, corresponding to 3.7 million Australians, reported cardiovascular problems. They are also one of the leading causes of disability, with around 1.1 million Australians affected by one or more disabling conditions attributed to these problems. Cardiovascular diseases accounted for 50,294 deaths in 2002.

Coronary heart disease

CHD, also known as ischaemic heart disease, is the most common form of heart disease. There are two major clinical forms, heart attack (acute myocardial infarction) and angina. (For further descriptions of atherosclerosis, angina and heart attack, see Glossary.)

In the 2001 National Health Survey, 1.9% of respondents indicated they had CHD, which corresponds to around 355,600 Australians affected. Around three-quarters of this group reported experiencing angina, and around one-third reported having had a heart attack. Based on these self-reports, CHD prevalence was higher among males than females: 2.4% and 1.6%, respectively. Its prevalence increases rapidly with age, from around 4% among 55–64-year-olds to 8% in 65–74-year-olds, and rising to 13% among those aged 75 and over. Almost two-thirds of those reporting CHD were aged 65 and over.

It is difficult to estimate the incidence of coronary heart disease. However, Jamrozik et al. (2001) have developed a method for determining the incidence from mortality and non-fatal hospitalisation episodes. Using this method, about 48,700 coronary events (either heart attack or unstable angina) are estimated to have occurred in Australia in 2001–02 among 40–90-year-olds. Slightly less than one-half of these events (22,400 cases) proved fatal. The estimated incidence among males was twice the rate among females (Figure 2.24).



Note: For comparability purposes, deaths have been averaged over 2001 and 2002.

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

Figure 2.24: Coronary heart disease incidence and mortality, 40–90-year-olds, 2001–02

The estimated incidence of coronary events has declined considerably over the last several years, falling by around a quarter between 1993–94 and 2001–02. The proportion of fatal events is also on the decline.

In the 1998 Disability, Ageing and Carers Survey, 1.2% of the respondents reported one or more disabling conditions associated with CHD. This corresponds to about 224,400 Australians. Of these, 59% needed assistance or had difficulties with self-care, mobility or communication, and another 31% had no difficulty with these activities but used aids or equipment because of their disability.

CHD is the largest single cause of death in Australia, accounting for 26,063 deaths (19% of all deaths) in 2002. Acute myocardial infarction (heart attack) accounted for 55% of these deaths. CHD deaths increase in frequency dramatically with age, with

around 72% of all these deaths occurring among those aged 75 and over, compared with around 5% among those aged under 55. The male death rate in 2002 was almost twice as high as the female rate.

Stroke

Stroke (cerebrovascular disease) occurs when a blood vessel to the brain is suddenly blocked or bleeds. This may result in part of the brain dying due to the lack of blood, leading to a loss of brain function or impairment in any or all of a range of activities including movement, vision, planning, communication and swallowing. Blockage is the most common cause of stroke and there can also be temporary strokes (where symptoms disappear within 24 hours) known as transient ischaemic attacks.

An estimated 1% of respondents to the 2001 National Health Survey, corresponding to about 217,500 Australians, reported that they had had a stroke sometime in their lives. The prevalence was higher among males than females: 1.4% versus 1.0%. Less than one out of five who reported a stroke was younger than 55.

An estimated 40,000 to 48,000 stroke events occur in Australia every year—one every 11–13 minutes. The majority of these, around 70%, are first-ever strokes (AIHW 2004). More females than males have a stroke; however, the age-standardised incidence is higher among males as they tend to have a stroke at younger ages.

Stroke is a large cause of disability. Based on self-reports from the 1998 Disability, Ageing and Carers Survey, 1.2% of respondents (corresponding to 230,300 Australians affected) had one or more disabling conditions associated with stroke. Over three-quarters of these persons needed assistance or had difficulties with self-care, mobility or communication; another 19% had no difficulties with these activities but used aids or equipment. People disabled by a stroke are twice as likely to need ongoing assistance with these activities in comparison to those whose disability is caused by CHD (42% compared with 22% in 1998).

Stroke accounted for 12,533 deaths (9% of all deaths) in 2002. Most of the stroke deaths (82%) occur among those aged 75 and over. More females than males (7,564 compared with 4,969) died of stroke. However, the age-standardised death rate was slightly higher among males, reflecting high fatality among males in younger age groups.

Heart failure

Heart failure occurs when the heart functions less effectively in pumping blood around the body. It can result from a variety of diseases and conditions that impair or overload the heart, notably heart attack, high blood pressure or a damaged heart valve. People with mild heart failure may have few symptoms but in more severe cases it can result in chronic tiredness, reduced capacity to undertake physical activity and shortness of breath.

There are no national data on the incidence or prevalence of heart failure in Australia. Based on overseas findings, however, it is estimated that at least 300,000 Australians aged 45 and over have some degree of chronic heart failure (about 4% of the population), with around 30,000 new cases diagnosed each year (AIHW: Field 2003).

Heart failure accounted for 2,729 deaths in 2002, with 90% of these occurring among people aged 75 and over. More females than males (1,696 compared with 1,033) died of heart failure, but the death rate among males was higher than in females in the younger age groups. Heart failure is more likely to be listed on death certificates as an associated cause of death than as the underlying cause. It is listed more frequently as an associated cause when the underlying cause of death is renal failure (29% of deaths), CHD (24%), diabetes (19%) or chronic lower respiratory disease (17%).

Acute rheumatic fever and chronic rheumatic heart disease

Acute rheumatic fever is a delayed complication of untreated throat infection with Group A streptococcus bacteria, but may also follow streptococcal skin sores. The condition frequently includes fever, joint pain and swelling, and skin rashes. The infection and illness occur mainly in children and young adults, and may affect the heart valves, the heart muscle and its lining (leading to rheumatic heart disease), the joints and the brain. Recurrences of rheumatic fever may lead to cumulative heart damage but can be prevented by strict follow-up.

Indigenous Australians have one of the highest levels of rheumatic fever and rheumatic heart disease in the world (AIHW: Field forthcoming). Two registers of people with known or suspected cases of rheumatic fever and rheumatic heart disease operate in the Top End of the Northern Territory and in Central Australia to capture the nature and extent of the problem.

In 2002, there were 58 registrations of people with acute rheumatic fever in the Top End of the Northern Territory and 27 in Central Australia—all Aboriginal and Torres Strait Islander peoples. In the Top End, most of the cases (83%) required hospitalisation and 35% were recurrences; in Central Australia 30% were recurrences. Children aged 5–14 accounted for around 55% of all cases of acute rheumatic fever (Table 2.19).

On the two registers in 2002, there were 696 people with chronic rheumatic heart disease in the Top End of the Northern Territory and 283 people in Central Australia. Almost all (92–94%) of these were Aboriginal or Torres Strait Islander peoples. In the Top End of the Northern Territory, 92% of those registered with the disease were aged 15 and over; in Central Australia over two-thirds of cases occured in the 15–44 age group.

Acute rheumatic fever and chronic rheumatic heart disease accounted for 274 deaths in 2002. The death rate was almost twice as high among females as in males. Around 73% of deaths occurred in those aged 65 and above.

Table 2.19: Incidence of acute rheumatic fever and prevalence of chronic rheumatic heart disease, selected regions, 2002

	Acute rheumatic fever (5–14-year-olds)		Chronic rheumatic heart disease (all ages)	
Region	Incidence	Incidence rate (per 100,000 population)	Number	Prevalence rate (per 100,000 population)
Top End of the Northern Territory	32	346	696	17
Central Australia	15	365	283	13

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

Health service use

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

GP visits

Cardiovascular diseases and conditions constitute one of the most common problems treated by GPs, accounting for 11% of all problems seen in general practice in 2002–03 (AIHW: Britt et al. 2003). Overall, GPs managed cardiovascular problems at 16 per 100 encounters. High blood pressure was the most frequently managed problem, at a rate of 8.9 per 100 encounters, accounting for over half of all cardiovascular problems managed. Lipid disorders (abnormal levels of cholesterol or related substances in the blood) were managed at a rate of 3.0 per 100 encounters. Other relatively common cardiovascular problems managed by GPs were CHD, cardiac check-ups, heart failure, and atrial fibrillation or flutter. For 62% of encounters for cardiovascular problems, at least one medication was prescribed, advised or given in 1998–00. At least one non-pharmacological treatment (mainly advice and counselling) was also provided by GPs in 16% of these encounters.

Hospitalisation

Cardiovascular disease was the principal diagnosis for 441,002 hospital separations (7% of all separations) in 2001–02. Of these, 36% were due to CHD, 12% to heart rhythm disorders, 9% to heart failure, 9% to stroke, 6% to peripheral vascular disease and 0.5% due to acute rheumatic fever and chronic rheumatic heart diseases. When both principal and additional diagnoses were considered, cardiovascular disease was listed in 10% of all hospital separations.

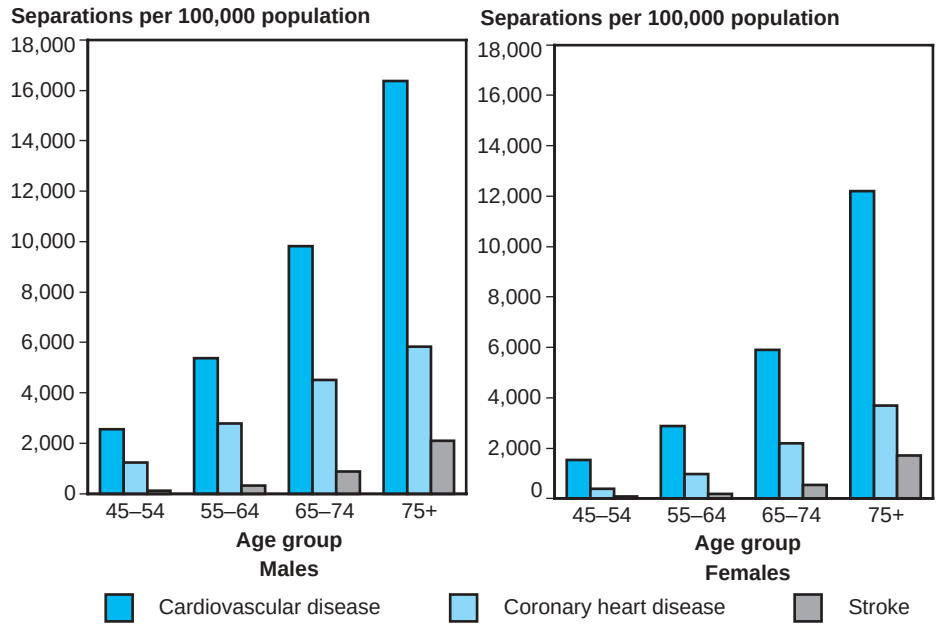
Males were more likely to be hospitalised for cardiovascular disease than females, with male CHD and peripheral vascular disease separation rates being twice as high. Hospitalisation for cardiovascular disease increases rapidly with age, with those aged 55 and above accounting for 77% of separations (Figure 2.25).

For those hospitalised for at least one night in 2001–02, the average length of stay was 8.1 days, a substantial reduction from 9.8 days in 1993–94. The average length of stay for stroke, peripheral vascular disease, rheumatic fever and rheumatic heart disease was at least twice as long as that for CHD. Females had a longer average length of stay than males.

Treatment and procedures

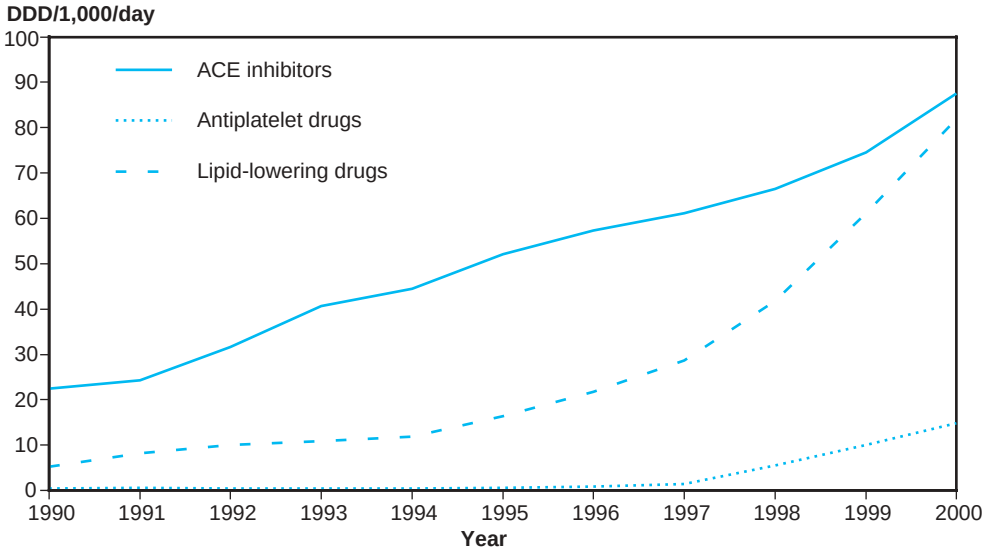
Drug treatment

The range and quality of drugs available for preventing or treating cardiovascular disease have improved considerably over the last 10 to 15 years. The use of blood cholesterol-lowering drugs almost quadrupled between 1996 and 2000, and they are now one of the most widely dispensed drug types. Similarly, angiotensin-converting enzyme (ACE) inhibitors, used to treat people with high blood pressure or heart failure, have become one of the most popular classes of blood pressure-lowering drugs. Their use has increased steadily, by 53% over the same period. The use of antiplatelet drugs such as aspirin, which reduce the formation of blood clots, has also risen markedly (Figure 2.26).



Source: AIHW National Hospital Morbidity Database.

Figure 2.25: Hospital separations for cardiovascular disease, ages 45 and over, 2001–02



Note: DDD = defined daily dose; ACE = angiotensin-converting enzyme.

Source: DoHA 2003.

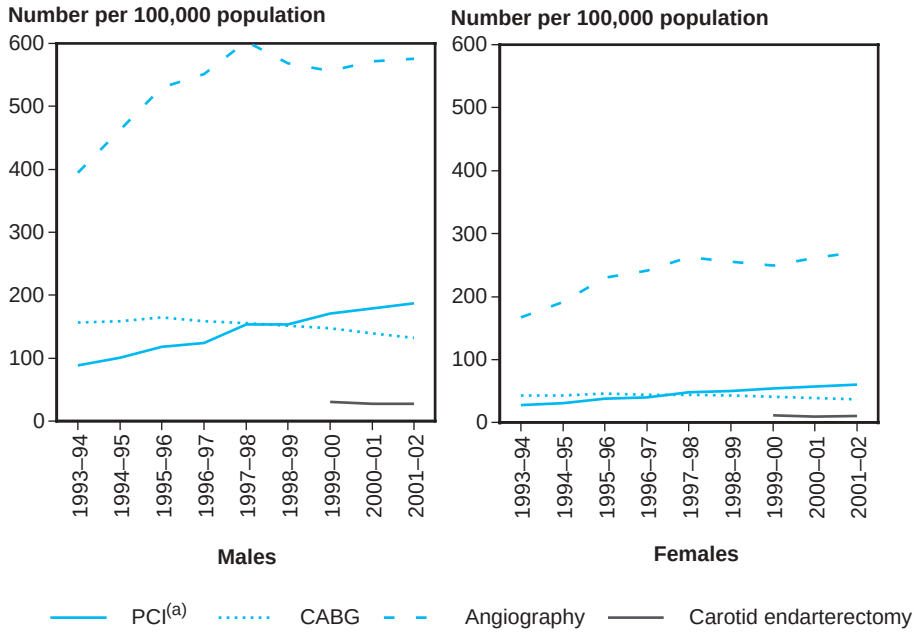
Figure 2.26: Trends in use of major cardiovascular drugs, 1990 to 2000

Cardiovascular procedures

Data on the procedures to diagnose and treat people with cardiovascular disease indicate an increasing uptake of important technologies and methods. Prominent among these are coronary angiography (taking an x-ray of the heart's arteries), revascularisation procedures to remove or bypass blockages in coronary arteries, such as coronary angioplasty and coronary artery bypass grafting (CABG), and carotid endarterectomy (which entails surgically removing plaques from the carotid arteries in the neck that supply blood to the brain).

In 2001–02, 81,926 coronary angiograms and 23,982 coronary angioplasties were performed. Coronary stents (metal mesh tubes that are expanded within the narrowed part of an artery to hold it open) were inserted in 91% of angioplasty procedures. In addition, 16,275 CABG procedures were undertaken in 2001–02. A total of 3,558 carotid endarterectomies were also performed during that year, with the vast majority performed on persons hospitalised for stroke.

Over the period 1993–94 to 2001–02, the use of coronary angioplasty and coronary stenting has doubled. In comparison, the number of CABG procedures declined by 16% among males and 13% among females (Figure 2.27).



Notes

1. PCI = percutaneous coronary intervention (angioplasty and stents).
2. CABG = coronary artery bypass grafting.
3. Age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Hospital Morbidity Database.

Figure 2.27: Trends in cardiovascular procedures, 1993–94 to 2001–02

The cardiovascular health of Australians has improved considerably in recent years with substantial and continuing falls in death rates, reduction in the levels of certain risk factors, and major advances in treatment and care. Much of existing cardiovascular disease is potentially preventable through changes in physical activity, tobacco smoking, overweight and obesity, nutrition and alcohol consumption (see Chapter 3 for further discussion).

Cardiovascular disease burden

Cardiovascular disease was estimated to account for 22% of the disease burden in Australia in 1996, 33% of years of life lost due to premature mortality and 9% of years of 'healthy' life lost due to poor health or disability (AIHW: Mathers et al. 1999).

Cancer

Cancer is a diverse group of diseases in which some of the body's cells become defective, begin to multiply out of control, can invade and damage the tissue around them, and may also spread (metastasise) to other parts of the body to cause further damage. This section describes the incidence and mortality of cancer in Australia, discusses some of the risk factors for developing cancer, and describes the ages at which cancer is commonly diagnosed. Some international comparisons of cancer incidence and mortality are also provided.

Incidence

Information on new cases of cancer is collected by state and territory cancer registries, and compiled by the National Cancer Statistics Clearing House (see Box 2.5). Data for cancer incidence are currently available to the year 2000 and mortality data to 2002.

Box 2.5: Cancer surveillance and monitoring in Australia

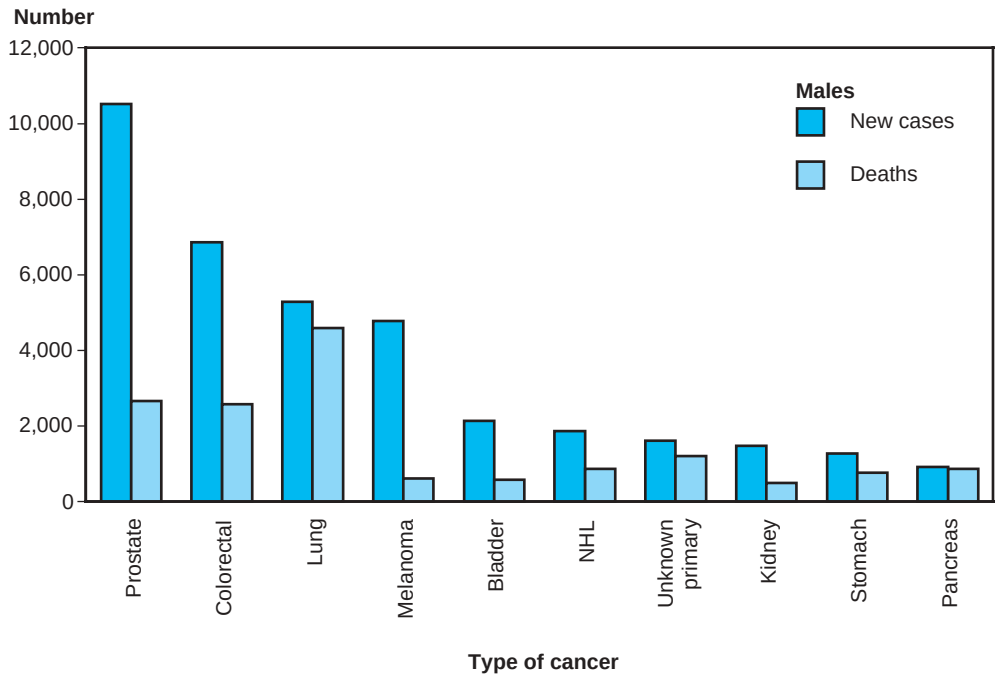
The registration of cancer is required by law in each of the states and territories, usually under the Public Health Acts, where the data are collated by cancer registries. These registries collect clinical and demographic information about people with newly diagnosed cancer from hospitals, pathologists, radiation oncologists (cancer specialists), cancer treatment centres and nursing homes.

Agreement was reached in 1990 for all state and territory cancer registries to supply records of all new cases of cancer from 1982 onwards, excluding non-melanoma skin cancer, to the National Cancer Statistics Clearing House (NCSCH). The NCSCH is operated by the AIHW under the supervision of the Australasian Association of Cancer Registries (AACR). Both the AIHW Act and Commonwealth privacy law provide for the protection of confidentiality of records supplied to the clearing house. In addition to generating national statistics, the NCSCH enables data to be released to researchers after a strict scientific and ethical review process that involves the AACR Executive, the AIHW Ethics Committee, and state and territory cancer registries.

It has been estimated that approximately 459,000 new cases of cancer were diagnosed in Australia in 2000, a large proportion of which, about 374,000, were non-melanoma skin cancers (NMSC). If treated early, NMSC are much less life-threatening than other cancers. Most of the registries in Australia do not keep details of NMSC as the cases are not confirmed by histology or are not reported; these skin cancers are often self-detected and usually removed in a doctor's surgery.

Excluding NMSC, there were 45,935 new cases of cancers in males and 39,296 in females, with age-standardised rates of 536 per 100,000 males and 297 per 100,000 females. If the current age-specific incidence continues to apply, then one in three male and one in four female Australians are expected to be diagnosed with cancer in the first 75 years of their life (AIHW & AACR 2003).

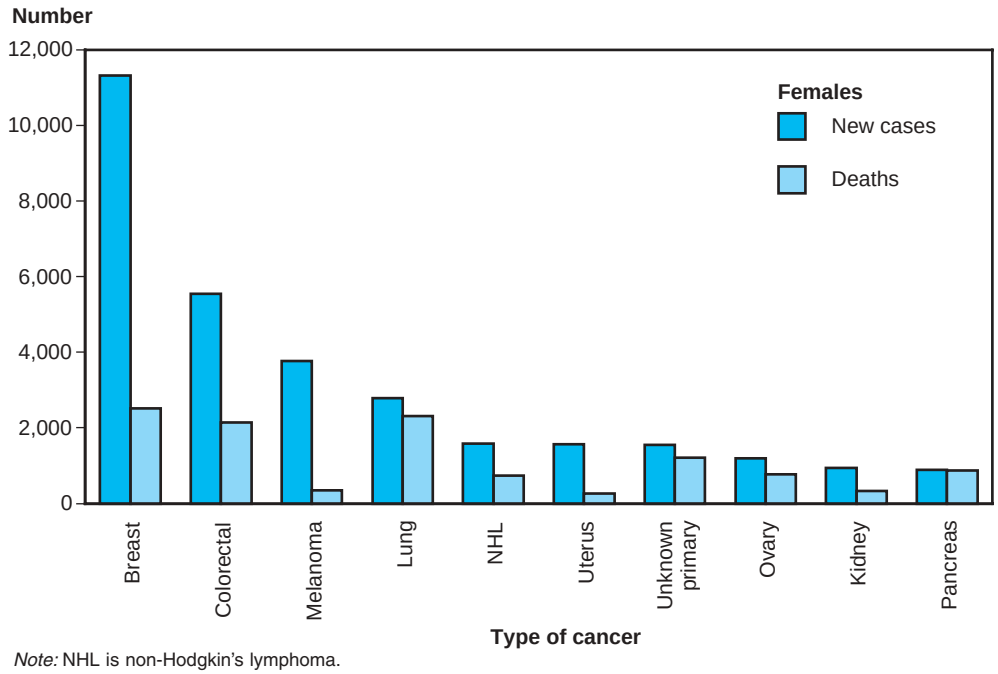
Prostate cancer was the most common registered cancer in males, with 10,512 cases diagnosed in 2000, followed by colorectal (bowel) cancer (6,863), lung cancer (5,278) and melanoma (4,770). Together, the four cancers accounted for 60% of all newly registered cancers in males (Figure 2.28). In females, breast cancer (11,314 cases) was the most commonly registered cancer in 2000, followed by colorectal cancer (5,542), melanoma (3,761) and lung cancer (2,782), these four again accounting for 60% of all newly registered cancers (Figure 2.29).



Note: NHL is non-Hodgkin's lymphoma.

Source: AIHW & AACR 2003.

Figure 2.28: Number of new cases and cancer deaths, males, 2000



Note: NHL is non-Hodgkin's lymphoma.

Source: AIHW & AACR 2003.

Figure 2.29: Number of new cases and cancer deaths, females, 2000

The incidence of all cancers combined (except NMSC) increased among males by an average of 4.4% per year between 1990 and 1994, and then declined by an average of 2.1% per year to 2000. Among females, the incidence increased by an annual average of 1.9% until 1995, and then fluctuated around that level through to 2000.

Cancers in males that increased in incidence between 1990 and 2000 include melanoma (2.4% per year on average), testis (2.3%), kidney (1.8%) and prostate (0.4%). The incidence of prostate cancer rose dramatically between 1990 and 1994, due mainly to increased detection by prostate-specific antigen testing, followed by a sharp fall until 1998, after which the incidence levelled off. Lung cancer, on the other hand, has declined in incidence since 1990, with an average annual decline of 1.9% for the period 1990 to 2000. Other cancers in males recording declines during that period were stomach (2.2% per year on average), unknown primary (2.0%) and pancreas (0.5%).

Among females, the cancers showing an increase in incidence between 1990 and 2000 were breast cancer (1.7% per year on average), non-Hodgkin's lymphoma (1.7%), and cancers of the lung (1.3%) and kidney (1.2%). On the other hand, cervical cancer (5.7% per year on average) and stomach cancer (3.2%) declined in incidence.

Changes in the incidence of cervical cancer can be attributed to the National Cervical Screening Program introduced in the early 1990s. This program has achieved detection and treatment of pre-cancerous cervical conditions in many women, reducing the numbers of those who go on to develop cancer.

Age at first diagnosis of cancer

The average age of first diagnosis for cancer is 66 years in males and 64 years in females. However, cancer is not a disease of older ages only; 0.7% of all cancers occur in children aged under 15.

The average age of first diagnosis of cancer increased by one year in both sexes, from 65 to 66 years in males and from 63 to 64 years in females, during the decade 1990 to 2000. The corresponding median age at first diagnosis also increased from 67 to 69 years in males but stayed at 65 years in females.

New cases of cancer in Australia are increasing faster than projected from the underlying population growth. There was a 36% increase in new cases, compared with a 12% increase in the size of the Australian population, between 1990 and 2000. Much of this discrepancy is explained by the ageing of the population; screening and early diagnosis have also contributed to the increase.

In 2000, individual cancers showed much variation in the average age of first diagnosis, from 59 years for melanoma to 71 years for prostate among males, and from 53 years for cancer of the cervix to 74 years for cancer of the pancreas among females (Table 2.20).

Table 2.20: Average age at first diagnosis, selected cancers, 1990 and 2000

	Males		Females	
Cancer site	**1990**	**2000**	**1990**	**2000**
Cervix	. .	. .	50	53
Melanoma	56	59	54	56
Breast	66	66	60	60
Ovary	. .	. .	62	63
Uterus	. .	. .	65	64
Non-Hodgkin's lymphoma	60	62	64	66
Kidney	64	64	65	67
Lung	68	70	67	69
Colorectal	67	68	68	70
Stomach	68	69	71	70
Bladder	69	71	69	73
Pancreas	69	69	72	74
Unknown primary	68	70	71	74
Prostate	73	71	. .	. .
All cancers[(a)]	**67**	**68**	**68**	**70**

. . Not applicable.

(a) Excludes non-melanoma skin cancer.

Source: National Cancer Statistics Clearing House.

Mortality from cancer

In 2002, there were 21,041 male and 16,581 female deaths from cancer (by year of registration), with age-standardised rates of 241 per 100,000 males and 150 per 100,000 females. Lung cancer accounted for 22.0% of all cancer deaths among males, followed by prostate cancer (13.3%) and colorectal cancer (11.4%). Breast cancer (16.0%) was the leading cause of cancer deaths in females, followed by lung cancer (15.0%) and colorectal cancer (13.0%).

Older people now make up a higher proportion of those dying from cancer. In 1983, approximately 31% of all cancer deaths occurred in persons aged 75 and above, but by 2002 this proportion had increased to 47%.

Between 1992 and 2002, total cancer death rates declined among both males and females by an annual average of 1.4% and 0.7% respectively. These reductions may be attributed to improvements in earlier detection and treatment of many cancers, the effect of screening programs, and a decline in the prevalence of smoking. For cervical and breast cancers, the cancers for which there are national screening programs, the declines in average annual mortality in that period were 5.7% and 1.6% per year respectively.

Cancer as an additional cause of death

The statistics above are based on data where cancer is recorded on death certificates as the underlying cause of death. However, the presence and development of cancer can also raise a person's risk of death from other causes.

A cancer was listed on 42,448 death certificates in 2002. Of these, it was the underlying cause in 37,622 (88.6%) deaths. In 4,826 deaths, the person had cancer but it was not the underlying cause of death. Cancer was listed as an additional cause of death most often with coronary heart disease, stroke and chronic obstructive pulmonary disease.

Risk factors for cancer

Numerous factors increase a person's risk of cancer and statistics relating to two important causes are given below.

Tobacco smoking

Cigarette smoking is estimated to have directly caused 10,807 new cases of cancer (57.2 per 100,000 persons) and 7,650 deaths (40.5 per 100,000 persons) in 2000 (AIHW & AACR 2003). Cancers attributable to smoking are estimated to account for 16.8% of all new cases in males and 7.9% of all new cases in females. This difference is mainly due to higher rates of smoking among males over the last several decades.

Between 1990 and 2000, the incidence of smoking-related cancers among males fell by an annual average of 1.4%, while the rate among females rose by 0.7%. Over the same period, the death rate for these cancers fell among males (1.9% per year) but rose among females (2.9% per year).

If the 1990 death rates attributable to smoking were applied, there would have been an additional 2,093 male cancer deaths in 2000 due to smoking. This illustrates the reduction in cancer mortality achieved by the declines in tobacco smoking among males. In contrast, the cancer deaths attributable to smoking have increased among females since 1990; there would have been 498 fewer deaths in 2000 if the 1990 rates applied (AIHW & AACR 2003). These trends reflect the dominant position of lung cancer in smoking-related cancers, the decades-long time lag between the starting of smoking and the onset of lung cancer, and the fact that female smoking rates began declining after those in males.

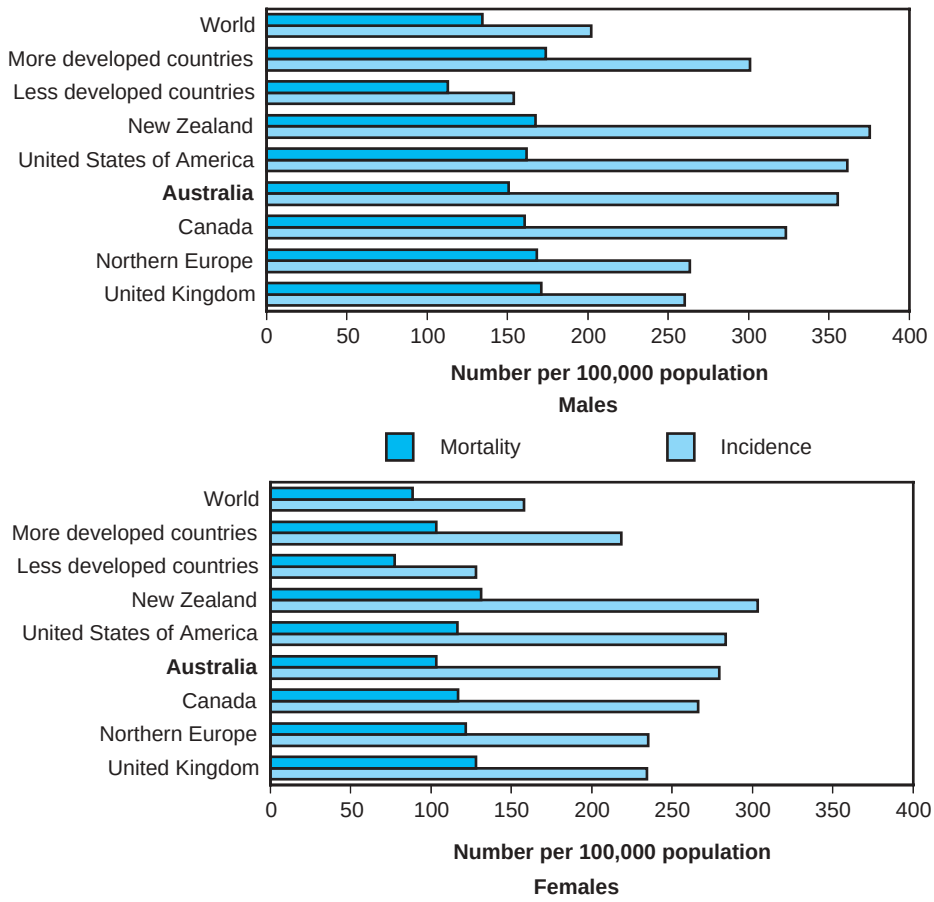
Alcohol consumption

Alcohol is another major factor in the development of certain forms of cancer. In 2000, 2,697 new cases of cancer were directly attributable to alcohol consumption, at a rate of 14.3 per 100,000 persons. Alcohol consumption was also responsible for 1,227 deaths, at

a rate of 6.5 per 100,000 persons. The lifetime risk of cancers attributable to alcohol is 1 in 94 for males and 1 in 76 for females. Between 1990 and 2000, the incidence of cancers attributable to alcohol consumption in females increased by an average of 1.5% per year, but the male rate decreased by an average of 0.2% per year.

International comparisons

Australia has the fourth highest cancer incidence in males, behind Hungary, New Zealand and the United States of America; and in females, behind New Zealand, Denmark and the United States of America (IARC 2001). However, Australia's cancer death rates rank lower than its incidence; Australia is 46th out of 173 countries for males and 58th for females. Figure 2.30 presents a comparison of Australian cancer incidence and death rates with selected regions and countries.



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

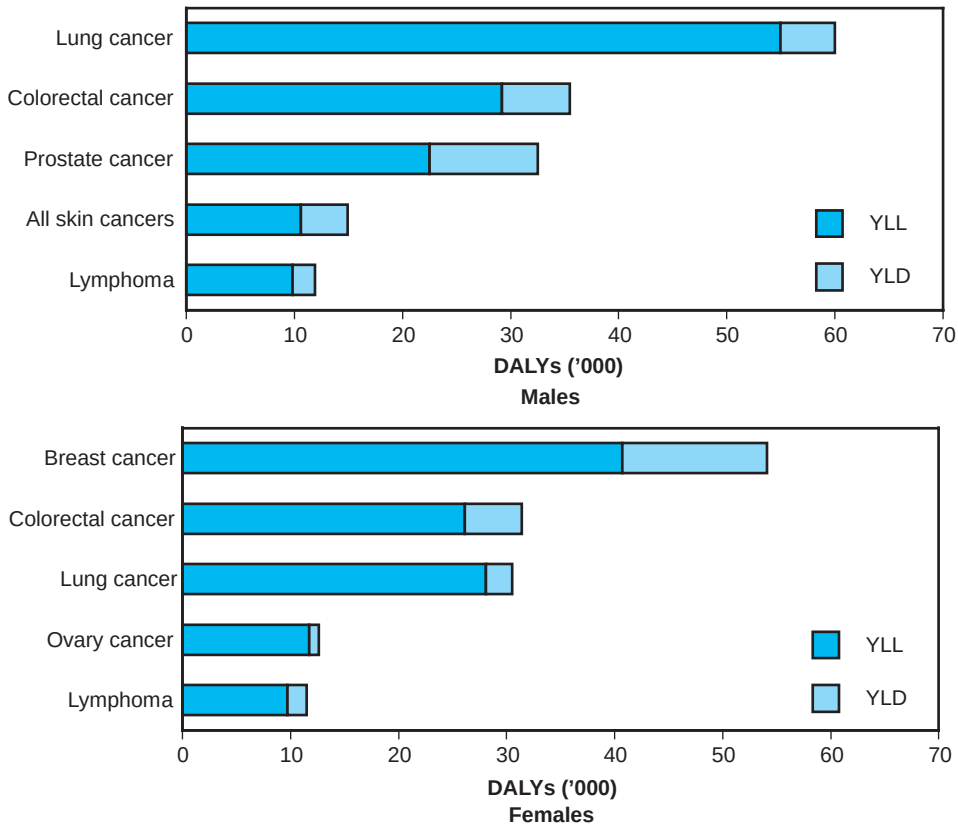
Source: IARC 2001.

Figure 2.30: International comparisons of incidence and death rates for all cancers (excluding non-melanoma skin cancers)

Australia has high incidences of some cancers by world standards. It has the highest incidence of melanoma among males and the second highest (after New Zealand) among females. The majority of these cases can be attributed to excessive exposure to the sun.

Cancer burden

Cancers were estimated to account for 19% of the disease burden in Australia in 1996, 30% of years of life lost due to premature mortality (YLL) and 7% of years of 'healthy' life lost due to poor health or disability (YLD) (AIHW: Mathers et al. 1999). DALYs for the top five cancers in 1996 are presented in Figure 2.31. Together, the top five cancers accounted for 61% of the cancer burden in males and 62% among females.



Note: YLL is years of life lost due to premature mortality; YLD is years of 'healthy' life lost due to disability.

Source: AIHW: Mathers et al. 1999.

Figure 2.31: Disease burden (DALY) associated with the top five cancers, 1996

Lung cancer was the leading contributor to the cancer burden in males in 1996, accounting for 24% of DALYs in males, followed by colorectal cancer (14%), prostate cancer (13%), skin cancer (melanoma and non-melanoma skin cancer—6%) and lymphoma (5%). The burden associated with lung cancer was primarily through YLL, reflecting both the high case

fatality rate and short survival time. In contrast, the burden associated with prostate cancer has a high component (around one-third) of YLD, reflecting the slow progression of the disease and the general loss of wellbeing over long periods.

Breast cancer constitutes the leading cause of cancer burden among females, accounting for 24% of that burden in 1996. Colorectal cancer (14%), lung cancer (13%), cancer of the ovary (6%) and lymphoma (5%) were other major contributors. As with males, the burden associated with lung cancer in females is mainly due to YLL. In contrast, YLD comprises around one-quarter of the burden associated with breast cancer. This again reflects the longer average time gap between diagnosis and death, and the loss of wellbeing associated with the treatment of breast cancer.

Mental health problems and disorders

Mental health problems and disorders range from short-term anxiety and depression to longer term conditions such as chronic depression and schizophrenia.

Mental ill health is one of the leading causes of non-fatal burden of disease and injury in Australia, and is associated with increased exposure to health risk factors, poorer physical health, and higher rates of death from many causes including suicide.

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

Prevalence

The prevalence of mental disorders in adults can be reported using a range of different measures. The most commonly quoted figure is that one in five Australian adults will experience a mental illness at some time in their life. This figure is from the adult component of the National Survey of Mental Health and Wellbeing, conducted in 1997 by the ABS. Approximately 10,600 people aged 18 and above participated in the survey. An estimated 18% of Australian adults had experienced a mental disorder in the 12 months before the interview (ABS 1998). The prevalence of mental disorders decreased with age, with the highest prevalence reported for adults aged 18–24 (27%), reflecting a relatively high rate of substance use disorders. The prevalence was lowest, at 6%, for those aged 65 and above.

The 2001 National Health Survey provides the latest estimates of the prevalence of mental health conditions in Australia (Table 2.21). Unlike the 1997 Survey of Mental Health and Wellbeing, which used a computerised version of the Composite International Diagnostic Interview for diagnosis, the National Health Survey estimates are based on self-reports.

Almost 9.6% of respondents (equivalent to 1,812,600 Australians) reported a long-term mental or behavioural problem (ABS 2004). Mood (affective) and anxiety problems were the most commonly reported concerns (each affecting approximately 4.5% of the population). In both cases, more females (5.5%) than males (3.4%) reported these problems.

A person may also exhibit psychological distress with or without mental and behavioural problems. The 2001 National Health Survey measured such distress using

the Kessler Psychological Distress Scale. Very high (3.6%) or high (9.0%) levels of current psychological distress were recorded by 12.6% of respondents. About 1.7% of the adult respondents without mental and behavioural problems recorded very high levels of psychological distress (indicating a need for professional assistance); a further 6.6% recorded high levels. In total, about 18% of adult respondents reported a mental or behavioural problem and/or had a very high or high level of psychological distress, with 12% reporting both a mental or behavioural problem and a very high level of psychological distress.

Table 2.21: Prevalence of mental and behavioural problems, and psychological distress, 2001 (per cent of age and sex group)

Age group (years)	Mental and behavioural problems			Level of psychological distress					
				Very high			High		
	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons
0–17	8.0	6.0	7.0	. .[(a)]	. .[(a)]	. .[(a)]	. .[(a)]	. .[(a)]	. .[(a)]
18–24	8.1	14.1	11.0	2.7	5.4	4.1	8.3	16.6	12.4
25–34	8.6	14.2	11.4	2.1	4.6	3.4	8.4	11.2	9.8
35–44	10.0	11.5	10.8	2.5	4.2	3.4	7.8	11.3	9.6
45–54	9.3	13.8	11.6	3.7	5.5	4.6	6.1	10.0	8.0
55–64	9.4	11.4	10.4	3.6	3.6	3.6	6.9	9.3	8.1
65–74	6.8	8.9	7.9	1.9	3.4	2.7	5.8	7.0	6.4
75 and above	5.2	7.2	6.4	1.9	3.0	2.5	4.6	9.1	7.2
All age groups	**8.5**	**10.6**	**9.6**	**2.7**	**4.4**	**3.6**	**7.2**	**10.9**	**9.0**

(a) The Kessler Psychological Distress Scale was administered to adult respondents only.

Source: ABS 2001 National Health Survey.

Comorbidity, involving more than one mental disorder—or at least one mental disorder and one or more physical disorders—is common among the mentally ill. In the National Survey of Mental Health and Wellbeing, approximately one in four persons with an anxiety, affective or substance use disorder also had at least one other mental disorder (Hall et al. 2001). Among persons with psychotic disorders, 30% had a medical history of alcohol abuse or dependence, 25.1% of cannabis abuse and 13.2% of other substance abuse or dependence (Jablensky et al. 1999).

The prevalence of other National Health Priority Area diseases and conditions was higher among persons reporting a long-term mental or behavioural problem than among those without such problems (ABS 2004). The conditions were: diseases of the musculoskeletal system and connective tissue (47.7% compared with 30.4%), diseases of the circulatory system (21.2% compared with 16.4%), asthma (17% compared with 11%), and an injury event in the last month resulting in some remedial health action being taken (16.8% compared with 11.7%). The prevalences of diabetes and cancer were similar in both groups.

Other physical conditions with higher prevalence among those reporting a long-term mental or behavioural problem were: migraine (12.9% compared with 5.5%), bronchitis and emphysema (7.2% compared with 3.1%), and stomach, duodenal or gastrointestinal ulcer (5.6% compared with 2.4%).

Use of health services

Hospital separations

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

There were 284,839 hospital separations with either a mental health-related principal diagnosis or a record of specialised psychiatric care in 2001–02, a rate of 1,458 separations per 100,000 population. These separations accounted for 3,175,747 patient days (Table 2.22). Although comprising 4.5% of all separations, mental health-related separations accounted for 13.6% of total days spent by patients in hospital.

Table 2.22: Mental health-related hospital separations[(a)], 2001–02

ICD-10-AM code	Principal diagnosis	Separations	Patient days
F00–F03	Dementia	6,586	248,183
F04–F09	Other organic mental disorders	4,766	86,385
F10	Mental, behavioural disorders due to alcohol	29,194	150,342
F11–F19	Mental, behavioural disorders due to other psychoactive substances use	13,864	82,708
F20	Schizophrenia	27,813	865,363
F21–F29	Other schizophrenic, schizotypal, delusional disorders	17,731	237,174
F30	Manic episode	1,258	13,192
F31	Bipolar affective disorders	15,943	206,045
F32–F33	Depressive disorders	68,450	452,224
F34–F39	Other mood (affective) disorders	4,379	24,307
F40–F48	Neurotic, stress-related and somatoform disorders	49,415	210,115
F50	Eating disorders	6,003	48,909
F51–F59	Other behavioural syndromes associated with physiological disturbances, physical factors	3,237	15,670
F60–F69	Disorders of adult personality and behaviour	9,201	47,917
F70–F79	Mental retardation	339	28,810
F80–F89	Disorders of psychological development	1,065	6,881
F90–F98	Disorders onset usually occurring in childhood, adolescence	4,910	14,104
F99	Mental disorder not otherwise specified	288	3,950
	Other mental health-related diagnosis[(b)]	13,245	132,047
	Other[(c)]	7,152	301,421
Total		**284,839**	**3,175,747**

(a) Includes separations which reported either specialised psychiatric care days and/or a mental health-related principal diagnosis.

(b) Includes mental health-related diagnoses other than those in the Mental and Behavioural Disorders chapter of IC-10-AM, as detailed in AIHW 2003e.

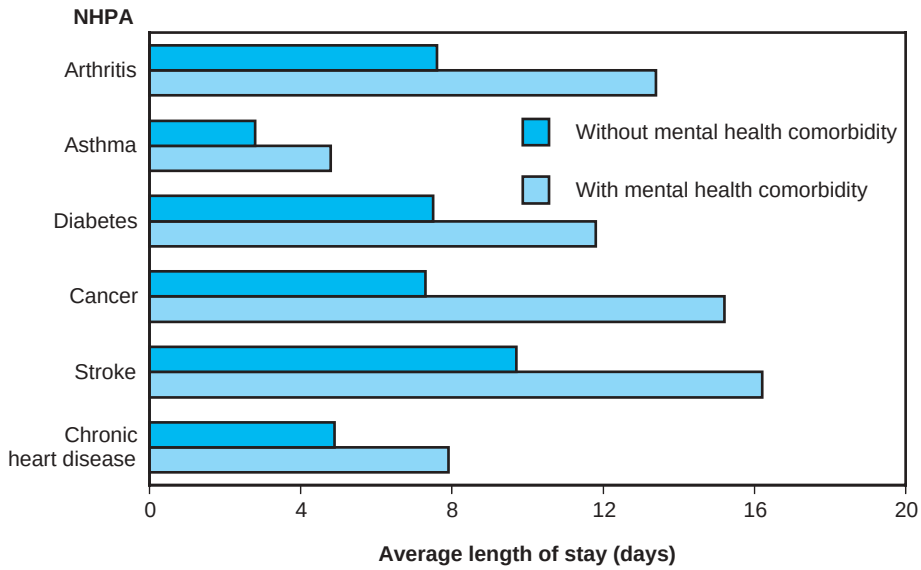
(c) Includes separations for which specialised psychiatric care was provided without a mental health-related principal diagnosis being recorded.

Source: AIHW Hospital Morbidity Database 2001–02.

Principal diagnoses of depressive disorders (24.0%), neurotic and stress-related disorders (17.3%), mental and behavioural disorders due to alcohol (10.2%), and schizophrenia (9.8%) accounted for the largest proportions of mental health-related separations. Schizophrenia accounted for the largest proportion of patient days (30.1%).

In 2001–02, there were a further 263,034 hospital separations for which a mental health-related diagnosis was reported as an additional diagnosis with a non-mental health principal diagnosis. These separations accounted for 2,725,457 patient days.

The average length of overnight stay in hospital for patients with a National Health Priority Area principal diagnosis was higher when there was an additional mental health diagnosis (Figure 2.32).



Source: National Hospital Morbidity Database.

Figure 2.32: Mental health problems as comorbidity in National Health Priority Area (NHPA) hospital separations, 2001–02

GP visits

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

Mental health problems are estimated to have accounted for 10.7% (approximately 10.3 million) of all GP attendances in 2002–03, and constituted the third most common problem group in general practice (353 per 1,000 encounters). Medications related to psychological problems were the fifth most commonly prescribed drugs.

Disability

The prevalence of psychiatric disabling conditions was estimated at 4.1% of the Australian population in 1998, around 768,900 people, based on the 1998 National Survey of Disability, Ageing and Carers (AIHW 2003a). Psychiatric disability is also associated with other disabling conditions. Additional disabilities were reported by 79% of those with a psychiatric disabling condition and by 66% of those whose main disabling condition was psychiatric in nature (AIHW 2003a).

The disabling effects of mental ill health are profound at the severe end of spectrum. Almost half (47%) of the people with psychotic disorders were rated as seriously impaired or worse off in their ability to function in social and occupational domains in the National Survey of Mental Health and Wellbeing (Jablensky et al. 1999). Levels of disability were also higher among those with concurrent mental health problems and disorders (Andrews & Slade 2001).

As at June 2003, there were 166,040 people receiving a disability support pension with a psychological or psychiatric condition as their primary medical condition. They comprised the second largest group of disability support recipients in Australia (25%) (FACS 2003). There were 2,018 sickness allowance recipients with a psychological or psychiatric condition as their primary medical condition, representing 23% of all sickness allowance recipients (FACS Disability Payment Section, personal communication).

The proportion of anxiety, depressive and substance abuse disorders was significantly higher among those receiving income support payments (30.4% of Australians of work force age) than those not receiving income support (18.6%) (Butterworth 2003).

Mortality

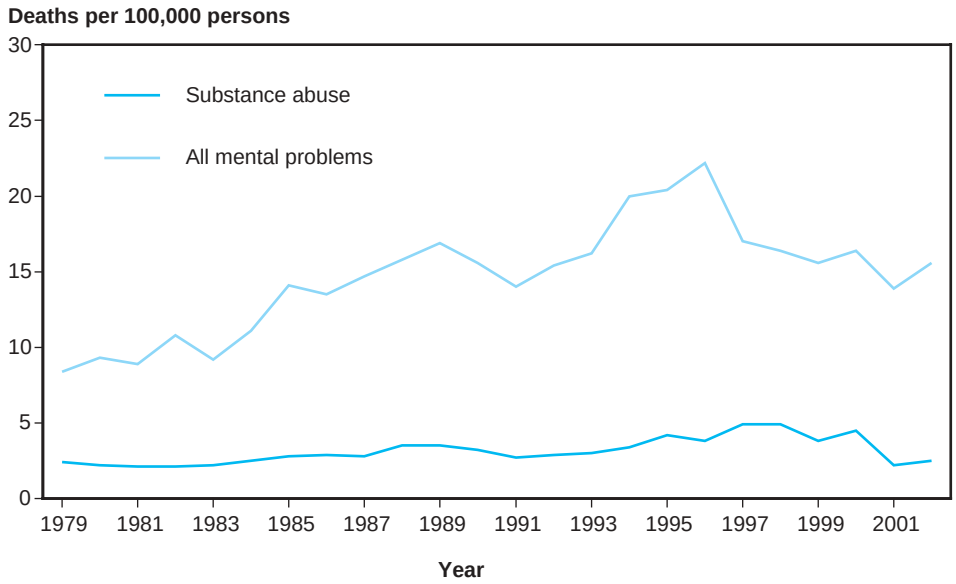
A mental or behavioural disorder was listed as the underlying cause in 3,172 deaths in 2002. The age-standardised rate was 15.6 per 100,000 population, down from the peak years of 1994 to 1996 (Figure 2.33). These statistics do not include suicides, reported separately in Section 2.4, usually attributed to a mental health problem.

Most of the deaths with a mental or behavioural disorder as the underlying cause of death are attributable to dementia (79.2% in 2002). An additional 15.6% (494 deaths) in 2002 were attributed to mental and behavioural disorders due to abuse of psychoactive substances such as alcohol or heroin.

Deaths attributed to mental and behavioural disorders due to psychoactive substance abuse were lower in 2001 (2.2 per 100,000 persons) and 2002 (2.5 per 100,000 persons), compared with the period from 1995 to 2000, when the rate averaged 4.3 per 100,000 persons (Figure 2.33).

Mental health problems and disorders burden

Mental health problems and disorders were estimated to account for 13% of the disease burden in Australia in 1996, 1% of years of life lost due to premature mortality and 27% of years of 'healthy' life lost due to poor health or disability (AIHW: Mathers et al. 1999).



Notes: ICD-10 codes: all mental and behavioural disorders, F00–F99; psychoactive substance abuse, F10–F19.

Source: AIHW National Mortality Database.

Figure 2.33: Death rates for mental and behavioural disorders, 1979 to 2002

Respiratory diseases

Obstructive airways diseases—asthma and chronic obstructive pulmonary disease (COPD)—are the two major respiratory diseases contributing to ill health in Australia.

Asthma

Asthma is a chronic inflammatory disease causing episodes of wheezing, breathlessness and chest tightness due to widespread narrowing of the airways within the lungs and obstruction of airflow. The symptoms are usually reversible, either spontaneously or with treatment (AIHW: Australian Centre for Asthma Monitoring 2003).

While asthma's underlying causes are still not known, environmental and other related factors, such as diet and lifestyle, may affect the risk of acquiring asthma, change the course of the disease, or trigger attacks of airway narrowing and symptoms. A wide range of factors trigger airway narrowing and symptoms in people with asthma, including exercise, viral infections, irritants (for example, smoking and indoor and outdoor air pollutants), specific allergens (house dust mites and mould spores) and some food preservatives.

Prevalence

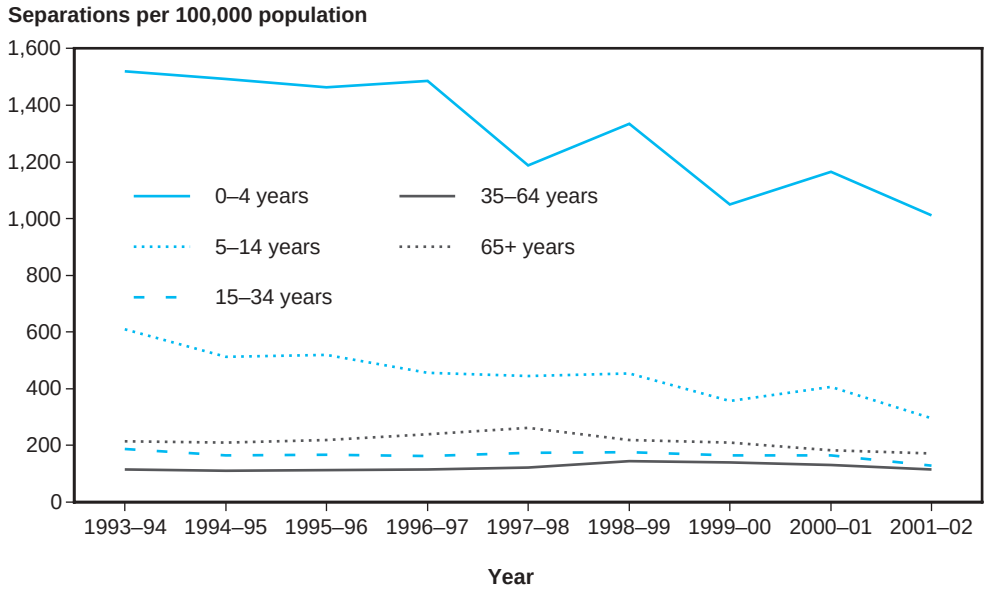
Recent surveys show that 14–16% of children and 10–12% of adults have asthma as a current problem. A higher proportion (20–30%) say that they have had wheezing in

the last year (AIHW: Australian Centre for Asthma Monitoring 2003). More boys than girls have asthma, but after the teenage years it is more common in women than in men.

There was an increase in the proportion of children with asthma in the 1980s and early 1990s. Recent studies in Melbourne (Robertson et al. 2004) and Belmont, New South Wales (Toelle et al. 2004), suggest there has been no further increase since that time. There has been little change in the prevalence of asthma among adults over the last 20 years.

Hospitalisation

Children, particularly those aged less than 5, have higher rates of hospitalisation for asthma than adults. However, the rate among children has declined since 1993. There has been little change in the hospitalisation rates for asthma among adults over the same period (Figure 2.34).



Note: Asthma classified according to ICD-9-CM code 493 and ICD-10-AM codes J45 & J46. Hospital separations coded to ICD-9-CM (1993–97) were converted to ICD-10-AM using the following conversion: ages 0–34 years, no conversion; 35–64 years, converted by a factor of 0.64; 65+ years, converted by a factor of 0.53.

Source: AIHW National Hospital Morbidity Database.

Figure 2.34: Trends in hospitalisation for asthma, 1993–94 to 2001–02

The hospitalisation rates among the elderly (aged 65 and over) are highest during winter, whereas among children the peaks occur in February and May.

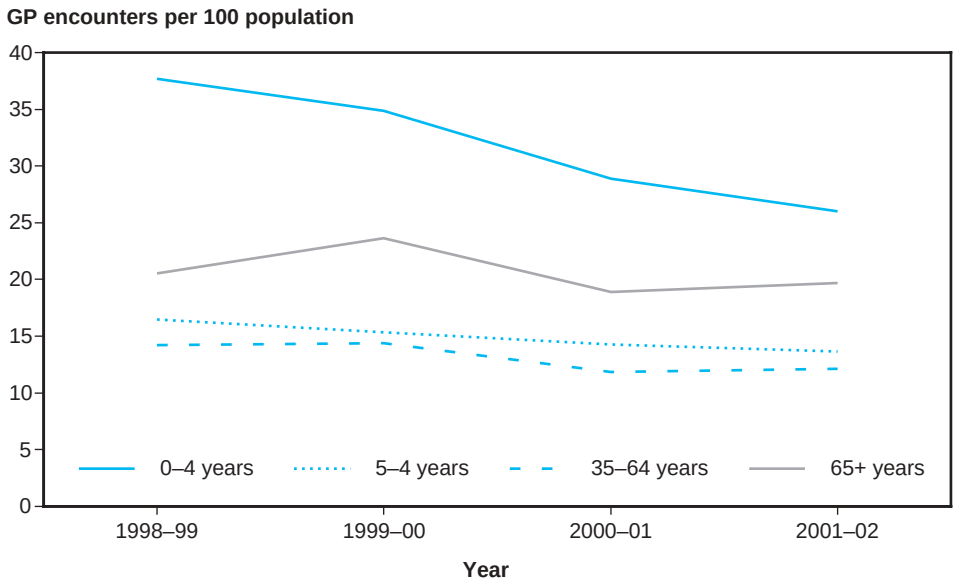
Boys have higher rates of hospitalisation for asthma than girls, in keeping with the disease's higher prevalence among boys. However, the pattern reverses after the age of 15 when more females than males are hospitalised for asthma.

GP visits

During the period 1998–99 to 2001–02, the average annual rate of GP encounters at which asthma was managed was 16 per 100 population. This represents 3% of all GP encounters over that period. The rate fell by almost one-third in the youngest age group (0–4) between 1998–99 and 2001–02 (Figure 2.35).

Mortality

Asthma is not a large cause of mortality but the death rates in Australia are high by international standards. The risk of dying from asthma increases with age and the majority of deaths occur in people aged 65 and over, particularly during the winter months.



Note: Asthma classified according to ICPC-2 PLUS codes: R96001–R96005, R96007, R96008.

Source: BEACH Survey of General Practice.

Figure 2.35: Asthma-related general practice encounters, 1998–99 to 2001–02

There was an increase in the number of deaths from asthma during the 1980s. Since 1989, there has been a decline in asthma deaths. This is evident across all ages, and in particular among people aged 5 to 34, in whom the attribution of death to asthma is more specific (Figure 2.36).

Asthma burden

Asthma was estimated to account for 3% of the disease burden in Australia in 1996, 1% of years of life lost due to premature mortality and 5% of years of 'healthy' life lost due to poor health or disability (AIHW: Mathers et al. 1999).

Note: Age-standardised to the Australian population as at 30 June 2001. Asthma classified according to ICD-9 code 493 and ICD-10 codes J45 & J46. Deaths coded to ICD-9 (1979–96) were converted to ICD-10 using the following conversion: ages 0–34 years, no conversion; 35–64 years, converted by a factor of 0.84; 65+ years, converted by a factor of 0.68.

Source: AIHW National Mortality Database.

Figure 2.36: Trends in asthma mortality, 1979 to 2002

Chronic obstructive pulmonary disease

COPD is a serious and progressive long-term lung disease where damage to the lungs, usually due to both emphysema and chronic bronchitis, obstructs oxygen intake and causes increasing shortness of breath. Chronic bronchitis and emphysema can each occur on their own in a person with COPD, but they usually coexist in an individual (GOLD 2001).

The main symptom of COPD is shortness of breath on exertion and cough with sputum (phlegm). A condition very similar to COPD may occur in some patients whose underlying disease is chronic asthma. In many cases the underlying disease cannot be accurately identified in routine clinical practice. COPD is a cause of substantial morbidity and mortality in Australia.

Risk factors

Tobacco smoking is the most important risk factor for COPD. Passive exposure to tobacco smoke may also contribute to respiratory symptoms and the development of COPD (de Marco et al. 2004). Exposure to other environmental agents, including indoor and outdoor air pollutants (Tashkin et al. 1994), and occupational dusts and chemicals (Kauffmann et al. 1982; Viegi et al. 1991), is also a known risk factor. Genetic factors in COPD are uncommon (Silverman et al. 1998).

Comorbidity

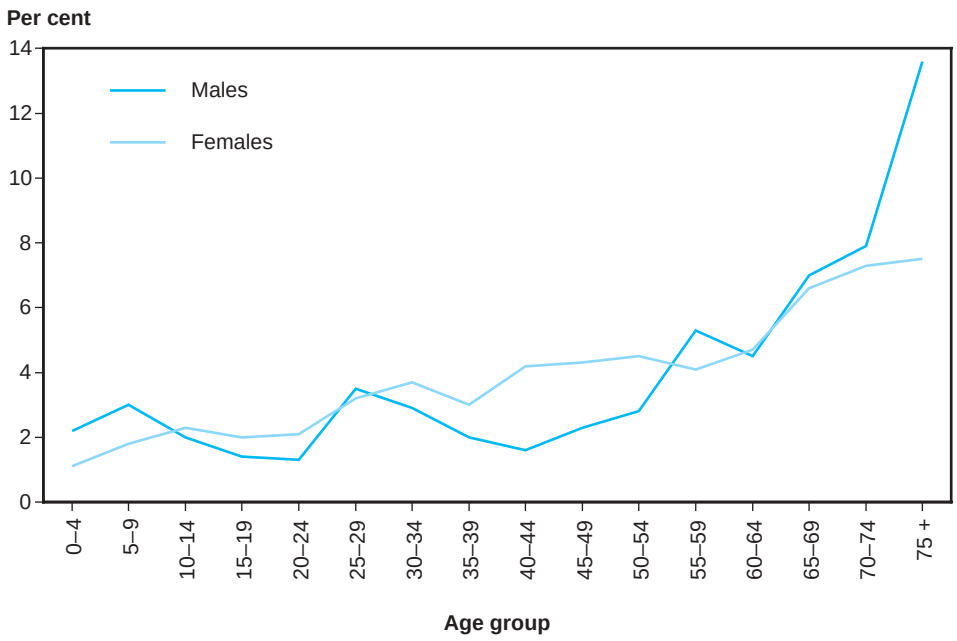
The major comorbidities associated with COPD are other smoking-related chronic diseases: vascular disease, in particular coronary artery disease, and lung cancer. Other common diseases in the middle-aged and older person, such as diabetes and obstructive sleep apnoea, often complicate COPD management.

The major complication of COPD is a worsening due to infection, resulting in an acute fall in the lungs' air capacity, an increase in symptoms and, often, the need for hospitalisation.

Prevalence

Based on the 2001 National Health Survey, about 665,000 persons had COPD that year, representing about 3.5% of the Australian population. These are probably underestimates because self-reports of COPD are not fully reliable. More accurate prevalence data for COPD, based on lung function measures, are not available in Australia.

Self-reported COPD increased with age (Fiure 2.37) and was more common in 2001 among males (3.7%) than females (3.4%). These findings are consistent with hospitalisation and mortality data (see opposite) as well as self-reported COPD-related symptoms (Abramson et al. 2002).



Source: ABS 2001 National Health Survey.

Figure 2.37: Age-specific prevalence of COPD, 2001

Hospitalisation

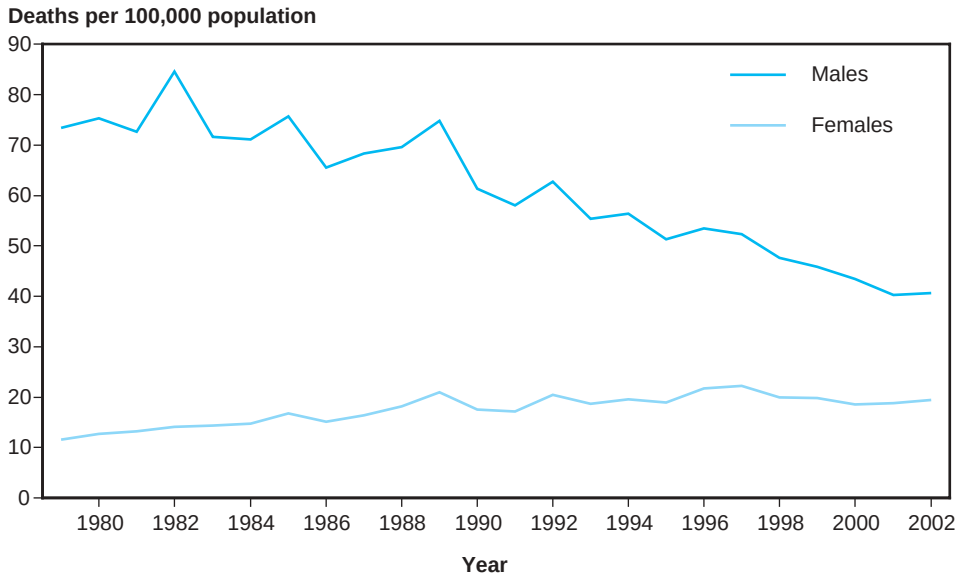
COPD is a major reason for hospitalisation in Australia. In 2001–02, there were 51,621 hospitalisations where the principal diagnosis was COPD (accounting for 0.8% of all hospitalisations), with an average length of stay of 7.5 days.

Hospitalisation for COPD occurs mainly among the elderly, with those aged 65 and above accounting for more than 77% of all COPD separations. Males were more likely to be hospitalised for COPD than females (344 separations per 100,000 males compared with 206 separations per 100,000 females).

Mortality

COPD is a major cause of death, reflecting the end result of a progressive decline in lung function. In 2002, COPD was the underlying cause of 5,599 deaths (4.2% of all deaths). More males died of COPD than females, with age-standardised death rates of 40.6 per 100,000 and 19.5 per 100,000 respectively.

The death rate for COPD has declined over the last three decades (Figure 2.38) with the majority of the decrease attributable to a decline in male deaths. Possible explanations for this decline include improved medical care, a higher proportion of people with established COPD who quit smoking, and improved overall smoking trends. In contrast to the encouraging trend among males, the COPD death rate in females increased between 1970 and 1990 and has remained steady thereafter. The increase in female deaths may be the delayed result of an increase in the proportion of female smokers since the late 1970s.



Source: AIHW National Mortality Database.

Figure 2.38: Trends in chronic obstructive pulmonary disease mortality, 1979 to 2002

Chronic obstructive pulmonary disease burden

COPD was estimated to account for 4% of the disease burden in Australia in 1996, 4% of years of life lost due to premature mortality and 3% of years of 'healthy' life lost due to poor health or disability (AIHW: Mathers et al. 1999).

Diabetes

Diabetes is a metabolic disease in which high blood glucose levels result from defects in insulin secretion, insulin action or both (WHO 1999; Dunstan et al. 2001). Insulin is a hormone produced by the pancreas that helps the body use glucose for energy.

Diabetes contributes to significant illness, disability, poor quality of life and premature mortality, especially if undetected or poorly controlled. In 2002, it was the ninth and tenth leading cause of death in Australia among males and females respectively. Over the course of the disease, diabetes can lead to long-term damage to various parts of the body, especially the heart and blood vessels, eyes, kidneys and nerves. Diabetes also contributes to many pregnancy-related complications both before and after birth, and for both the mother and the baby.

Types of diabetes

There are several types of diabetes, with different causal mechanisms and clinical histories. The three main types are Type 1, Type 2 and gestational diabetes.

Type 1 diabetes is marked by a total or near-total lack of insulin and results from the destruction of insulin-producing cells in the pancreas. People with this form of diabetes require daily insulin therapy to survive. It is the most common cause of childhood diabetes and accounts for 10–15% of all diabetes in Australia.

Type 2 diabetes is marked by reduced levels of insulin or the inability of the body to use insulin properly (insulin resistance). The disease is more common among people aged 45 and above and accounts for 85–90% of all those with diabetes. Many people with this form of diabetes need insulin therapy to control their blood glucose levels.

Gestational diabetes occurs during pregnancy in about 3–8% of females not previously diagnosed with diabetes. Some women with this type of diabetes need insulin therapy to control their blood glucose levels. It is a transient form of diabetes and usually disappears after the baby is born. However, it is a marker of increased risk of developing Type 2 diabetes later in life.

Risk factors for diabetes

Both genetic and environmental factors contribute to the onset of diabetes. Type 1 diabetes is believed to be caused by particular biological interactions and exposure to environmental triggers in people genetically predisposed to diabetes. In addition to ageing and genetic predisposition, the risk of developing Type 2 diabetes increases with body fatness. Regular physical activity, however, plays a protective role against the development of Type 2 diabetes (Tuomilehto et al. 2001; Diabetes Prevention Program Research Group 2002). The risk factors for gestational diabetes are mostly similar to those for Type 2 diabetes and include the age of the mother, body fatness and ethnicity. Diabetes shares several of the risk factors with, and is itself a risk factor for, cardiovascular disease.

Incidence and prevalence

Incidence

There is limited information on the incidence of diabetes in Australia, and most of the data that exist are for Type 1 diabetes. The National Diabetes Register is the only source of national incidence data for diabetes. The register holds data on people with insulin-treated diabetes, including Type 1, Type 2 and gestational diabetes (see Box 2.6 for more detail).

Coverage of new cases of insulin-treated diabetes in children aged 0–14 is considered to be close to 100% in the register. Over the 2000–2002 period, around 2,400 new cases of Type 1 diabetes in children aged under 15 were recorded. This equates to an average annual incidence of around 20 new cases per 100,000 population in this age group.

In Australia, previous survey-based estimates of the incidence of Type 1 diabetes in the 0–14 age group have ranged from 12.3 per 100,000 in 1983 (Glatthaar et al. 1988) to 17.8 per 100,000 in 1990–1996 (Craig et al. 2000). Thus the latest incidence data from the National Diabetes Register support recent reports suggesting that the incidence of Type 1 diabetes is increasing among children aged 0–14 years.

Box 2.6: National Diabetes Register

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

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

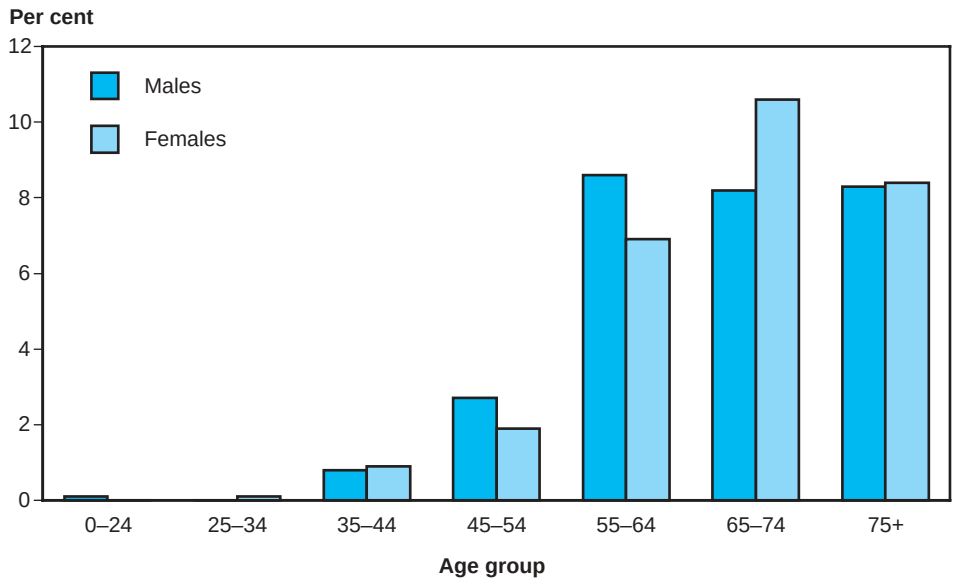
Around 32,600 people were registered on the National Diabetes Register between 1999 and 2002. Around 60% of registrants were found to have Type 2 diabetes, 28% Type 1 diabetes and 9% gestational diabetes. At diagnosis, 48% of registrants were aged 45 and above and 11% were aged between 0 and 14.

Prevalence

There are two main sources of national prevalence data for diabetes—the 1999–2000 Australian Diabetes, Obesity and Lifestyle (AusDiab) Study and the ABS National Health Surveys. In AusDiab, the prevalence of diabetes was estimated on the basis of measured blood glucose levels whereas in the National Health Surveys it is based on self-report.

Based on data from AusDiab, it is estimated that almost one million Australian adults aged 25 and above had diabetes in 2001, 7.6% of the population. About half these people were not aware that they had diabetes (Dunstan et al. 2002). With the addition of the number of people aged under 25 who have Type 1 diabetes, it is likely that more than one million people in Australia have diabetes.

More recent estimates of the prevalence of diabetes come from the ABS 2001 National Health Survey. These estimates are based on self-reported data, which are known to underestimate the true prevalence of diabetes as they do not include people who do not know they have diabetes. In the 2001 National Health Survey, 0.5% of respondents reported having Type 1 diabetes, while 2.3% of respondents reported having Type 2 diabetes. A further 0.1% reported having diabetes but did not know which type. Among people aged less than 75, the prevalence of Type 2 diabetes increased with age, rising from less than 1% in those aged under 45 to around 10% in those aged 65–74 (Figure 2.39).



Note: Estimates for males aged 0–24 and 35–44 and females aged 35–44 have relative standard errors of between 25% and 50% and should be used with caution. Estimates for males aged 25–34 and females aged 0–34 have relative standard errors greater than 50% and are considered too unreliable for general use.

Source: ABS 2001 National Health Survey.

Figure 2.39: Age-specific prevalence of self-reported Type 2 diabetes, 2001

Aboriginal and Torres Strait Islander peoples have significantly higher rates of diabetes, especially Type 2 diabetes, than other Australians. In 2001, the age-standardised prevalence of self-reported diabetes among Indigenous Australians was almost four times as high as that reported by non-Indigenous Australians (11% compared with 3%) (ABS 2002d). Further, Indigenous Australians from remote areas were almost twice as likely as those from non-remote areas to report having diabetes (16% compared with 9%).

People born in some overseas regions have a higher prevalence of diabetes than people born in Australia (AIHW: Holdenson et al. 2003). It is thought that this difference is due to a combination of genetic, biological, behavioural and environmental risk factors. In 2001, men born in the Middle East and North Africa were 3.6 times as likely to report having diabetes as Australian-born men; and women born in Southern and Eastern Europe and Central Asia were 1.5 times as likely to report diabetes as Australian-born women (Table 2.23).

The prevalence of diabetes among Australian adults has more than doubled since the early 1980s. In 1999–2000, the age-standardised prevalence of diabetes was 7.2% compared with 3.4% in 1981 (Dunstan et al. 2002). An ageing population, early detection and underlying trends in risk factors such as obesity, physical inactivity and impaired glucose tolerance have contributed to an increase in the incidence, and hence prevalence, of Type 2 diabetes in Australia. Better management may have also contributed to the current increases in its prevalence because people with diabetes may now be surviving longer.

Table 2.23: Self-reported diabetes prevalence ratios by region of birth, 2001

	Prevalence ratios[(a)]	
Region of birth	**Males**	**Females**
UK & Ireland	1.2	0.7
North & West Europe	1.3	0.6
Southern & Eastern Europe, & Central Asia	0.9	[(b)]1.5
Middle East & North Africa	[(b)]3.6	2.4
South-East Asia & Southern Asia	[(b)]1.9	1.5
All other countries	1.6	0.6

(a) Australian-born rate set at 1.00.

(b) Different from Australian-born rate at the 5% level of significance.

Note: Ratios were calculated using the indirect method of age-standardisation (AIHW: Holdenson et al. 2003).

Source: AIHW: Holdenson et al. 2003.

Diabetes-related complications

Diabetes can lead to a range of complications, including diseases of the large blood vessels (macrovascular disease) such as coronary heart disease, stroke and peripheral vascular disease as well as diseases of the small blood vessels (microvascular disease) such as kidney disease and retinopathy.

All types of diabetes are known to be associated with complications in pregnancy and childbirth. Poorly managed diabetes in pregnancy can lead to spontaneous abortions, stillbirths or difficult births.

Several factors contribute to the risk of developing complications in diabetes. In addition to poorly controlled glucose levels, duration of the disease and age, other risk factors include obesity, high blood pressure, high blood cholesterol, tobacco smoking and genetic predisposition. Avoiding or reducing risk-increasing behaviours and conditions can delay the onset or slow down the progression of complications.

Among adults attending specialist diabetes services (diabetes centres and specialist endocrinologists in private practice) in 2002, 26.0% had peripheral neuropathy (nerve damage), 13.5% had peripheral vascular disease, and 2.2% had a current foot ulcer (NADC 2003). In addition, in the last 12 months, 4.2% had a severe hypoglycaemic episode, 3.3% suffered a heart attack, 2.1% had a stroke, 0.7% had a lower limb amputation, 0.8% suffered new blindness, just under 0.1% suffered end-stage renal disease, and 3.9% of males had erectile dysfunction. However, it should be noted that specialist diabetes clinics are likely to see more patients with complications than would be observed among people with diabetes generally.

Data from the Australia and New Zealand Dialysis and Transplant Registry show that in Australia in 2001, diabetic kidney disease (diabetic nephropathy) was the second most common cause of kidney failure, accounting for one in four kidney failure registrants (McDonald & Russ 2002).

The 2001 National Health Survey self-reports also reveal a higher prevalence of complications among persons with diabetes. Their reports of current angina, heart attack or stroke were double the rates reported by persons without diabetes (Table 2.24). They were also over twice as likely as people without diabetes to report eye disorders such as blindness, glaucoma and cataracts.

Table 2.24: Self-reported prevalence of diabetes-related complications, 2001 (per cent)

Complication	Persons with diabetes	Persons without diabetes
Angina	4.4	2.0
Heart attack	2.7	1.1
Stroke	1.8	0.8
Partial or complete blindness	2.7	1.2
Glaucoma	3.0	1.4
Cataracts	7.0	2.9

Notes

1. Age-standardised to the Australian population at 30 June 2001.
2. Persons aged 25 and over.

Source: ABS 2001 National Health Survey.

Health service use

People with diabetes are more likely to consult health professionals or use hospital services than those without diabetes. This is related to treatment for blood glucose control, as well as for complications associated with diabetes.

GP visits

According to the 2002–03 BEACH survey, diabetes represented 2.0% of all problems managed by GPs, at a rate of 2.9 per 100 encounters (AIHW: Britt et al. 2003). For persons being managed for diabetes, high blood pressure and lipid disorders were the other main problems managed. Coronary heart disease was a common disease managed in males with diabetes, whereas osteoarthritis was the most commonly managed problem among females with diabetes.

Hospital separations

Diabetes was the principal diagnosis in 53,224 (0.8%) hospital separations in 2001–02. It was reported more often as an additional diagnosis, particularly in association with the primary diagnoses of coronary heart disease, stroke and kidney disease. When separations for diabetes as both principal and additional diagnosis are combined, the total number of such separations rises to 389,940, or 6.1% of all hospital separations. This higher number better reflects the extent of diabetes-related morbidity in the population, and its management in a hospital setting.

As well as accounting for a large proportion of hospital episodes, the average length of stay for persons with diabetes who are hospitalised for at least one night was longer than the overall average: 10 days for diabetes as the principal diagnosis compared with 9 days for all other diagnoses. When separations for diabetes as an additional diagnosis were also taken into account, the average length of stay was 11 days.

Mortality

In 2002, diabetes was the underlying cause of 3,329 deaths, or 2.5% of all deaths in that year. In addition, it was listed as an associated cause in 11,467 deaths.

Diabetes is rarely the only cause of death recorded on death certificates (1.7% of cases). Where it is an underlying cause of death, conditions listed as associated causes included coronary heart disease (in 50% of cases), stroke (22%) and renal failure (15%). When diabetes was listed as an associated cause, coronary heart disease was the underlying cause of death in 24% of cases and stroke was the underlying cause in 8% of cases.

The death rate for diabetes (as an underlying cause) has shown an increase in recent years among males, with an average annual increase of 1.2% between 1989 and 2002. There has been no notable trend among females.

Diabetes burden

Diabetes was estimated to account for 3% of the disease burden in Australia in 1996, 2% of years of life lost due to premature mortality and 4% of years of 'healthy' life lost due to poor health or disability (AIHW: Mathers et al. 1999). In addition, diabetes leads to increased heart disease and stroke. These effects increased the diabetes burden to 4.9% of total burden in 1996.

Arthritis and musculoskeletal conditions

Arthritis is a musculoskeletal condition marked by inflammation of the joints, causing pain, stiffness, disability and deformity. Other musculoskeletal conditions include other joint problems and disorders of the bones, muscles and their attachments to each other.

Arthritis and musculoskeletal conditions are highly prevalent and large contributors to illness, pain and disability. They place a significant burden on the community, both economic and personal, including the use of hospital and primary care services, disruptions to daily life and lost productivity through disability. In view of this burden, arthritis and musculoskeletal conditions were declared a National Health Priority Area in July 2002 by the Australian health ministers. The initial focus in this priority area is on osteoarthritis, rheumatoid arthritis and osteoporosis.

There are more than 100 forms of arthritis and musculoskeletal conditions, which may result from congenital anomalies, metabolic or biochemical abnormalities, infections, inflammatory conditions, cancer and trauma. Brief descriptions follow of five prominent arthritis and musculoskeletal conditions, namely back pain, osteoporosis, osteoarthritis, rheumatoid arthritis and gout.

Back pain

Back pain is a common condition whose causes include the displacement of an intervertebral disc and muscle strain. Most back problems and complaints are transitory and short term, but in some cases they can become chronic.

- In the 2001 National Health Survey, 20.9% of respondents reported back pain, with similar prevalence in the two sexes. Back pain was mostly reported by people in middle and older age groups, particularly those aged 55–64 years.
- The hospital separation rates for back pain in 2001–02 were higher among females (210 per 100,000) than males (184 per 100,000). The separation rates increased with age, most rapidly from age 55–64 onwards, and highest at age 85 and above.
- Back complaints were the ninth most frequent reason for GP visits, and the most common reason for which imaging was ordered by GPs in 2001–02.

Osteoporosis

Osteoporosis is the thinning and weakening of the bone substance with a resulting risk of fracture. It occurs more frequently in older persons, especially women, as bone tissue is progressively lost with ageing, although the rate of deterioration varies widely between individuals.

- In the 2001 National Health Survey, 1.6% of respondents reported having osteoporosis. The prevalence was 10.5% for females aged 65–74, increasing to 12.3% among female respondents aged 75 and above. Comparable rates among males were 1.2% and 1.5% respectively.
- In 2001–02, 39 per 100,000 persons were hospitalised with a principal diagnosis of osteoporosis, with 56% of these hospitalisations being due to pathological fractures. Hospitalisation was highest in females aged 65 and over.
- Only a small number of deaths are recorded as being caused directly by osteoporosis. In 2002, the death rate for osteoporosis was 0.8 per 100,000 persons (1.1 per 100,000 females and 0.3 per 100,000 males).

Osteoarthritis

Osteoarthritis, the most common form of arthritis, is a degenerative condition due mainly to accumulated wear that affects mostly the hands, spine and weight-bearing joints such as hips, knees and ankles. The disease begins in cartilage overlaying the ends of joint bones, and is caused and accelerated by mechanical forces, disrupting the normal function of the joint. Pain is initially felt in the joints during and after activity, but as degeneration progresses it may occur with only minimal movement or even during rest.

- Osteoarthritis is more common among females. In the 2001 National Health Survey, 9.2% of the females surveyed reported having osteoarthritis, compared with 5.7% of the males. The prevalence increases with age, and is highest among those aged 65 and above.

- Osteoarthritis was the tenth most frequently managed problem in general practice, and the third most common problem for which imaging was ordered by GPs.
- The number of hospital separations for osteoarthritis has increased by 63% over the past nine years, from 39,186 in 1993–94 to 64,044 in 2001–02, with an average length of stay of 5.9 days.

Rheumatoid arthritis

Rheumatoid arthritis is a chronic auto-immune disease involving inflammation of the joints, most often affecting the hand joints in symmetrical fashion, and often producing deformities.

- Rheumatoid arthritis is more common among females. In the 2001 National Health Survey, 2.7% of the females reported having rheumatoid arthritis compared with 2.0% of the males. The prevalence of rheumatoid arthritis increases sharply with age, and is greater in females at nearly all ages.
- There are far fewer hospital separations for rheumatoid arthritis compared with other musculoskeletal conditions, and these have declined from 6,179 to 4,609 over the nine-year period from 1993–94 to 2001–02.

Gout

Gout is a painful musculoskeletal disease involving deposits of uric acid crystals in the joint spaces, connective tissue or both. The first attack generally occurs between the ages of 40 and 50, although gout can occur at any age and is more common among males. Gout among females usually develops after menopause.

- In the 2001 National Health Survey, 1.4% of respondents had gout. The prevalence in males was more than five times that in females (2.2% compared to 0.4%).
- There are few hospital separations for gout. In 2001–02, 15 per 100,000 persons were hospitalised with a principal diagnosis of gout. Separation rates were higher among males (25 per 100,000) than females (6 per 100,000), and among those aged 65 and over.

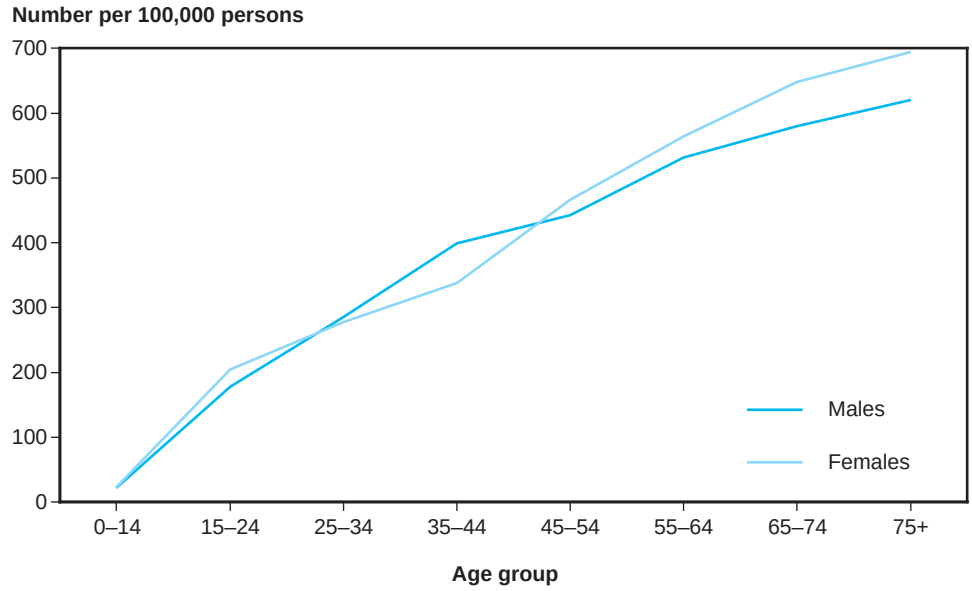
The non-fatal and recurrent nature of arthritis and musculoskeletal conditions makes it difficult to fully assess and report on their health outcomes. The remainder of this section discusses these conditions generally in terms of prevalence, use of health services, and indicators of function, disability and quality of life.

Prevalence

Based on the 2001 National Health Survey, more than six million Australians (323 out of 1,000 persons) are estimated to have had arthritis and musculoskeletal conditions that year. This included some type of swelling in their joints, limitations in their motion or pain when they moved. Similar rates of occurrence were reported by both sexes; however, certain disorders were more prevalent either in males or in females. Increasing age is a strong risk factor for arthritis and musculoskeletal conditions, as shown in Figure 2.40.

The most commonly reported conditions in the 2001 National Health Survey were back pain (20.9% of respondents) and arthritis (13.9% of respondents). While the former was more common in males, the latter was reported more often by females.

About 83% of those with disability due to arthritis and related conditions reported at least one core activity restriction. These restrictions were mainly in mobility, followed by self-care, and in both cases the restriction was higher among females than males.



Source: AIHW analysis of ABS 2001 National Health Survey.

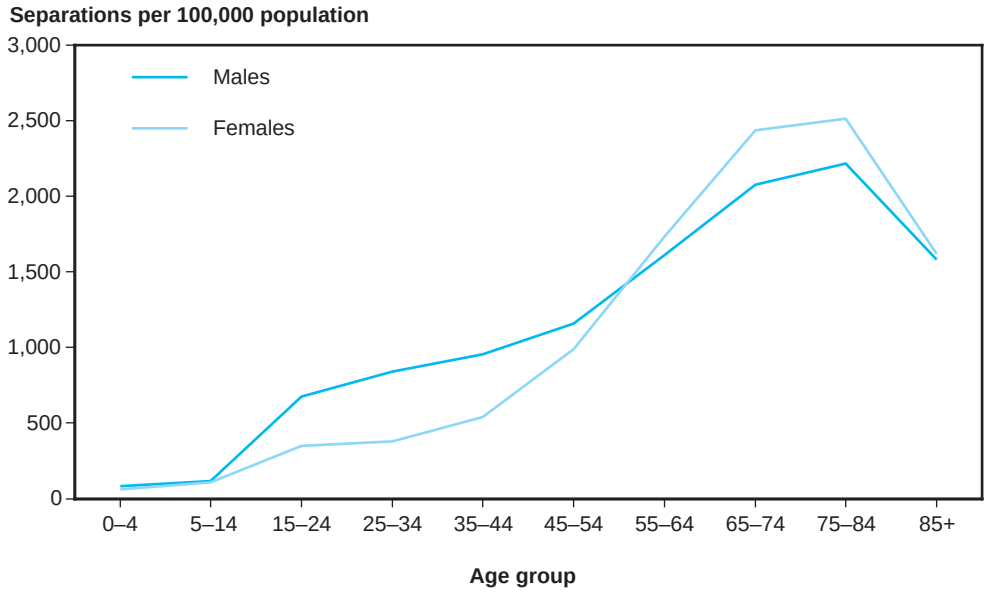
Figure 2.40: Age-specific prevalence of arthritis and musculoskeletal conditions, 2001

The high prevalence of arthritis and musculoskeletal conditions is also reflected in visits to GPs, other specialists and health professionals, and short-stay hospital separations. Arthritis and musculoskeletal conditions were the second most frequently managed problem (18 per 100 encounters) by GPs in 2001–02, accounting for 12% of problems managed that year. Back complaint was the most common musculoskeletal condition managed in general practice, followed by osteoarthritis.

Hospitalisation for arthritis and musculoskeletal conditions is less frequent and of shorter duration than for most other conditions. The hospital separation rate was 1,791 per 100,000 in 2001–02, with an average length of stay of 3.6 days. The separation rate was slightly higher in males than in females (Figure 2.41).

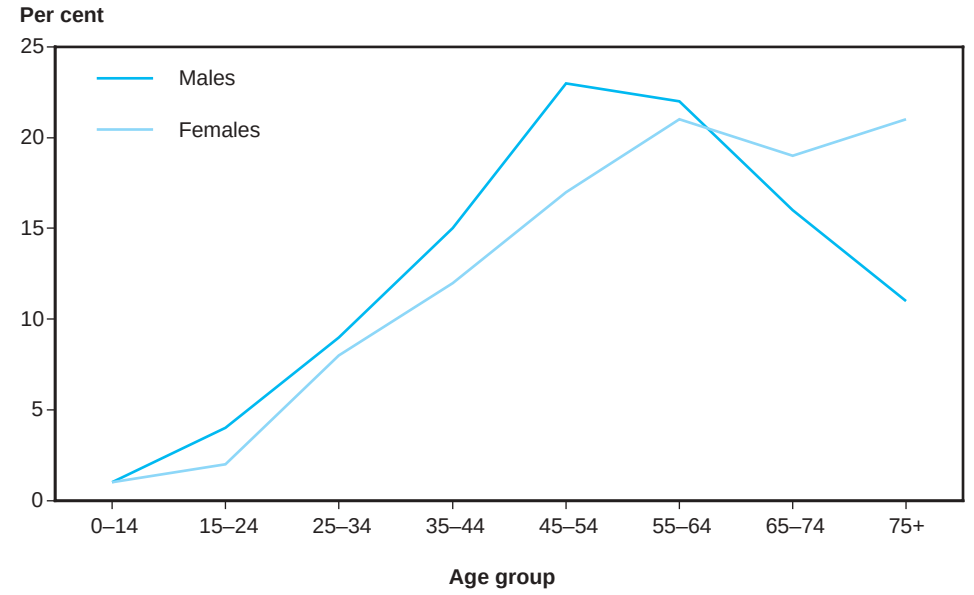
Disability

Arthritis and musculoskeletal conditions cause more disability than any other medical condition. From self-reports in the Survey of Disability, Ageing and Carers, around 1.2 million Australians (about 34% of all persons with a disability) had a disability due to these conditions in 1998, with 55% of these being females. Disability was particularly marked in the 45–64 age group (Figure 2.42).



Source: AIHW National Hospital Morbidity Database.

Figure 2.41: Age-specific hospital separation rates for arthritis and diseases of the musculoskeletal system, 2001–02



Source: AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers.

Figure 2.42: Age-specific prevalence of disability due to arthritis and related conditions, 1998

Mortality

Although death is not a common outcome of arthritis and musculoskeletal conditions, 5 deaths per 100,000 in Australia were recorded as being due to these conditions in 2002. Of these, about 2 deaths per 100,000 were attributed to arthritis.

Arthritis and musculoskeletal disorders burden

Arthritis and musculoskeletal disorders were estimated to account for 4% of the disease burden in Australia in 1996, 1% of years of life lost due to premature mortality (YLL) and 7% of years of 'healthy' life lost due to poor health or disability (YLD) (AIHW: Mathers et al. 1999).

Chronic renal disease

The kidneys act as a filter to help regulate the body's balance of water and a range of other substances in the blood. If the kidneys' functions are impaired or fail, waste products and toxins will build up in the blood, which may be lethal.

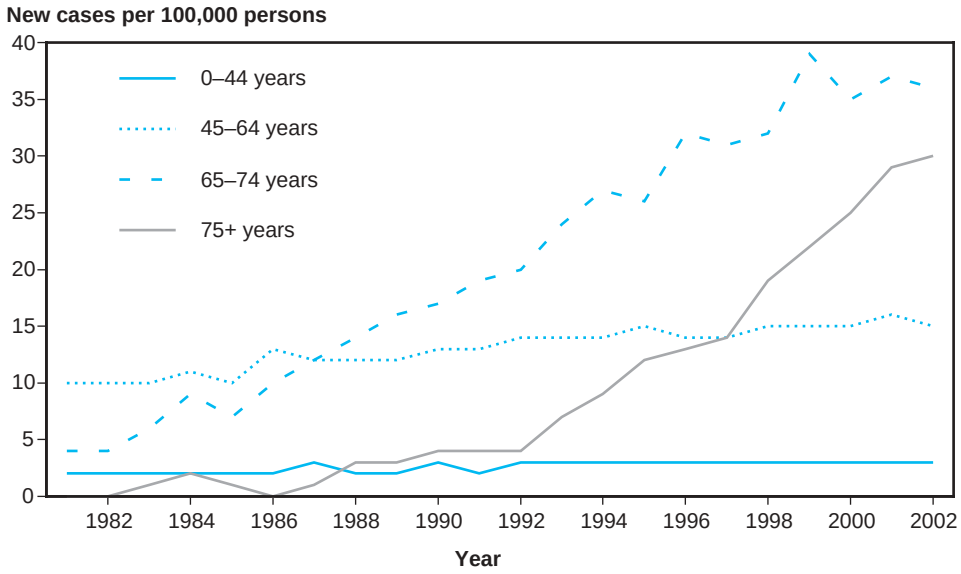
Chronic renal (kidney) disease is marked by long-term and irreversible loss of kidney function. Typically, the onset of symptoms is slow, with kidney function often deteriorating substantially before detection. The disease can affect all the organ systems in the body, but common problems include fluid retention, high blood pressure, anaemia and loss of appetite. The condition reaches end-stage renal disease (ESRD) when approximately 90% of the kidney function has been lost. Dialysis or transplantation is then required to sustain life.

Kidney disease contributes substantially to mortality and disability in Australia, especially in the Indigenous population. However, its overall impact is difficult to assess, due to the limited and disparate nature of the data. While mortality and hospitalisation data provide some useful information, reliable data on incidence and prevalence are limited to ESRD. ESRD data are compiled by the Australian and New Zealand Dialysis and Transplantation Registry (ANZDATA) from all persons undertaking renal replacement therapy, that is, persons on dialysis or living with a kidney transplant.

Incidence of ESRD

According to ANZDATA, 1,855 persons (1,117 males and 738 females) began treatment for ESRD in 2002, compared with 556 in 1981. The average age of patients beginning treatment in 2002 was 59.3 years (McDonald & Russ 2003), well above the average of 42.3 years in 1981.

The incidence of ESRD below the age of 45 was stable between 1981 and 2002 but for the age group 45–64 the incidence increased by 50% (from 10 to 15 per 100,000 population). During this period, incidence in the age group 65–74 increased to ninefold (from 4 to 36 per 100,000). For the oldest age group (75 and above), the reported incidence of ESRD, low until 1992, was 30 per 100,000 in 2002 (Figure 2.43). The increasing prevalence of diabetes is a major contributor to this rise in ESRD incidence.



(a) New cases of renal replacement therapy.

Source: ANZDATA Registry, unpublished data.

Figure 2.43: Trends in the incidence of end-stage renal disease[(a)], 1981 to 2002

Prevalence of ESRD

At the end of 2002, a total of 12,960 persons registered with ANZDATA were receiving renal replacement therapy (dialysis or transplantation), an age-standardised rate of 65 per 100,000 persons. The prevalence was higher in males (78 per 100,000) than in females (53 per 100,000). ESRD prevalence increases rapidly with age, being the highest (193 per 100,000) among persons aged 65–74 in 2002.

The prevalence of ESRD has almost tripled since 1981 (Figure 2.44). While some of this increase may be attributed to a higher incidence of kidney failure, improved management of other illnesses and new technologies are also likely to have contributed to these numbers by keeping people alive.

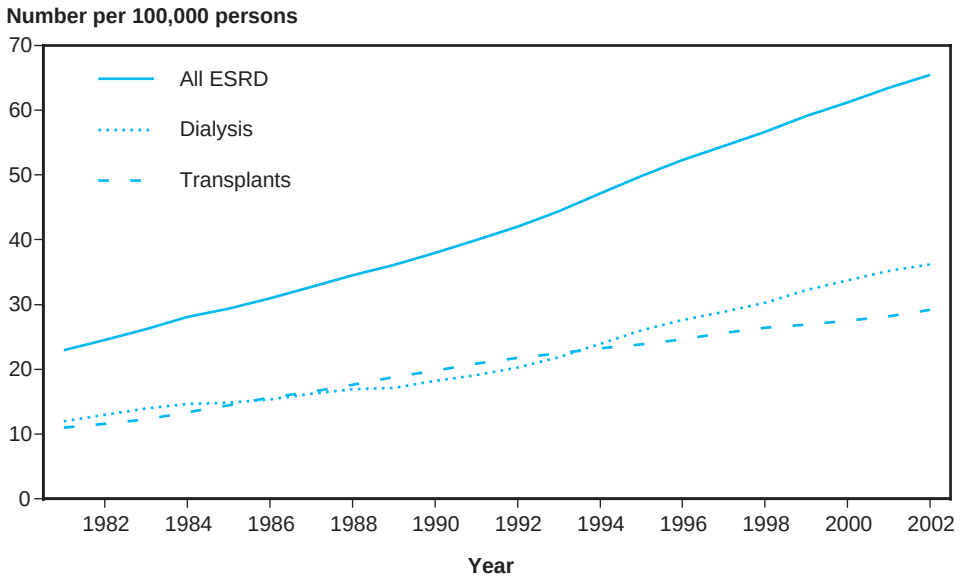
Up to 1994, about half of those receiving renal replacement therapy were undergoing dialysis and the rest were living with a kidney transplant. Since then, the proportion of those on dialysis has increased rapidly. By 2002, 56% of persons registered with ANZDATA were undergoing dialysis and 44% had transplants. The higher average age of persons on renal replacement therapy is one factor contributing to this shift, as older persons are less likely to opt for or be accepted for transplantation. Another factor is the low growth in the availability of donor organs.

Risk factors

A variety of risk factors contribute to the development of renal disease. A leading underlying cause (especially among younger people) is glomerulonephritis. This is a

group of diseases marked by inflammation of the filters (glomeruli) of the kidney. There are several causes of glomerulonephritis, including some infections, but most cases are due to other diseases where the body attacks these filtering units. Diabetes is another major risk factor that affects kidney function by damaging blood vessels, leading to diabetic nephropathy. High blood pressure (hypertension) also causes a narrowing and thickening of vessels in the kidneys, impairing the kidneys' filtering ability. Individuals with both diabetes and high blood pressure are at much higher risk of kidney disease.

Over one-quarter (27%) of new ESRD cases in 2002 were due to glomerulonephritis. Diabetic nephropathy was the second most common cause (26%), followed by hypertension-induced kidney damage (16%). The fourth major cause of ESRD, polycystic kidney disease (6%), is an inherited condition in which many cysts form in the kidney and can slowly replace the mass of the kidneys, leading to renal failure (McDonald & Russ 2003).



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

(a) Persons on renal replacement therapy per 100,000 population.

Source: ANZDATA Registry, unpublished data.

Figure 2.44: Trends in the prevalence of end-stage renal disease[(a)], 1981 to 2002

Use of health services

'Care involving dialysis' was the leading cause of hospital separations in Australia, with a total 636,010 separations (367,861 males and 268,149 females) in 2001–02, almost 10% of separations in that year and an increase of 10% from the previous year. These high numbers reflect the need for persons undergoing dialysis to receive treatment three to

four times per week. The dialysis separation rates were markedly higher in older age groups, peaking among those aged 65–74 at 39.2 per 1,000 males and 26.5 per 1,000 females.

There were another 11,601 hospital separations in 2001–02 with a principal diagnosis of kidney failure. Males (56%) were more likely to have such a separation than females (44%). The average length of stay for this diagnosis was 7.7 days for males and 8.4 days for females.

Mortality and comorbidity

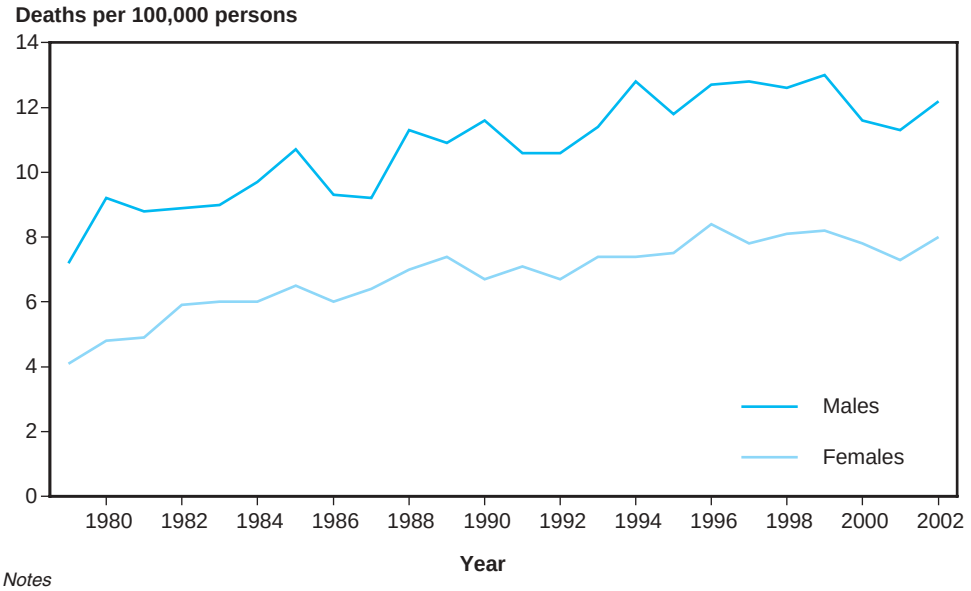
Kidney failure is a common cause of death, responsible for 1,925 deaths in 2002 (1.4% of all deaths in Australia in that year). In addition, kidney failure was listed on death certificates as an additional cause in a further 13,361 deaths. While ranked twelfth as an underlying cause of death in 2002, it was ranked seventh by the ABS as the leading cause of death if all death certificate listings were taken into consideration. The proportion of kidney failure as an underlying cause of death to all listings of kidney failure was 14.4%, a low number in comparison with other major chronic diseases (ABS 2003c). There is also likely to be underreporting of kidney disease on death certificates (Li et al. 2003).

Kidney failure also leads to a variety of complications, especially heart disease. Multiple cause of death data reveal that in only 7.0% of the cases where kidney failure was listed as the underlying cause of death, no other condition was listed. In all remaining cases, one or more associated causes were given. Heart failure and coronary heart disease were the most prominent associated conditions, listed in 28.6% and 26.1% of cases, respectively. Of the cases where kidney failure was the underlying cause of death, influenza and pneumonia, septicaemia, stroke and diabetes were the other prominent causes listed.

Kidney failure was listed as an associated cause in 23.6% of deaths where diabetes was the underlying cause of death, and in 19.5% of deaths due to heart failure. Of the 13,361 deaths in 2002 for which kidney failure was listed as an associated cause of death, coronary heart disease was the most common underlying cause of death (20.1% of listings). Malignant neoplasms (cancers) were the second most common underlying cause of death (16.3%).

Mortality from kidney failure in Australia increased steadily until the mid-1990s but has fluctuated slightly since then. The age-standardised death rate for kidney failure in 2002 was 12.2 per 100,000 males and 8.0 per 100,000 females (Figure 2.45).

Deaths from kidney failure occur at much higher rates in the Indigenous population than in the non-Indigenous population. In Queensland, Western Australia, South Australia and the Northern Territory (the four jurisdictions with adequate identification of Indigenous status in death registrations), there were 63 Indigenous deaths due to kidney failure in the period 2000–2002. This equates to an age-standardised death rate of 40 per 100,000, about five times the rate of the non-Indigenous population in those jurisdictions.



Notes

1. Age-standardised to the Australian population at 30 June 2001.
2. The mortality rates for 1979–96 (ICD-9) have been adjusted by a factor of 1.05 to make them comparable with the ICD-10 classification and 1997–2002 rates.

Source: AIHW National Mortality Database.

Figure 2.45: Trends in renal mortality, 1979 to 2002

Nervous system disorders

The nervous system consists of the brain, spinal cord and peripheral nerves. Damage or disturbance of these tissues are termed nervous system disorders or neurological diseases.

The most familiar of the nervous system disorders are Huntington's disease, motor neurone disease (MND), Parkinson's disease, Alzheimer's disease, multiple sclerosis (MS), epilepsy, carpal tunnel syndrome, muscular dystrophy and cerebral palsy. Bacterial infections of the central nervous system (some forms of meningitis and encephalitis), sleep disorders (including sleep apnoea) and headaches (including migraine) are other common nervous system disorders. Several diseases and conditions, including dementias (ICD-10 codes F01–F03) and viral infections of the central nervous system, for example, Creutzfeldt-Jakob disease or CJD (ICD-10 code A81), are closely related to this group of disorders.

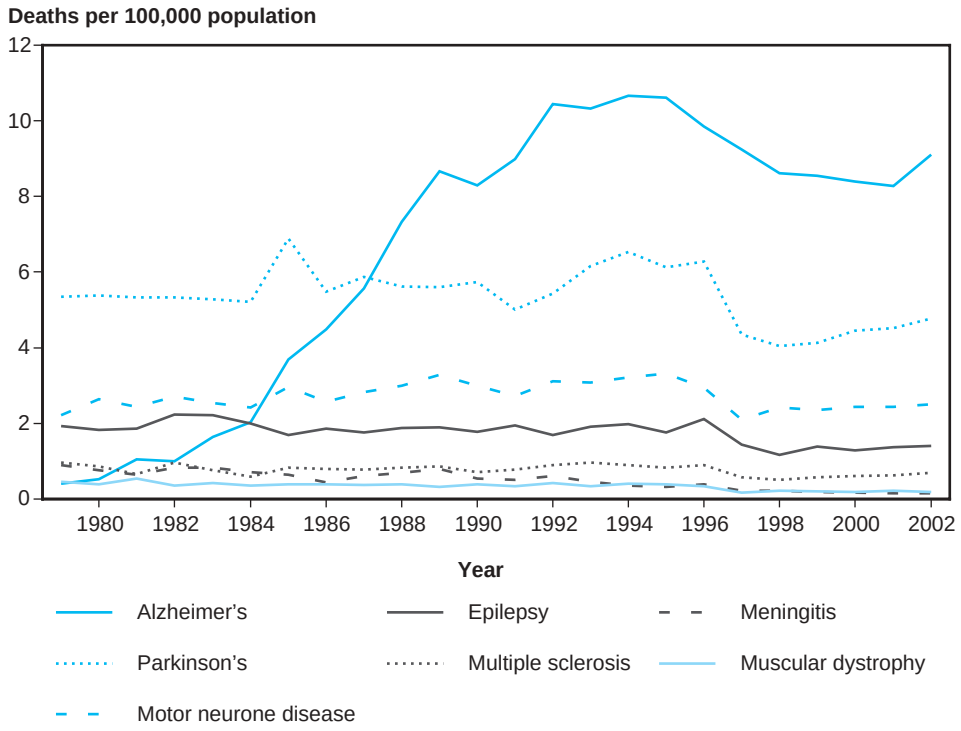
Prevalence

From self-reports in the 2001 National Health Survey, over 1.4 million Australians had a nervous system disease in that year. More than three-quarters of these (about 1.2 million persons) had migraine, 120,300 had epilepsy, and 170,000 had other diseases of the nervous system (ABS 2002c). No specific prevalence information is available from the National Health Survey on Alzheimer's disease, a major cause of mortality within this category.

Mortality

Nervous system disorders were the underlying cause of 4,622 deaths in 2002. Alzheimer's disease accounted for 40% of these deaths, followed by Parkinson's disease (21%) and MND (11%).

There has been a significant increase in the death rate for nervous system disorders over the last several decades. The age-standardised rate increased from 13.3 deaths per 100,000 persons (after adjusting for coding changes) in 1979 to 23.0 deaths per 100,000 persons in 2002. Alzheimer's disease is responsible for much of the increase in death rates for the nervous system (Figure 2.46).



Notes

1. Standardised to the 2001 Australian population. Codes used were ICD-10 (ICD-9): Alzheimer's disease G30 (331.0), Parkinson's disease G20–G22 (332), motor neurone disease G12.2 (335.2), epilepsy G40–G41 (345), multiple sclerosis G35 (340), muscular dystrophy G71.0 (359.1), meningitis G00–G03 (320–322).
2. The age-standardised rates for ICD-9 data (1979–1996) have been adjusted by the appropriate comparability factors to facilitate comparisons with ICD-10 (1997–2002) data.
3. The comparability factors used were: 1.48 for Alzheimer's disease, 0.99 for Parkinson's disease, 1.13 for motor neurone disease, 1.06 for epilepsy and 0.88 for multiple sclerosis. The numbers for muscular dystrophy and meningitis were too small to calculate a reliable comparability factor.

Source: AIHW National Mortality Database.

Figure 2.46: Trends in death rates for common nervous system diseases, 1979 to 2002

The majority of deaths from nervous system disorders occur in older ages. However, this category is also a leading cause of death at younger ages, although the numbers are small (Table 2.16). Fatal nervous system diseases in the younger age groups include spinal muscular atrophy and infantile cerebral palsy. Epilepsy and muscular dystrophy were major contributors to these deaths among those aged 15–44.

Previous editions of *Australia's Health* (2000 and 2002) have provided specific information on dementias (including Alzheimer's disease), epilepsy, Parkinson's disease and MS. This edition focuses on MND.

Motor neurone disease

MND refers to a group of degenerative diseases affecting the nerves (motor neurones) which transmit instructions from the brain to the spinal cord and from there to the muscles. The disease causes progressive weakness and wasting of the muscles, impairing a wide range of functions such as moving, talking and breathing. Symptoms depend on which groups of motor neurones are affected first.

Those who develop the disease are generally not mentally impaired, their senses are not affected, and they preserve control of bladder, bowel and sexual functions (NINDS 2003; Brown 1998).

The disease progresses rapidly and survival is usually around three to five years, but can be up to 10 years or (in a few cases) more. Death can occur from respiratory failure or cardiac arrhythmia as a result of progressive muscle weakening (ATSDR 2002).

MND is the third largest cause of nervous system mortality after Alzheimer's disease and Parkinson's disease (Figure 2.46). Incidence and prevalence data are not readily available, but because of the rapid progression of the disease, mortality may reasonably reflect patterns of incidence. The cause of MND is unknown and there is currently no cure.

Males are more likely to develop MND than females. This difference is reflected in death rates, 3.2 deaths per 100,000 males and 1.9 deaths per 100,000 females in 2002. Although the disease can affect a person at any age, over 90% of deaths occur in people aged 45 and above.

Mortality from MND has increased significantly in Australia and other western countries since the late 1950s and the reasons for this are not known (ATSDR 2002).

Nervous system disorders burden

Disorders of the nervous system were estimated to account for 9% of the disease burden in Australia in 1996, 4% of years of life lost due to premature mortality (YLL) and 16% of years of 'healthy' life lost due to poor health or disability (YLD) (AIHW: Mathers et al. 1999).

Dental problems

Dental problems are common and there are two main types: dental caries (tooth decay) and periodontal (gum) disease. This section focuses only on dental caries.

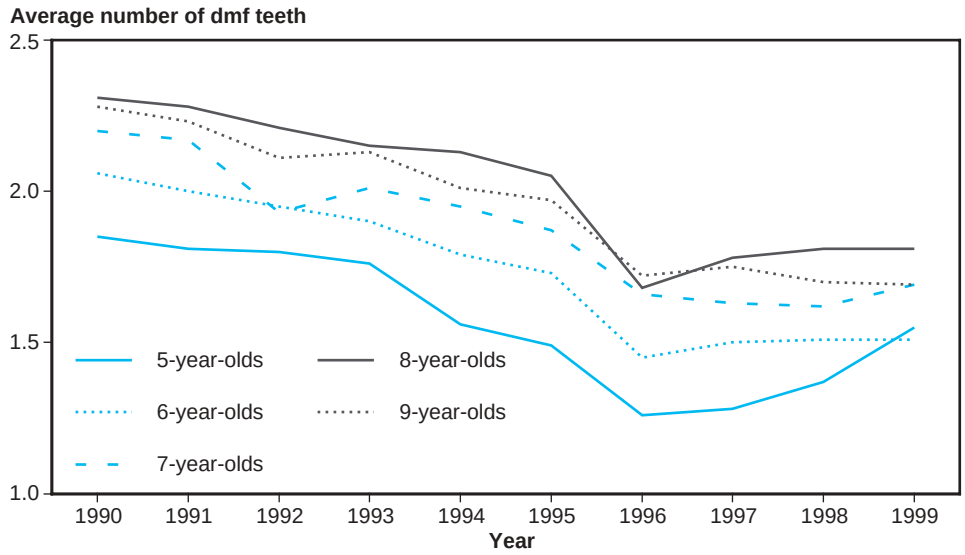
Information about children's dental problems is collected in the Child Dental Health Survey, a surveillance activity undertaken by the AIHW Dental Statistics and Research Unit. This is an annual survey of children examined through the school dental services administered by each state and territory. The data for the Child Dental Health Survey

are derived from the routine examinations of children enrolled in the service. For adults, information on dental problems is available from a number of national surveys.

A useful indicator of tooth decay is the average number of decayed, missing or filled teeth. For 'baby' or primary (deciduous) teeth in children, this number is put into a score known as 'dmft', and for permanent teeth the score is known as 'DMFT'. Because these scores tend to be concentrated at the lower end, dental health levels can also be monitored by focusing on those with a significant degree of tooth decay.

Decayed, missing and filled teeth

Tooth decay among children has greatly declined over the levels first observed in 1977, but it is now apparent that dental improvements have stalled in older children and that the caries experience of younger children is increasing. For example, the average dmft for 5–9-year-olds improved markedly between 1989 and 1996, but between 1996 and 1999 it increased for all but the 9-year-olds (Figure 2.47). On the other hand, DMFT scores have levelled off in recent years and between 1996 and 1999, only 12- and 13-year-olds showed reductions in decay experience.

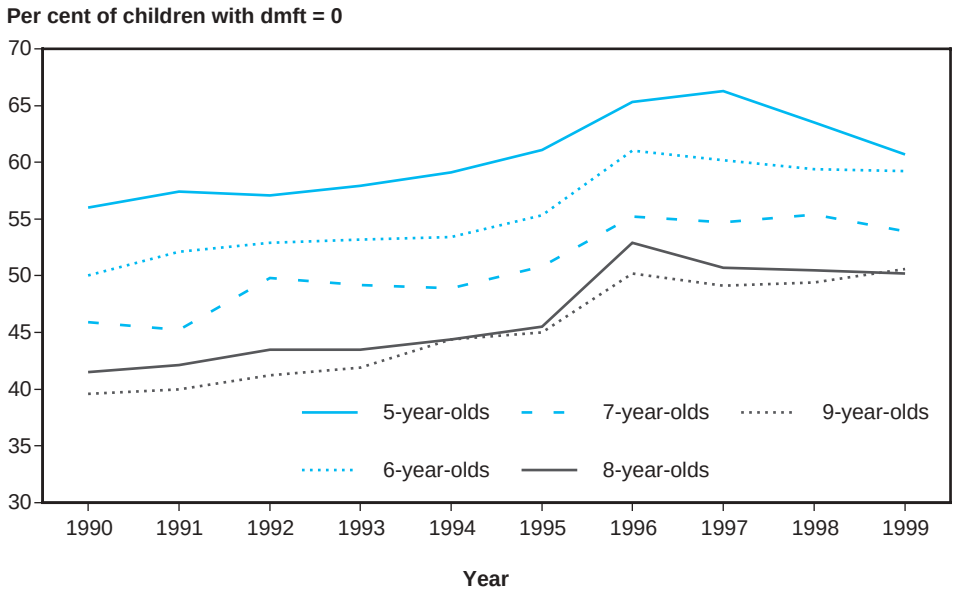


Source: Child Dental Health Surveys.

Figure 2.47: Trends in average number of decayed, missing or filled primary (deciduous) teeth (dmft), 1990 to 1999

The pattern in dmft is mirrored by the underlying trend in the proportion of 5–9-year-old children presenting to school dental services with no current or previous decay in their deciduous teeth, that is, no dmft (Figure 2.48). The proportion increased from 1990, peaking in 1996 for 6–9-year-olds and in 1997 for 5-year-olds, with most of the age groups showing a modest decline after that. The information from Figure 2.47 and Figure 2.48 indicates that the increases in average number of clinically detectable,

untreated, decayed teeth, seen from 1996 onwards, are a result of more children presenting with decay, rather than children with previous decay simply presenting with more. The rates of deciduous caries among Australian children were historically low up to 1996, but the change since then is significant.



Note: dmft = decayed, missing or filled primary (deciduous) teeth.

Source: Child Dental Health Surveys.

Figure 2.48: Proportion of children with no decayed, missing or filled primary (deciduous) teeth (dmft), 1990 to 1999

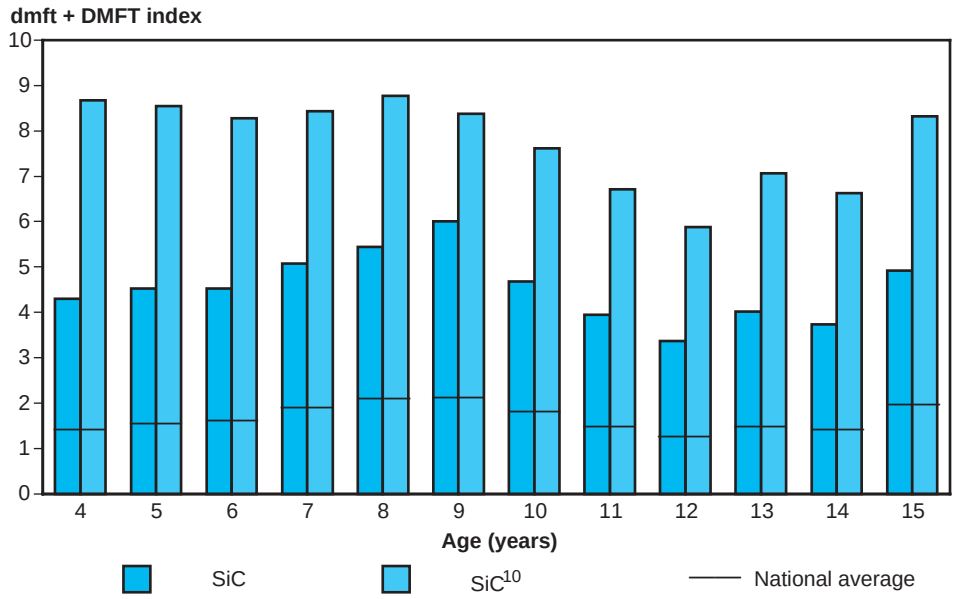
Significant caries index

A small minority of Australian children experience a considerable caries burden. Their dental burden is illustrated in Figure 2.49 by using the significant caries index (SiC). The index is calculated by averaging dmft or DMFT scores of the one-third of the population with the highest caries experience. A modified index, SiC^{10}, based on the 10% of the population with the highest caries experience, draws further attention to the extent of the problem.

The SiC in 1999 ranged between 3.4 and 6.0 affected teeth for the combined deciduous and permanent dentition of 4–15-year-olds (Figure 2.49). The SiC^{10} scores range from 5.9 affected teeth (12-year-olds) to almost 8.8 (8-year-olds).

Prevention of tooth decay

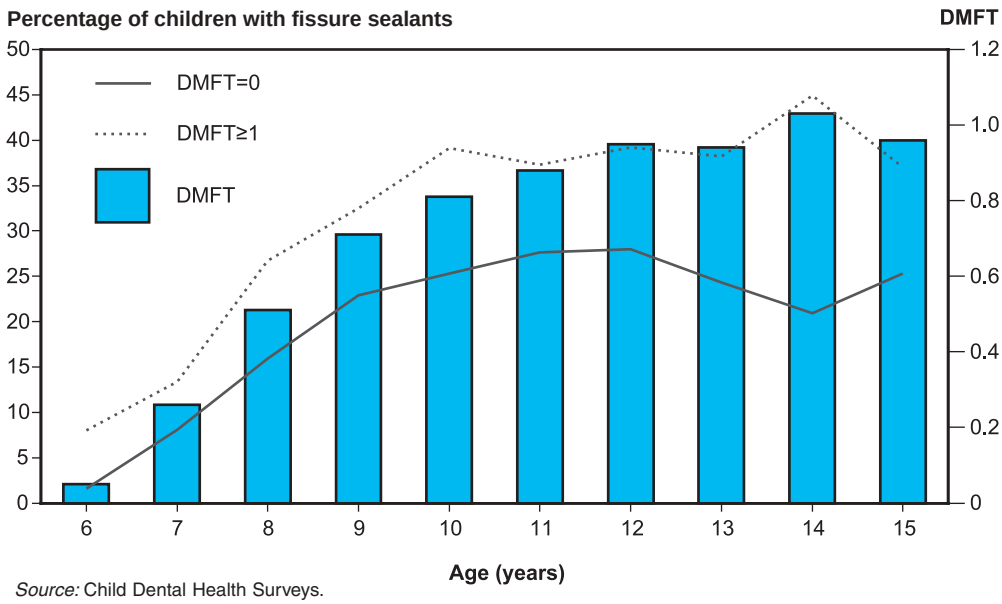
One of the main ways to prevent tooth decay in children is to apply sealant to the fissures of teeth considered to be 'at risk'. The average number of fissure sealants present in Australian children increases with age (see Figure 2.50). In 1999, approximately 32% of 12-year-old children had at least one fissure sealant.



Note: dmft = decayed, missing or filled primary (deciduous) teeth; DMFT = decayed, missing or filled permanent teeth.

Source: Child Dental Health Surveys.

Figure 2.49: Significant caries indices (SiC and SiC[10]) and national averages for the number of decayed, missing or filled primary (deciduous) teeth and permanent teeth in children, 1999



Source: Child Dental Health Surveys.

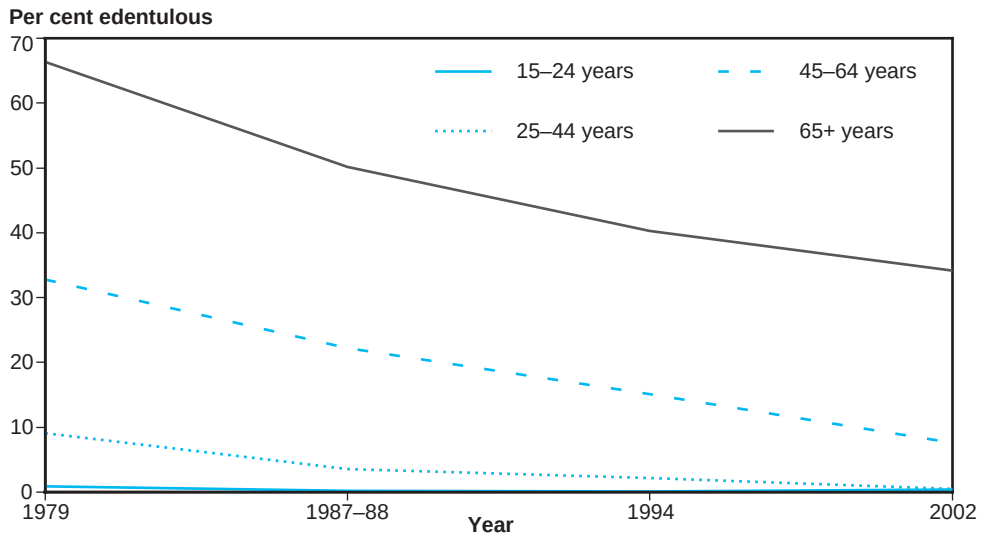
Figure 2.50: Fissure sealants and caries experience among children, 1999

For every age between 6 to 15 years, children with permanent caries experience (DMFT≥ 1) were considerably more likely to have a fissure sealant than children with no permanent caries experience (DMFT = 0). This reflects the targeting of fissure sealants to children deemed to be more at risk of being affected by future dental decay.

Trends in edentulism

Edentulism—the loss of all natural teeth—is a fundamental indicator of oral health status. It is both an endpoint of oral disease experienced over the life course and the consequence of its treatment by dental extraction. Hence, it reflects both the underlying trends in oral disease and varying access to dental treatment.

The prevalence of edentulism has rapidly declined in Australia during the last three decades. In 1979, approximately one-fifth (20.5%) of individuals aged 15 or older were edentulous. By the time of the National Oral Health Survey in 1987–88, the prevalence had halved to 11.8%. Subsequent National Dental Telephone Interview Surveys, conducted in 1994 and 2002, revealed continuing declines to 10.7% and 8.7%, respectively. While edentulism was consistently greater in older age groups, downward trends were observed across all age groups (Fig 2.51). Some of this decline is explained by changing dental treatment approaches over the past half-century, during which patients and dentists increasingly chose to treat dental diseases by means other than extraction.



Source: National Oral Health Surveys; National Dental Telephone Surveys.

Fig 2.51: Trends in edentulism, 1979 to 2002

Regardless of the factors driving this reduction, the declining rate of edentulism has important implications for the oral health of the Australian population and the delivery of dental services, particularly among older Australians. For example, as more people retain teeth, those teeth continue to be susceptible to decay and gum disease, with the consequence that a growing number of Australians have an ongoing need for preventive and restorative dental treatment throughout their lifetime.

2.7 Communicable diseases

Communicable diseases are illnesses due to specific infectious agents or their toxic products. Bacteria cause diseases such as pertussis (whooping cough) and tuberculosis; viruses cause diseases such as measles, influenza and AIDS; fungi are responsible for conditions such as tinea; protozoan parasites cause a variety of diseases including malaria; and bacterial toxins are responsible for conditions such as some forms of food poisoning. Infestations of larger parasites such as head lice as well as diseases such as transmissible spongiform encephalopathies (TSEs), which are spread through infectious particles, are also regarded as communicable diseases.

The impact or status of communicable diseases may be assessed by measuring a variety of factors such as how commonly they occur, their virulence, transmission rates, herd immunity, recovery rates and survival. However, several of these factors are difficult to measure directly. Therefore, indicators such as disease notifications, hospital separations and cause of death data are used to monitor communicable diseases.

Notification is the surveillance method used in Australia, coordinated under the National Notifiable Diseases Surveillance System (NNDSS). This system compiles information on more than 50 communicable diseases (see Box 2.7). Information on hospital separations and causes of death is available from the National Hospital Morbidity Database and National Mortality Database respectively. Self-reports, visits to GPs, laboratory investigations and special surveys are other useful sources of information but have not been integrated into the communicable diseases surveillance systems.

Box 2.7: Disease notification in Australia

A disease may be made notifiable to state and territory health authorities depending on its significance to public health. Information on more than 50 notifiable communicable diseases is available from the National Notifiable Diseases Surveillance System.

Surveillance of communicable diseases varies between jurisdictions, as each state and territory has specific requirements under their public health legislation for notification by medical practitioners, laboratories and hospitals. The notifiable diseases and the case definitions may also vary between jurisdictions.

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

Following a brief overview of communicable diseases, this section presents detailed information on various communicable diseases according to major modes of transmission. These are respiratory infections, bloodborne diseases, sexually transmitted infections, gastrointestinal infections, vectorborne diseases and other bacterial infections. Vaccine preventable diseases are also discussed, detailing the outcomes of prevention and control of communicable diseases in Australia through vaccination. Finally, Creutzfeldt-Jakob disease (CJD) and similar diseases are discussed, as well as emerging infectious diseases, such as severe acute respiratory syndrome (SARS) and avian influenza subtype H_5N_1.

Trends in communicable diseases

Communicable diseases were responsible for a large proportion of mortality and morbidity in Australia in the early part of the 20th century. Their incidence and associated morbidity and mortality have declined significantly, mainly due to improvements in hygiene (building on advances begun in the 19th century), and the introduction of antibiotics and mass immunisations. However, mortality associated with influenza and pneumonia remains high in the older age groups. The threat of resurgence of communicable diseases also remains.

Disease notifications and mortality data are used to illustrate the status of communicable diseases in Australia.

Disease notifications

There were 100,684 notifications of communicable diseases to the NNDSS in 2002. Major diseases notified were: bloodborne diseases, gastrointestinal diseases, sexually transmissible diseases, vaccine-preventable diseases, vectorborne diseases and zoonoses. Bacterial infections such as legionellosis, leprosy, meningococcal infection and tuberculosis were also notified.

The category most commonly notified was that of sexually transmissible infections (STIs), followed by gastrointestinal diseases and bloodborne diseases. The number of NNDSS notifications has increased to more than threefold since the establishment of the system in 1990, but some of this increase is due to expansion in the list of notifiable diseases. Reductions in notifications have occurred for several communicable diseases, in particular vaccine-preventable diseases (Table 2.25).

Table 2.25: Comparisons of maximum and current NNDSS[(a)] notifications of selected communicable diseases in Australia since 1991

Infection	Maximum (NNDSS) Number	Maximum (NNDSS) Year	2002 (NNDSS)	Reduction (%)
Measles	4,805	1994	31	99.4
Rubella	5,750	1995	255	95.6
Haemophillus influenzae type b (Hib)	533	1991	29	94.6
Hepatitis A	3,044	1997	388	87.3
Pertussis	10,828	1997	5,388	50.2
Hepatitis C (unspecified)	19,532	2001	15,981	18.2
Hepatitis B	8,413	2001	6,916	17.8
Tuberculosis	1,143	1999	1,028	10.1
Salmonellosis	7,756	2002	7,756	0
Cryptosporidiosis	3,255	2002	3,255	0
Meningococcal infection	684	2002	684	0

(a) NNDSS = National Notifiable Diseases Surveillance System.

Note: Maximum (NNDSS) denotes maximum number of notifications since the establishment of the NNDSS; 2002 (NNDSS) denotes the latest count.

Source: Yohannes et al. 2004.

Mortality

Almost 5,000 deaths in 2002 (around 3.7% of all deaths in Australia that year) were due to communicable diseases, an age-standardised death rate of 24.5 per 100,000 persons.

Deaths were concentrated in the older age groups, reaching a high of 811 per 100,000 among those aged 85 and above.

Acute respiratory infections

Acute respiratory infections, or ARIs (ICD-10 codes J00–J22)—including upper and lower respiratory tract infections, influenza and pneumonia—are a large cause of acute illness, hospitalisation and mortality in Australia. Several types of infectious agents cause ARI, such as influenza viruses, *Streptococcus pneumoniae* and respiratory syncytial virus (RSV). People with chronic diseases, children, the elderly and Indigenous Australians are at increased risk for these infections.

Respiratory infections constitute the most frequently managed problem in general practice, with upper respiratory tract infections (URTI) accounting for 4.4% of all problems managed in 2002–03 (AIHW: Britt et al. 2003). This high rate is mainly due to influenza-like illnesses which annually affect between 10% and 20% of the general population. ARIs are also the most frequently managed new problem in primary care (5.1 URTI cases per 100 GP encounters in 2002–03).

A total of 126,075 hospital separations in 2001–02 had ARI listed as the principal diagnosis, a large proportion (42,492 separations) of these being children aged 0–4. Those aged 50 and above accounted for 40% of these separations. Most adult ARI hospitalisations are due to pneumonia and influenza. Other respiratory infections such as RSV and parainfluenza virus are major causes of child hospitalisation.

In 2002, ARIs were the underlying cause of 3,165 deaths (1,395 males, 1,770 females), making this group the leading cause of death from infectious diseases. Most of the ARI deaths are concentrated in older age groups, with an average age at death of 78.8 years for the males and 82.5 years for the females in 2002. The contrast between the age distributions relating to ARI hospital separations and ARI mortality is noteworthy.

The majority (97.4%) of ARI deaths in 2002 were due to influenza and pneumonia (ICD-10 codes J10–J18), with an age-standardised rate of 15.2 per 100,000 persons (Table 2.26). As a single category, influenza and pneumonia ranked ninth for females and eleventh for males among the most common causes of death.

Table 2.26: Death and hospital separation rates for influenza and pneumonia, 1997 to 2002

Mortality			Hospital separations		
Year	Influenza	Pneumonia	Year	Influenza	Pneumonia
1997	1.3	12.4	. .	. .	. .
1998	0.7	11.2	1997–98	21.25	354.32
1999	0.4	10.3	1998–99	15.53	338.92
2000	0.4	15.4	1999–00	13.67	319.94
2001	0.2	13.8	2000–01	12.36	305.93
2002	0.3	14.9	2001–02	9.41	311.59

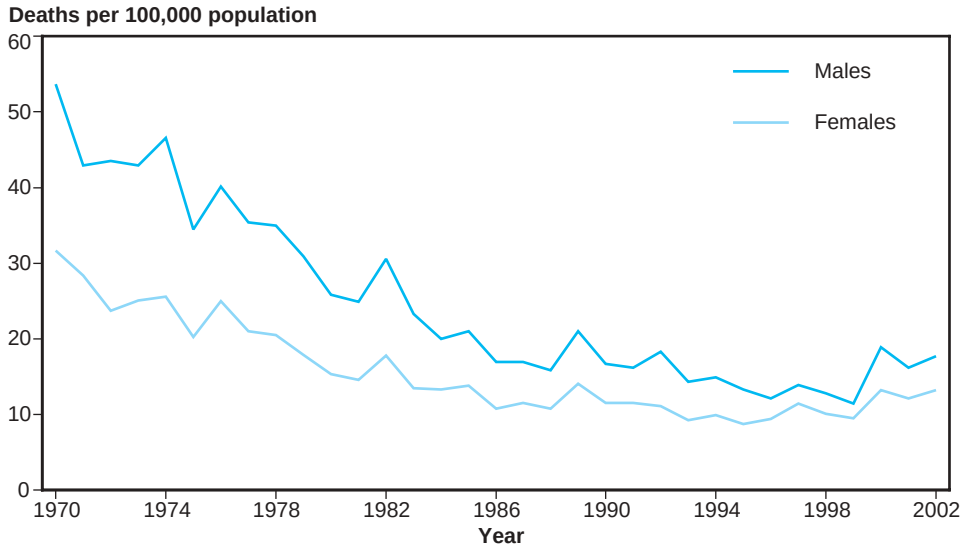
. . Not applicable.

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

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

Trends in pneumonia mortality

Time series since 1970 reveal interesting trends in pneumonia mortality. During the period 1970–86, death rates for pneumonia declined considerably, by almost half, with the decline slowing between 1987 and 1998. There has been some rise between 1999 and 2002, with most of the increase being among males (Figure 2.52).



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

Source: AIHW National Mortality Database.

Figure 2.52: Trends in pneumonia mortality, 1970 to 2002

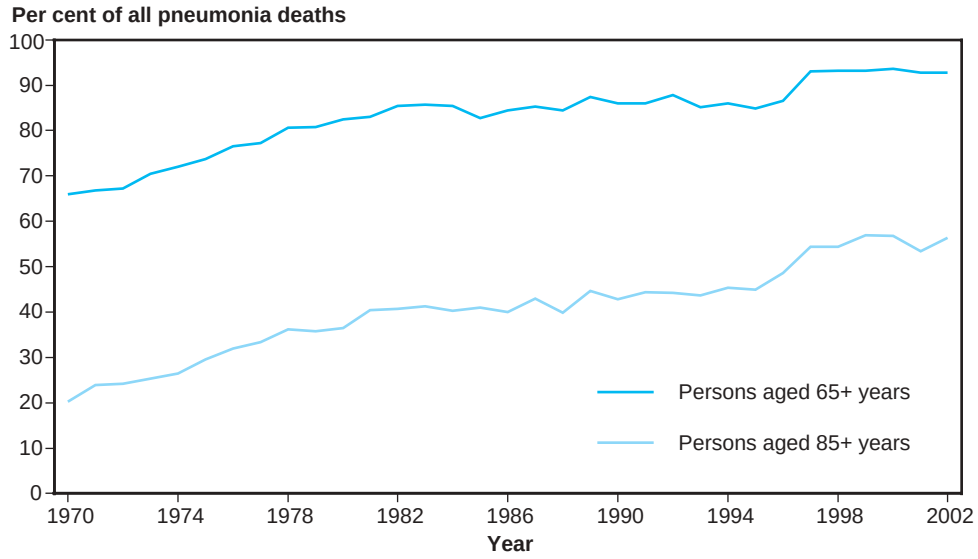
Another noteworthy trend is a shift in the age at which pneumonia deaths most commonly occur. In Australia, most of the pneumonia deaths occur among the elderly. Lately, the number of pneumonia deaths among those younger than 65 has declined to less than 200 deaths annually. At the same time, the proportion of pneumonia deaths that occur among the elderly (aged 85 and over) has increased considerably, from 20.2% in 1970 to 56.3% in 2002 (Figure 2.53). The latter trend is not fully explained by changes in the age structure of the population.

Vaccination

Vaccination provides a way to prevent some of the many cases of, and complications from, influenza and pneumonia. Annual influenza vaccines, particularly if the vaccine matches the circulating virus strains closely, are helpful in reducing morbidity and, for individuals at high risk of complications, mortality.

In 1999, the Australian Government initiated funding of the Influenza Vaccine Program for Older Australians. The program is designed to remove cost and physical barriers that may prevent older Australians from accessing influenza vaccines. Almost 77% of Australians aged 65 and above were vaccinated against influenza in 2002, a rate similar to that in 2001 (AIHW 2003f).

In October 2001, a vaccine was introduced for children at high risk of invasive pneumococcal disease, for persons of Aboriginal or Torres Strait Islander descent or for individuals with medical conditions predisposing to pneumococcal disease. In September 2003, the recommendation for vaccination was broadened to include all Australian children at 2, 4, and 6 months of age.



Source: AIHW National Mortality Database.

Figure 2.53: Changes in the age-specific proportions of pneumonia mortality, 1970 to 2002

Bloodborne diseases

Bloodborne diseases are caused by infections spread via blood, blood products and body fluids. Although there are other modes of transmission, including sexual contact, blood is an important vehicle for the spread of these diseases, which include HIV/AIDS and viral hepatitis in particular.

HIV/AIDS

Acquired immune deficiency syndrome (AIDS) is caused by the human immunodeficiency virus (HIV). Through the destruction of key cells of the immune system, untreated HIV reduces human immune function to such a degree that ordinarily harmless pathogens and infections become deadly.

An estimated 13,120 people were living with HIV/AIDS in Australia in 2002. National surveillance indicates an increase in HIV diagnoses lately but the number of AIDS cases has remained relatively stable.

HIV infection and diagnosis

The number of new diagnoses of HIV infection in Australia (adjusted for multiple reporting) declined from 1,077 in 1993 to 657 in 1998, and then increased to 808 in 2002.

The number of newly acquired cases of HIV infection (the subset of cases of newly diagnosed HIV infection with evidence that it was acquired within the past 12 months) similarly declined to 151 in 1998, but increased to 241 in 2002. Newly acquired HIV infections represent a minimum estimate of rates of HIV transmission.

The vast majority of new HIV diagnoses were among males with a history of homosexual contact; relatively small numbers were attributed to injecting drug use or heterosexual contact. HIV prevalence remained below 1% among each of the following: those attending needle and syringe programs, those entering prison, and those individuals with a history of heterosexual contact only who were seen through sexual health clinics.

AIDS prevalence, survival and mortality

By 31 December 2002, a cumulative total of 9,083 AIDS cases and 6,272 deaths following AIDS had been notified in Australia. Between 1999 and 2002, AIDS incidence remained stable at around 200–250 cases per year.

Survival following AIDS increased from 17.4 months in 1993 to 38.4 months in 1999. Around 52% of people with HIV/AIDS were receiving anti-retroviral treatment in 2002.

HIV/AIDS was the underlying cause of 111 deaths (101 males and 10 females) in 2002. Deaths from HIV/AIDS peaked in 1993, and have since decreased annually by about 18% for males and 10% for females.

HIV/AIDS among Indigenous Australians

The rate of HIV/AIDS diagnosis in the Indigenous population was similar to that in the non-Indigenous population during 1998–2002. However, relatively higher proportions of new HIV diagnoses among Indigenous Australians were attributed to a history of heterosexual contact (37% versus 21% in other Australians) or injecting drug use (20% versus 4%).

Chronic viral hepatitis

Viruses are a significant cause of illness and hepatitis (inflammation of the liver). While some types of viral hepatitis may be cured, others lead to long-term morbidity.

In 2002, 390 cases of newly acquired hepatitis B infection were diagnosed in Australia, at an annual incidence rate of 2.0 per 100,000. The principal cause of morbidity and mortality from hepatitis B is its chronic nature. Chronic infection may lead to cirrhosis of the liver and liver cancer, usually over a prolonged period. The risk of chronic infection is greatest in those infected as infants, particularly in the perinatal period. Preventive efforts in Australia have focused on immunisation of all newborns since 2000.

An estimated 225,000 people were living with hepatitis C in Australia in 2002, with around 16,000 notifications of hepatitis C that year. The high numbers of newly acquired hepatitis C indicate continuing hepatitis C transmission, which occurs through injecting drug use (see also the section on needle and syringe programs in Chapter 6).

Hepatitis C was the underlying cause of 31 deaths (19 males and 12 females) in 2002. It was also the primary cause of liver disease for which 41 people received a liver transplant that year. Only 1% of persons infected with hepatitis C were receiving antiviral treatment in 2002.

Sexually transmitted infections

STI data are collected by the NNDSS, covering chlamydia, donovanosis, gonococcus and syphilis. There were 31,929 STI notifications in 2002, more than double the number in 1997 (15,335). Chlamydia was the most frequently reported infection, with 24,039 notifications in 2002, an increase of 20% over the previous year. The highest number of gonococcal infections since 1991 were also notified, 6,247 cases. The number of syphilis cases was 1,627 in 2002.

Gastrointestinal infections

Gastrointestinal infections that are notifiable in Australia include botulism, campylobacteriosis, cryptosporidiosis, haemolytic uraemic syndrome (HUS), hepatitis A and E, listeriosis, salmonellosis, shigellosis, shiga-like toxin-producing *E. coli*/verotoxigenic *E. coli* (SLTEC/VTEC) and typhoid. OzFoodNet, a collaborative effort of the Australian states and territories, undertakes enhanced surveillance of foodborne diseases across Australia.

There were 23,434 notifications of potentially foodborne diseases in 2002, about 7.7% more than the average of 21,761 over the previous four years (OzFoodNet 2003). It is widely recognised, however, that notified cases of gastrointestinal illness represent a small fraction of those that occur in the community.

The majority of gastrointestinal notifications were for campylobacteriosis (14,605) and salmonellosis (7,756). There were also notifications of other serious illnesses, including hepatitis A, listeriosis and HUS. Campylobacteriosis (excluding New South Wales) was notified at a rate of 112 cases per 100,000 persons. Salmonella infections, on the other hand, were notified at a rate of 39 cases per 100,000 persons.

Attributing the mode of gastrointestinal infection to specific sources is difficult due to unknown contributions from various modes of transmission. People may contract gastrointestinal infections via food, water, other people, the environment or animals. Despite the difficulties in identifying the pathways, transmission from food is estimated to account for millions of cases of gastroenteritis each year in Australia (Veitch & Hogg 1997).

Vectorborne diseases

This section presents NNDSS statistics on vectorborne diseases—most of them transmitted by the mosquito—in Australia. The notifications cover diseases caused by alpha viruses (Barmah Forest virus disease and Ross River virus disease), flaviviruses (dengue, Murray Valley encephalitis, Japanese encephalitis and Kunjin virus disease) and protozoans (malaria caused by *Plasmodium*).

Ross River virus

Infection with Ross River virus is the most commonly notified vectorborne disease in Australia (Table 2.27), with 1,447 notifications in 2002. Ross River virus infections show a seasonal pattern, with peak notifications in the first two quarters of every year. Crude rates were highest in the Northern Territory, and there was an outbreak of Ross River virus in Tasmania in 2002.

Barmah Forest virus

There were 896 notifications (a crude rate of 4.6 per 100,000 population) of Barmah Forest virus in 2002, the highest number recorded since 1995. As in previous years, the rates were highest in the Northern Territory and Queensland.

Malaria

Malaria cases notified in 2002 (a total of 466) were mostly from travellers returning from malaria-prone areas. However, 10 cases of malaria in 2002 were local in origin—the first outbreak of malaria in Australia since 1986 (Yohannes et al. 2004).

Dengue fever

A total of 219 cases of dengue fever were notified in 2002 (crude rate of 1.1 per 100,000 persons). Dengue is not endemic in Australia despite periodic outbreaks, and only 25 cases were acquired within Australia in 2002, all of them in Northern Queensland (Yohannes et al. 2004).

Table 2.27: Vectorborne disease notifications, 2002

Disease/infection	Number	Rate per 100,000
Ross River virus	1447	7.4
Barmah Forest virus	896	4.6
Malaria	466	2.4
Dengue fever	219	1.1

Source: Yohannes et al. 2004.

Other bacterial infections

Other bacterial infections—legionellosis, leprosy, meningococcal infection and tuberculosis (TB)—are notified to NNDSS as well. Australia has one of the lowest rates for TB, which is one of the leading international causes of death. There has been little change in the profile of TB in Australia over the last 10 years.

In 2002, a total of 1,028 cases of TB were notified in Australia, 80% of which were among persons born overseas (Samaan et al. 2003). There were 1,003 hospital separations with a principal diagnosis of tuberculosis in 2001–02, with slightly more hospital separations among females (53%) than males (47%). There were 70 TB deaths (36 males, 34 females) in 2002, an age-standardised rate of 0.4 per 100,000 persons.

Vaccine-preventable diseases

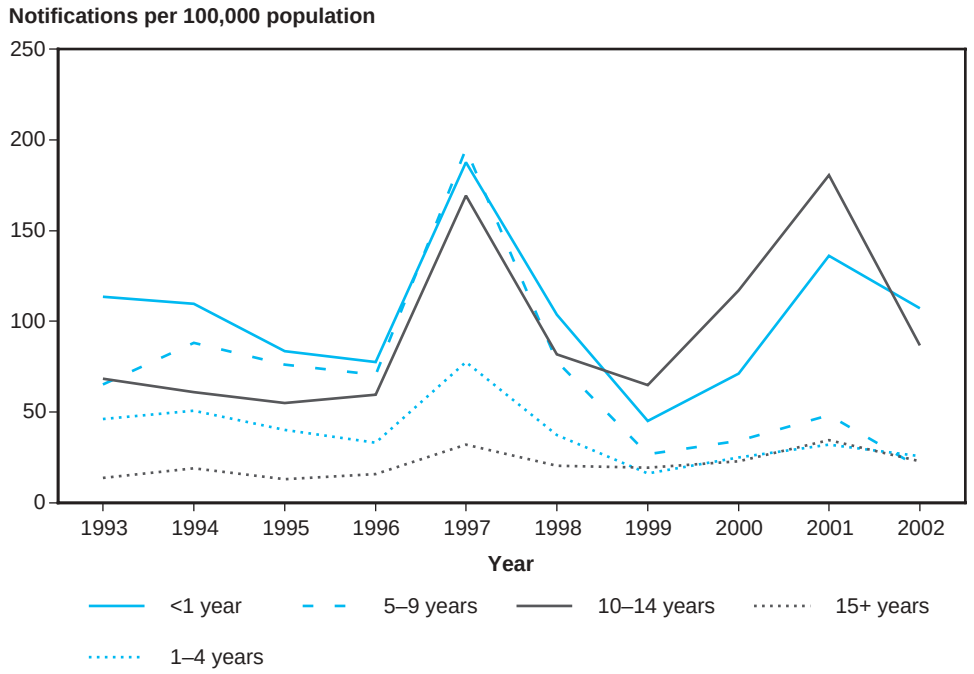
Certain communicable diseases are regarded as 'vaccine preventable' and are therefore recommended by the National Health and Medical Research Council (NHMRC) for routine vaccination or immunisation for children in Australia. The resulting Australian Standard Vaccination Schedule is implemented by the National Immunisation Committee. Recent changes which will further reduce the burden of vaccine preventable diseases in Australia occurred in September 2003 when a new schedule was announced. It adds routine meningococcal C vaccination at 12 months of age, amends the administration of diphtheria-tetanus-pertussis vaccine by removing the 18 month dose and requiring one in adolescence, and recommends vaccination for all children against varicella-zoster virus (chickenpox) and invasive pneumococcal disease.

Whooping cough (pertussis)

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

Since 1993, an average of 5,000 cases of pertussis has been notified annually, except in 1997 and 2001. In 2001, an epidemic of pertussis occurred with 9,166 cases notified (48.8 cases per 100,000 persons). A total of 5,388 cases of pertussis were reported by NNDSS in 2002.

During the 2001 epidemic year, the highest incidence (187 cases per 100,000 persons) was among children aged 10–14, a relatively under-immunised group now many years since vaccination. However, in 2002, rates in children less than one year of age (117.4 cases per 100,000) exceeded rates in 10–14-year-old children (85.3 cases per 100,000) for the first time since 1998. This was due to a large fall in notifications in the older age group and a smaller reduction in the infant rate. Most infant notifications (81%) were in children aged less than 6 months of age, with peak notifications occurring in those aged 2 to 4 months (242 cases per 100,000), infants too young to have received more than one dose of vaccine.



Source: National Notifiable Diseases Surveillance System.

Figure 2.54: Age-specific trends in pertussis notifications, 1993 to 2002

The new recommendation for a dose of whooping cough vaccine in adolescence should avert a high future burden of disease in this age group.

Whooping cough was the principal diagnosis in 631 hospital separations in 2001–02. Almost 70% of the separations were of infants. There were four deaths from whooping cough in 2002.

Tetanus

The tetanus toxoid is nearly 100% effective in protecting individuals. Since 1995, less than eight cases of tetanus were notified each year. In 2002, only three cases of tetanus were notified to the NNDSS although the spores of the tetanus organism are present everywhere. All cases occurred in adults aged 64 and above, consistent with the older age distribution of tetanus notifications in recent years.

Tetanus vaccination provides only individual-level protection against the disease, rather than herd (population) immunity, as the bacteria that cause tetanus are not spread from person to person but are widespread in the environment and can enter the body through cuts or abrasions. It is recommended that all Australians, especially older Australians, should be immunised against tetanus and ensure they receive a routine booster dose at age 50.

In the two–year period 2000–02, there were a total of 16 hospital separations with a principal diagnosis of tetanus. There have been less than five deaths from tetanus since 1999. In 2002, there was one death from tetanus.

Diphtheria

The diphtheria toxoid vaccine is highly effective in preventing diphtheria. Maintaining high rates of immunisation against the diphtheria organism is the only way to ensure that diphtheria infection in Australia remains a disease of the past (Gidding et al. 2000). A case of diphtheria infecting the skin in 2001, acquired in East Timor, was the first case reported since 1993 (Blumer et al. 2003).

Polio

Progress toward global eradication of polio has been dramatic. Both inactivated poliovirus vaccine and live attenuated poliovirus vaccines are highly effective in providing protection. There have been no confirmed cases of polio in Australia since 1967.

Measles

Effective surveillance mechanisms and high levels of immunisation have ensured that Australia is now in the World Health Organization's 'elimination phase' of measles control (WHO 2001b). There has been a large decline in the measles notification rate following the introduction of a two-dose vaccination schedule in 1994 (Gidding et al. 2001), the Measles Control Campaign in 1998 (Turnbull et al. 2001), and improved coverage as part of the routine childhood vaccination schedule. In 2001, only 141 cases were notified, with three outbreaks occurring when measles acquired overseas was spread among susceptible contacts in Australia. In 2002, there were 31 notifications of measles (a crude rate of 0.2 per 100,000 persons), the lowest number since national surveillance began in 1991.

All age groups had the lowest rates on record in 2002. Rates were highest in 0–4-year-olds (0.6 cases per 100,000 children), followed by the age group 20–24 (0.5 cases per 100,000 persons) and the age group 15–19 (0.4 cases per 100,000 persons). In 2001 and 2002 respectively, 41% and 35% of the reported cases were aged 20–29, whereas between 1993 and 1998 only 8% of cases were in this age range. Measles in Australia is now mainly acquired in countries where measles remains endemic, then imported here (McIntyre et al. 2000).

Hospital separations for measles are currently in decline, dropping from 61 separations in 1988–89 to 38 in 2001–02. No deaths have been attributed to measles since 1995, when there were five deaths.

Hib

Haemophilus influenzae type b (Hib) is a significant cause of morbidity and mortality in children worldwide. Vaccination of infants and young children with Hib conjugate vaccines has had a marked impact on the occurrence of the disease in Australia. Hib notifications in Australia have declined steeply from 533 cases reported in 1991 to 29 cases in 2002. Two deaths were recorded for Hib in 2002.

Mumps

Mumps is generally a mild viral childhood disease but it may rarely cause encephalitis (swelling of the brain), sterility, miscarriages or pancreatitis (Chin 2000). In Australia, there were 69 notifications of mumps in 2002, a rate of 0.4 per 100,000 persons. The highest rate was observed in the age group 0–4 (0.6 per 100,000); however, more than 70% of the notifications in 2002 were persons aged at least 15.

In 2001–02 there were 28 hospital separations with a principal diagnosis of mumps in Australia. There were 18 separations for males and 10 for females, with 43% for persons aged less than 20.

Rubella

A total of 5,750 cases of rubella were notified in Australia in 1995. Since then, the numbers have declined sharply. In 2002, there were 255 notifications (a crude rate of 1.3 per 100,000 persons). About 75% of notifications were for males. The highest rate in 2002 was for young adult males aged 20–24 (a crude rate of 12.9 per 100,000), a group with low rates of vaccination against the disease. There were nine hospital separations for rubella in 2001–02. No rubella deaths were reported in 2001 or 2002.

Rubella infection in pregnancy can lead to foetal death or miscarriage. Other major consequences of this infection are congenital disabilities and deformities including deafness, blindness, cardiovascular abnormalities or mental retardation. One case of congenital rubella infection acquired overseas was identified in 2002 and two similar cases occurred in 2001 (Forrest et al. 2003). In 2003, two cases of locally acquired congenital rubella infection were reported. Since May 1993, a total of 35 cases of congenital rubella infection have been identified among newborns, with 29 children affected by birth defects related to congenital rubella (Forrest et al. 2003).

Invasive meningococcal disease

Invasive meningococcal disease is a bacterial infection involving septicaemia or meningitis. Vaccination against meningococcal C disease was introduced in 2003 for all

Australian children at 12 months of age, with a large catch-up campaign to vaccinate children and adolescents up to age 19 (Cohen 2003).

The meningococcus bacterium occurs as 13 different types, five of which cause disease in humans. The most common forms in Australia are types B and C. There is no vaccination against type B, which accounted for 53.5% of the laboratory-confirmed meningococcal cases in 2002 (Tapsall 2003).

There were 684 notifications of meningococcal disease (a crude annual rate of 3.5 per 100,000 persons) in 2002. Notification rates were the highest in the age groups 0–4 and 15–19, with rates of 13.6 per 100,000 and 10.3 per 100,000 respectively.

In 2001–02, there were 756 hospital separations for meningococcal disease. Cases aged less than 25 accounted for most of these separations (80%). Meningococcal infections accounted for 48 deaths (31 males and 17 females) in 2002.

Invasive pneumococcal disease

Invasive pneumococcal disease (IPD) refers to invasive disease caused by infection with the bacteria *Streptococcus pneumoniae*. While the organism often causes ear infections and respiratory disease, invasive disease causes more serious illness such as septicaemia, meningitis or severe pneumonia.

Vaccination can provide protection against IPD caused by certain strains of the pneumococcal bacteria and routine vaccination is recommended for young children, those aged 65 and above, Indigenous Australians aged 50 and above, smokers and those who have medical conditions which increase the chance of infection.

In 2002, there were 2,271 notifications of IPD in Australia or 11.5 cases per 100,000 persons. The geographical distribution of IPD varied within states and territories, with the highest rates in central and northern Australia. Children aged less than 5 had the highest rates (56.8 cases per 100,000 persons) followed by adults aged more than 85 (51.7 cases per 100,000). In 2001–02, there were 2,393 hospital separations for IPD (12.2 separations per 100,000).

In 2001 and 2002, there were 80 deaths due to pneumonia, sepsis or meningitis attributed to pneumococcal bacteria. The highest rates of death due to pneumonia were in those aged over 60, while for meningitis the highest rates were in children aged less than 5.

Transmissible spongiform encephalopathies

Transmissible spongiform encephalopathies (TSEs) are a group of transmissible diseases in humans and animals, marked by a spongy (spongiform) deterioration of the brain (encephalus), which causes severe neurological symptoms leading to death. The most accepted scientific theory is that TSEs are caused by self-reproducing proteins known as prions.

Three most important forms of TSEs are:

- bovine spongiform encephalopathy (BSE)
- Creutzfeldt-Jakob disease (CJD)
- variant CJD (vCJD).

The Australian National CJD Registry undertakes surveillance and diagnosis of CJD, and monitors other human forms of TSEs. At the time of writing, the registry had recorded 479 cases of CJD since 1970 (Masters et al. 2002).

No cases of vCJD have been reported in Australia and stringent measures have been taken to restrict the import of products that may have been exposed to BSE.

Emerging infectious diseases

From early 2003, two infectious diseases of global significance have emerged: severe acute respiratory syndrome (SARS) and avian influenza subtype H_5N_1 ('bird flu'). SARS, caused by a coronavirus, developed into an international outbreak in 2003. During the outbreak, 8,098 cases were identified in numerous countries, a substantial proportion of which were among health care workers. In Australia, six suspected cases (four females, two males) of SARS were identified and reported to the World Health Organization. Only one of these was positive for the SARS coronavirus. All six suspected cases had come from overseas and no secondary transmission occurred. Australia mounted a national response including strengthening laboratory and hospital preparedness, instigating screening at border entry points and disseminating information to the public.

Widespread outbreaks of avian influenza have been reported in several Asian countries since last year. Cases of avian influenza H_5N_1 in humans were identified in Vietnam in October 2003, and approximately 30 human cases had been identified in Thailand and Vietnam as of March 2004. The outbreak was of public health importance due to the risk of combining genetic components of the avian influenza virus with a human influenza virus, leading to a new human pandemic strain. Australia has responded to the outbreak by strengthening quarantine measures, initiating pandemic influenza responses and monitoring the poultry industry for potential outbreaks.

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3 Determinants of health

An overview of health determinants in the wider context of health was shown in Figure 1.1 in Chapter 1. This chapter begins by discussing health determinants in general, their major types, and their relationships to health and to each other. It then provides information on the levels, trends and other patterns of those determinants for which there are adequate data.

What are health determinants?

The health of individuals and populations is influenced and determined by many factors acting in various combinations. The dominant view is that health is 'multicausal': healthiness, disease, disability and, ultimately, death are seen as the result of the interaction of human biology, lifestyle and environmental (including social) factors, modified by health interventions.

Health determinants can be described as those factors that raise or lower the level of health in a population or individual. Determinants help explain and predict trends in health and explain why some groups have better or worse health than others. They are the key to the prevention of disease, illness and injury.

Determinants may have positive or negative impacts. Factors such as cigarette smoking or low socioeconomic status increase the risk of ill health and are commonly termed 'risk factors'. Positive influences such as a high intake of fruit and vegetables are known as 'protective factors'. Unlike behaviours, some determinants such as age and sex clearly cannot be altered. Advancing age is associated with a greater risk for many diseases. Numerous diseases are sex-specific and for many others sex can be either a risk factor or a protective factor. Health interventions are covered in Chapter 6 and are not considered here.

For almost all risk and protective factors the associated effect is not 'all or nothing'. For risk factors, rather than there being one point at which risk begins, there is an increasing effect as the exposure increases. For example, each increment in a person's body weight above their 'optimal' level is associated with an increase in the risk of ill health. Although the increasing risk often starts at relatively low levels, the usual practice is to monitor a risk factor by reporting the proportion at the riskier end of the spectrum.

A framework for determinants

Determinants are in complex interplay and range from the very broad level, with many health and non-health effects, to the highly specific. They are often described as a web of causes, but they can also be thought of as part of broad causal 'pathways' or 'chains' that affect health. Figure 3.1 is a simple framework of determinants and their pathways, with the general direction of effects going from left to right.

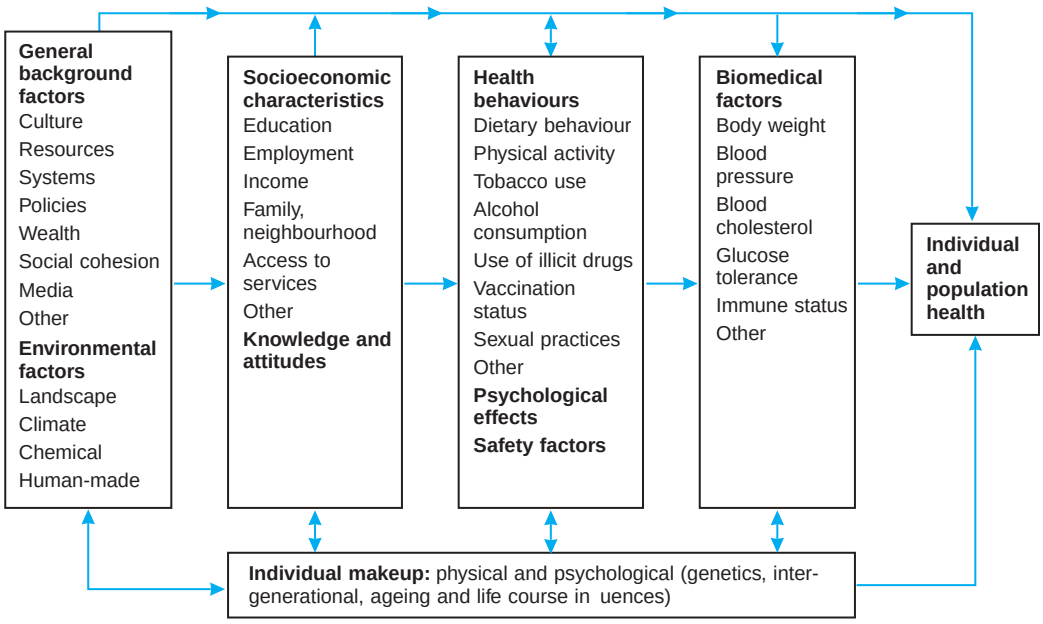


Figure 3.1: A conceptual framework for determinants of health

General background and environmental factors can determine the nature and degree of socioeconomic characteristics (left-hand boxes) and both can influence people's health behaviours, their psychological state and factors relating to safety (middle). These in turn can influence biomedical factors (shown at right), such as blood pressure and body weight, which may have health effects through various further pathways. At all stages along the path these various factors interact with an individual's makeup (bottom box). In addition, the factors within a box often interact and are highly related to each other. (Despite the general direction of these influences they can occur in reverse. For example, an individual's health can also influence their physical activity levels, employment status and wealth.) These groups of determinants are now discussed briefly.

General background factors (left-hand box) are those factors that affect virtually all people in society to some extent, although to varying degrees. These factors combine to influence the basic levels of security, safety, hygiene, nourishment, technology, information, freedom and morale of societies. It is difficult to put values and quantities on most of these broad factors, let alone measure them and assess their impact precisely. However, it is widely agreed that, at least up to a fair degree of societal development, they are a vital determinant of a population's health. They set the background level around which variations then occur between groups and individuals.

Environmental factors are confined here to the physical environment, such as the climate, the land, plant and animal life, and human-made factors such as chemical pollution and waste products. Among many things, these can affect a society's supply of primary goods,

and therefore its wealth, and they can influence where and how people live and spend their time. Large-scale environmental disruptions, such as human-induced climate change, can have major health implications in the longer term as well as in the short term.

Variations in **socioeconomic characteristics** are influenced by society's policies, structures and history, and can be affected by environmental factors as well. These variations can in turn lead to marked variations in health. Differences in people's levels of education and income, for example, along with attitudes and values gained from their families and social settings, can lead to strong differences in the opportunities and choices that affect their health.

Both general background factors and varying socioeconomic factors influence people's **health behaviours** and can have significant **psychological effects** and influence on **safety factors** (middle box). A particular health behaviour such as an individual's diet, for example, can result partly from the general availability and range of foods due to the system as a whole. It can also reflect a person's 'inherent' preferences modified by both cultural and family influences. Finally, it may further reflect the person's financial and political freedom to exercise those preferences.

A person's psychological state and behaviour clearly affect each other and both can in turn lead to biomedical changes or disease. Diseases such as asthma, for example, are believed to be often influenced by psychological factors (AIHW: Australian Centre for Asthma Monitoring 2003). It is also argued that various stressful aspects, such as depression, being socially isolated or less free to make decisions, can lead to problems such as heart disease, independent of any intermediary behavioural effects (Bunker et al. 2003).

As with all the factors mentioned, health behaviours tend to interact with each other and to influence a variety of **biomedical factors** (right-hand box). Both physical activity and diet, for example, can affect body weight, blood pressure and blood cholesterol. They can do this alone or, with greater effect, together. The biomedical factors listed in the box are only a selection and they are often highly interrelated. Excess body weight, high blood pressure and high blood cholesterol can all contribute to the risk of heart disease and amplify each other's effects if they occur together. In addition, obesity can in itself lead to high blood pressure and high blood cholesterol. Biomedical disturbances do not lead to ill health automatically or in a single step. They can pass through various further biological pathways before producing outward disease, providing further points for intervention. Both behavioural and biomedical risk factors tend to increase each other's effects when they occur together in an individual.

Finally, it is important to note that determinants act upon and are influenced by an **individual's makeup**, both physical and mental (bottom box). This makeup can greatly modify a person's response to other new or continuing determinants. It can be seen as the complex product of a person's genetic endowment, inter-generational effects, their ageing, and physical or social influences at various stages over their life course. These influences can become built into a person's makeup for various periods or for life. Some diseases, such as muscular dystrophy, result entirely from a person's genetic features, whereas most others reflect the interaction between those features and the many other influences mentioned here.

Information in this chapter is presented in four sections which correspond to those in Figure 3.1. These are biomedical and genetic factors, health behaviours, socioeconomic

factors and environmental factors. In each of these sections, available information on specific determinants is presented. However, the population health impact of individual risk factors varies, depending on their frequency in the population and relative effect on individual people. Therefore, Table 3.1 aims to give an overall perspective by providing an estimate of the relative importance in 1996 of most of the determinants included in this chapter. From this, tobacco smoking was estimated to cause the most premature death and illness, followed by physical inactivity and high blood pressure.

Table 3.1: Proportion of total disease burden attributed to selected risk factors, 1996

Risk factor	Males	Females
	(per cent)	
Tobacco smoking	12.1	6.8
Physical inactivity	6.0	7.5
High blood pressure	5.1	5.8
Alcohol harm	6.6	3.1
Alcohol benefit	–2.4	–3.2
Overweight	4.4	4.3
Lack of fruit/veg.	3.0	2.4
High blood cholesterol	3.2	1.9
Illicit drugs	2.2	1.3
Unsafe sex	1.1	0.7

Note: Attributable disability-adjusted life years (DALYs) as a proportion of total DALYs. One DALY equals one year of healthy life lost through premature death or living with disability due to illness or injury.

Source: AIHW: Mathers et al. 1999.

3.1 Biomedical factors

Body weight

The prevalence of obesity has risen dramatically worldwide and the World Health Organization (WHO) has called the increase a global epidemic. Australia is no exception to this increase.

Overweight, and in particular obesity, is associated with higher mortality and morbidity. Excess body fat increases the risk of developing a range of health problems including Type 2 diabetes, cardiovascular disease, high blood pressure, certain cancers, sleep apnoea, osteoarthritis, psychological disorders and social problems (WHO 2000). Children and adolescents who are overweight also have an increased risk of health problems. They have a greater likelihood of becoming overweight adults and of developing conditions such as Type 2 diabetes (Ludwig & Ebbeling 2001).

At the other end of the weight spectrum is underweight. While underweight and associated malnutrition is mainly a problem in developing countries, being underweight in developed countries is also associated with poor health.

Overweight was estimated to account for 4.3% of the total burden of disease in Australia in 1996 (AIHW: Mathers et al. 1999). The study that made this estimate did

not consider underweight, as it is not a common problem in Australia. Globally, childhood and maternal underweight is the risk factor responsible for the largest burden of disease, with overweight ranking tenth (Ezzati et al. 2002).

Overweight arises through an energy imbalance over a sustained period of time. While many factors may influence a person's weight, weight gain is essentially due to the energy intake from the diet being greater than the energy expended through physical activity. The energy imbalance need only be minor for weight gain to occur, and some people—due to genetic and biological factors—may be more likely to gain weight than others (WHO 2000). For more information, see the sections on dietary behaviour and physical activity in this chapter.

Prevalence and trends

Trends in body weight—whether based upon body mass index (BMI: see Box 3.1) or waist circumference—show that the prevalence of overweight and obesity has been increasing at an alarming rate over the last two decades. Comparisons of population groups show that all Australians are affected: children and adults, men and women, Indigenous and non-Indigenous Australians, and people from all socioeconomic backgrounds. Some groups are worse off than others, in particular Aboriginal and Torres Strait Islander people and people from the most disadvantaged socioeconomic groups.

Box 3.1 outlines issues in measuring and reporting on statistics on body weight. In the following section, results are from a number of surveys, using BMI derived from self-reported and measured height and weight, and waist circumference. Data sources are detailed in Table 3.2.

Table 3.2: Body weight data sources

Survey	Scope (as presented)	Measure of weight
1989–90 and 2001 National Health surveys	National, 18 years and over	Self-reported BMI
1980, 1983 and 1989 Risk Factor Prevalence surveys	Capital cities (states only for 1980, 1983), 25–64 years	Measured BMI Waist circumference
1995 National Nutrition Survey	Capital cities and other urban areas, 25–64 years	Measured BMI
1999–2000 Australian Diabetes, Obesity and Lifestyle Study	National, 25 years and over (for prevalence) Capital cities (excluding ACT), 25–64 years (for trends)	Measured BMI Waist circumference

Results based on self-reported data

The most recent national data based on self-reported height and weight come from the 2001 National Health Survey (NHS). From this survey, 2.4 million Australian adults were estimated to be obese (16% of men and 17% of women aged 18 years and over, with a BMI of 30 or more). A further 4.9 million Australian adults were estimated to be overweight but not obese (42% of men and 25% of women aged 18 years and over, with a BMI of 25 or more but less than 30). Only 1% of men and nearly 5% of women were considered to be underweight (a BMI less than 18.5).

Box 3.1: Classifying body weight

There are two main methods used for monitoring body weight: body mass index and waist circumference.

Body mass index

The most common population-level measure of body weight is the body mass index (BMI). BMI is calculated by dividing weight in kilograms by the square of height in metres (kg/m^2). Classifications of body weight are based primarily on the association between BMI and illness and mortality, and are the standard recommended by the WHO and are included in the National Health Data Dictionary.

Weight categories for adults aged 18 years and over based on BMI are:

- *underweight (BMI < 18.5)*
- *healthy weight (BMI ≥ 18.5 and BMI < 25)*
- *overweight (BMI ≥ 25)*
  - *overweight but not obese (BMI ≥ 25 and BMI < 30)*
  - *obese (BMI ≥ 30).*

This classification may not be suitable for all ethnic groups, who may have equivalent levels of risk at lower BMI (for example Asians) or higher BMI (for example Polynesians).

For children and adolescents aged 2–17 years, Cole et al. (2000) have developed a separate classification of overweight and obesity based on age and sex.

Waist circumference

For monitoring overweight, waist circumference is a useful addition to BMI because abdominal fat mass can vary greatly within a narrow range of total body fat or BMI. The National Health Data Dictionary *defines waist circumference cut-offs for increased and substantially increased risk of ill health. Waist circumferences of 94 cm or more in men and 80 cm or more in women indicate increased risk (referred to here as abdominal overweight). Waist circumferences of 102 cm or more in men and 88 cm or more in women indicate substantially increased risk (referred to here as abdominal obesity). This classification is not suitable for use in people aged less than 18 years and the cut-off points may not be suitable for all ethnic groups.*

Self-reported versus measured data

BMI is more commonly used than waist circumference as a measure of overweight and obesity in the population (particularly in self-report surveys), as people are more likely to know their height and weight than their waist circumference.

Height and weight data may be collected in surveys as measured or self-reported data. Previous comparisons have shown that people tend to overestimate their height and underestimate their weight, leading to an underestimate of BMI. Thus, rates of overweight and obesity based on self-reported data are likely to be underestimates of the true prevalence, and should not be directly compared with rates based on measured data.

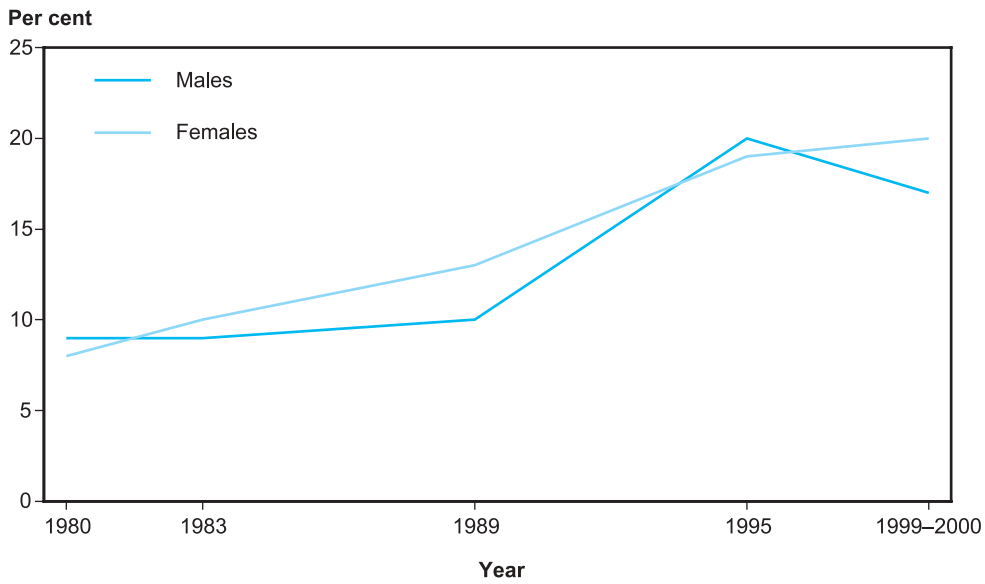
Sources: ABS 1998; AIHW: Waters 1993; Cole et al. 2000; Flood et al. 2000; NHDC 2003; Niedhammer et al. 2000; WHO 2000.

The prevalence of overweight increased significantly over time. At the more severe end of the spectrum—obesity—the prevalence increased from 9% to 16% in men and from 10% to 17% in women between 1989–90 and 2001.

Results based on measured data

Measured height and weight were collected in the 1999–2000 Australian Diabetes, Obesity and Lifestyle Study (AusDiab). Analysis of this survey found that 19% of men and 22% of women aged 25 years and over were obese (a BMI of 30 or more) and an additional 48% of men and 30% of women were overweight but not obese (a BMI of 25 or more but less than 30). The prevalence of underweight (a BMI less than 18.5) was less than 1% for men and nearly 2% for women.

Trends in the urban population of Australia show that between 1980 and 1999–2000, the proportion of men aged 25–64 who were obese rose from 9% to 17%. Over this same period, the rate of obesity among women aged 25–64 increased from 8% to 20% (Figure 3.2).



Notes

1. Age-standardised to the 2001 Australian population.
2. Urban areas only.
3. People aged 25–64 years.
4. Based on measured data.

Source: AIHW analysis of the 1980, 1983 and 1989 Risk Factor Prevalence surveys, the 1995 National Nutrition Survey and the 1999–2000 Australian Diabetes, Obesity and Lifestyle Study.

Figure 3.2: Proportion of adults who are obese (BMI of 30 or more), 1980 to 1999–2000

Comparison of results based on self-reported and measured data

The results given above based on self-reported and measured data cannot be directly compared: as well as systematic differences in the two types of data (mentioned in Box 3.1), the two data sets here apply to different age ranges and the prevalence of overweight relates to age. However, additional analysis of the 2001 NHS shows that 61% of men and 45% of women aged 25 years and over were classified as overweight (a BMI of 25 or more) based on self-reported information. Results from the 1999–2000 AusDiab showed that 67% of men and 52% of women aged 25 years and over were overweight based upon measured BMI. These differing results support previous studies which showed that rates of overweight derived from self-reported data are likely to be underestimates (see Box 3.1).

Results based on waist circumference

Abdominal obesity is an independent risk factor for Type 2 diabetes, coronary heart disease and other health disorders (WHO 2000). Waist circumference is a useful indicator of abdominal fat. More than a quarter of men (27%) (waist circumference of 102 cm or more) and over a third of women (34%) (waist circumference of 88 cm or more) aged 25 years and over were classified as abdominally obese in 1999–2000. A further 28% of men and 22% of women were classified as abdominally overweight but not obese (a waist circumference of 94 cm or more but less than 102 cm for men, and 80 cm or more but less than 88 cm for women).

Trends in the urban population of Australians aged 25–69 years show that from 1989 to 1999–2000 the prevalence of abdominal obesity increased from 14% to 21% in men and from 16% to 28% in women (AIHW: Dixon & Waters 2003).

Comparisons by population groups

Sex and age

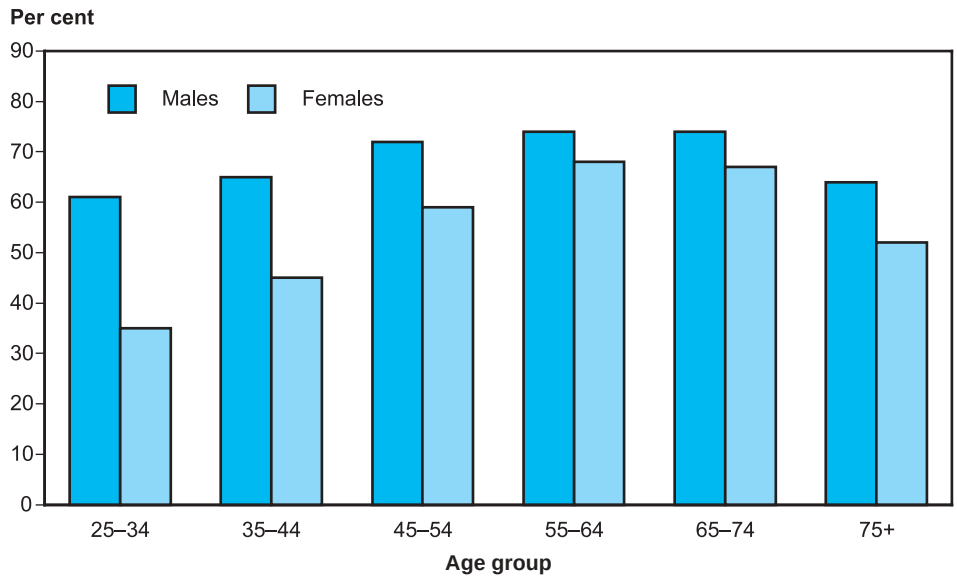
Estimates based on BMI from the 1999–2000 AusDiab showed that men were more likely than women to be overweight (67% versus 52%), although rates of obesity were similar (19% for men and 22% for women).

Among adults, the prevalence of obesity was highest among 55–64-year-olds (29%) with the lowest rates in 25–34-year-olds (15%) and people aged 75 years and over (14%). Results for all overweight people show a similar pattern, with the prevalence of overweight increasing with age up to 65–74 years, and declining thereafter (Figure 3.3).

Older Australians who are obese are a group of particular concern as excess weight may impair mobility, participation in social activities and mental health. Unlike age patterns in BMI, the prevalence of abdominal obesity as measured by waist circumference continues to rise with increasing age (AIHW: Bennett et al. 2004).

Children and adolescents

In 1995, the prevalence of overweight among children and adolescents aged 2–18 years was 19.5% for boys and 21.1% for girls. The proportion of overweight was greatest among boys aged 12–15 years (26.1%) and girls aged 7–11 years (23.5%) (Magarey et al. 2001).



Note: Based on measured data.

Source: AIHW analysis of the 1999–2000 Australian Diabetes, Obesity and Lifestyle Study.

Figure 3.3: Proportion of people who are overweight (BMI of 25 or more), 1999–2000

For children and adolescents aged 7–15 years, obesity increased from 1.4% of boys and 1.2% of girls in 1985 to 4.7% of boys and 5.5% of girls in 1995. The proportions of boys and girls that were overweight but not obese also increased from 1985 to 1995: from 9.3% to 15.3% for boys and from 10.6% to 16.0% for girls (Magarey et al. 2001).

Socioeconomic status

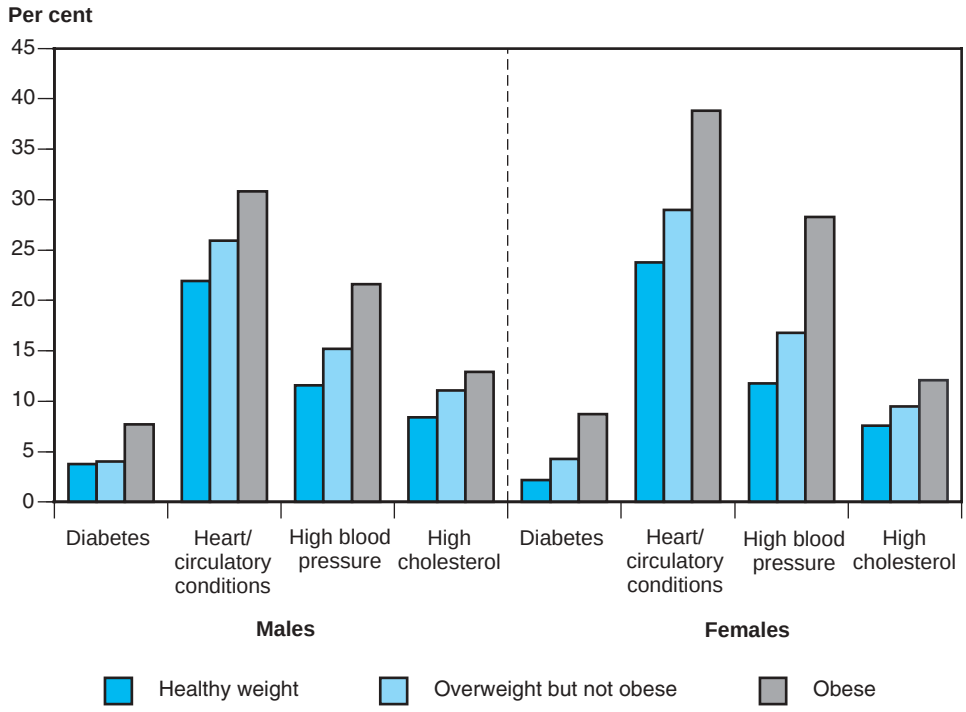
Estimates from the 2001 NHS for adults aged 20 years and over showed that women in the most disadvantaged socioeconomic group had nearly double the rate of obesity (23%) of those in the most advantaged group (12%). Men in the most disadvantaged group were also more likely to be obese than those in the most advantaged group (19% compared with 13%) (AIHW: O'Brien & Webbie 2003).

Aboriginal and Torres Strait Islander people

The proportions of people that were overweight but not obese was similar for Indigenous people and other Australians in 2001 (32% and 34% respectively), unchanged from 1995 for both of these groups. However, Aboriginal and Torres Strait Islander people were almost twice as likely to be obese—31% of Indigenous Australians compared with 16% of non-Indigenous Australians. A marked increase in the prevalence of obesity was seen over this period for both Aboriginal and Torres Strait Islander people (from 24% to 31%) and other Australians (from 12% to 16%). These results are based upon BMI derived from self-reported height and weight and apply to Australians living in non-remote areas only (AIHW: O'Brien & Webbie 2003).

Long-term health conditions

Diabetes was reported four times as often among obese women than among healthy weight women (8.7% and 2.2% respectively) in the 2001 NHS. Obese men were twice as likely to report diabetes as healthy weight men (7.7% compared with 3.8%) (AIHW: O'Brien & Webbie 2004). Similarly, in 2001 heart and circulatory conditions were reported more often among obese men and women than their healthy weight counterparts. In particular, obese people were more likely to report having high blood pressure than people of healthy weight (28.3% compared with 11.8% for women, 21.6% versus 11.6% for men) and high blood cholesterol was reported more commonly among obese people than those of healthy weight (Figure 3.4). These survey data do not allow conclusions to be made about cause and effect but they do highlight the excess burden of poor health experienced by overweight and particularly obese Australians.



Notes

1. Age-standardised to the 2001 Australian population.
2. Diabetes, high blood pressure and high blood cholesterol results for persons aged 25 years and over. Heart/ circulatory conditions for persons aged 20 years and over.
3. Based on self-reported data.

Source: AIHW analysis of the 2001 National Health Survey.

Figure 3.4: Proportion of adults with selected conditions by BMI category, 2001

International comparisons

While there is a large amount of international data on body weight, it is difficult to find directly comparable information. However, comparable self-reported data show that the prevalence of obesity among Australian adults aged 25–64 years (18%) is lower than for adults of the same age range in the United Kingdom or United States (both 22%). Data based on measured height and weight indicate that the prevalence of obesity is slightly higher among Australian adults aged 25–64 years (20%) than among adults of the same age in New Zealand (18%) but is twice as high as in Italy (9%) (AIHW: Dixon & Waters 2003).

Blood pressure

High blood pressure (also referred to as hypertension; see Box 3.2) is a major risk factor for coronary heart disease, stroke, heart failure and kidney failure. The risk of disease increases as the level of blood pressure increases. When high blood pressure is controlled, the risk of cardiovascular disease is reduced, but not necessarily to the levels of unaffected people.

Box 3.2: High blood pressure

Blood pressure represents the forces exerted by blood on the wall of the arteries and is written as systolic/diastolic (for example 120/80 mmHg, stated as '120 over 80'). Systolic blood pressure reflects the maximum pressure in the arteries when the heart muscle contracts to pump blood. Diastolic blood pressure reflects the minimum pressure in the arteries, when the heart muscle relaxes.

There is a continuous relationship between blood pressure levels and cardiovascular disease risk. This makes the definition of high blood pressure somewhat arbitrary. The WHO defines high blood pressure as:

- *systolic blood pressure of 140 mmHg or more; or*
- *diastolic blood pressure of 90 mmHg or more; or*
- *receiving medication for high blood pressure.*

In this report high blood pressure is defined using these guidelines.

Source: WHO-ISH 1999.

Major causes of high blood pressure include diet (particularly a high salt intake), obesity, excessive alcohol consumption and insufficient physical activity. Whether sustained psychological stress has a direct effect on blood pressure levels is subject to further research, but stress is likely to have indirect effects by influencing harmful health behaviours associated with high blood pressure (WHO 2002).

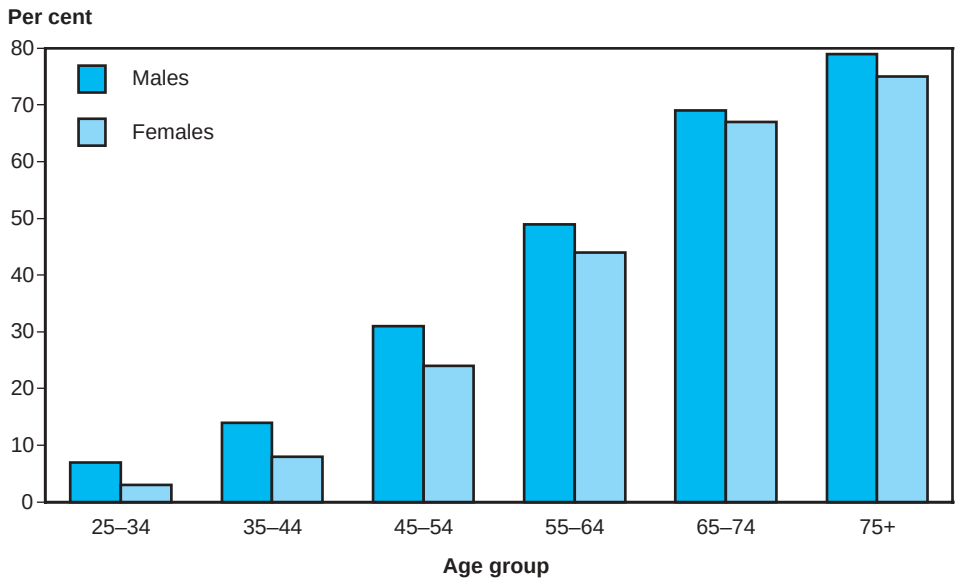
Despite the definition of high blood pressure in Box 3.2, there is in fact no threshold level of risk. Starting from quite low levels, as blood pressure increases so does the risk of stroke, heart attack and heart failure. Both systolic blood pressure and diastolic blood pressure are predictors of cardiovascular disease.

The burden of disease in Australia that can be attributed to high blood pressure was estimated to be more than 5% of the total among Australians in 1996 (AIHW: Mathers et al. 1999). As this figure was based on a threshold of 160/95 mmHg for high blood

pressure, it underestimates the burden corresponding to the cut-offs outlined in Box 3.2. Hypertension was the problem most commonly managed by general practitioners (GPs) in 2002–03, accounting for 6.1% of all problems managed (AIHW: Britt et al. 2003).

Prevalence and trends

Data from the 1999–2000 AusDiab indicate that 30% or 3.7 million Australians over the age of 25 years had high systolic or diastolic blood pressure or were on medication for that condition—32% of men and 27% of women. The proportion of men and women with high blood pressure increased with age (Figure 3.5).



Note: Based on WHO definition of high blood pressure (Box 3.2).

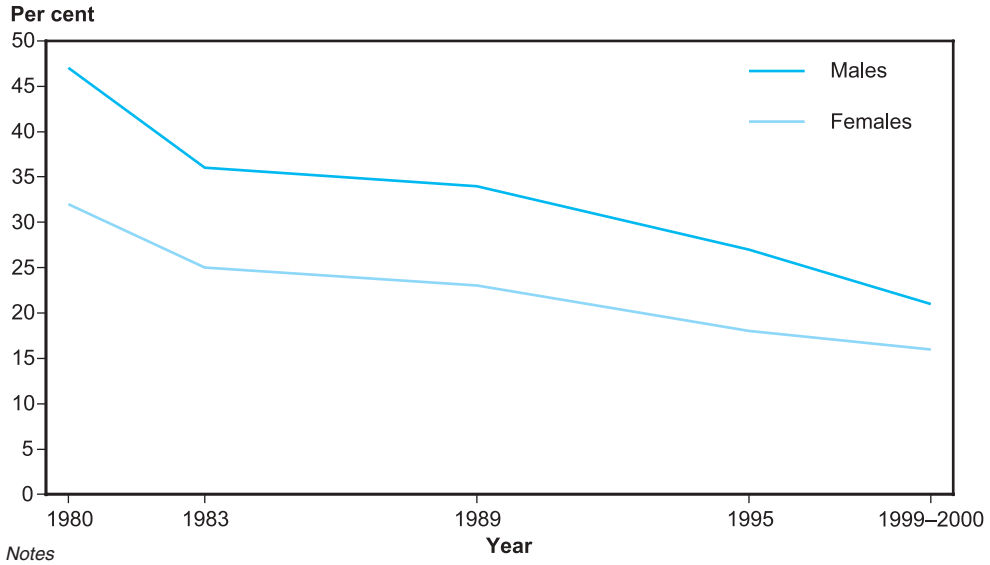
Source: AIHW analysis of the 1999–2000 Australian Diabetes, Obesity and Lifestyle Study.

Figure 3.5: Proportion of people with high blood pressure, 1999–2000

Since 1980 the prevalence of high blood pressure has decreased markedly for both males and females (Figure 3.6) (trends are available only for the urban population). The proportion of men aged 25–64 years with high blood pressure has more than halved from 47% in 1980 to 21% in 1999–2000 and has halved for women from 32% in 1980 to 16% in 1999–2000. Average blood pressure has also decreased over this period (Table S.65).

Aboriginal and Torres Strait Islander people

There are no national data on measured blood pressure to assess the prevalence of hypertension among Aboriginal and Torres Strait Islander people. However, the 2001 NHS collected data on self-reported high blood pressure. These showed that Indigenous Australians reported high blood pressure from a younger age than non-Indigenous Australians. Among Australians of all ages, 14% of Aboriginal and Torres Strait Islander people reported high blood pressure, compared with 10% of other Australians (ABS 2002c).



Notes

1. Age-standardised to the 2001 Australian population.
2. Based on WHO definition of high blood pressure (Box 3.2).
3. Urban areas only.
4. People aged 25–64 years.

Source: AIHW analysis of the 1980, 1983, 1989 Risk Factor Prevalence surveys, the 1995 National Nutrition Survey and the 1999–2000 Australian Diabetes, Obesity and Lifestyle Study.

Figure 3.6: Proportion of adults with high blood pressure, 1980 to 1999–2000

Blood cholesterol

High blood cholesterol is a major risk factor for coronary heart disease and ischaemic stroke. It is one of the main causes of atherosclerosis, the process by which the blood vessels that supply the heart and other parts of the body become clogged (see Box 3.3).

For most people, saturated fat in the diet is regarded as the main factor that raises blood cholesterol levels. Cholesterol in foods can also raise blood cholesterol levels, but usually less than saturated fat does (NHFA 1999). Genetic factors can also affect blood cholesterol significantly.

High blood cholesterol was estimated to have caused nearly 3% of the total burden of disease of Australians in 1996 (AIHW: Mathers et al. 1999). Lipid disorders, which include high blood cholesterol and high triglyceride levels, represented 2% of all problems managed by GPs in 2002–03 (AIHW: Britt et al. 2003). From 1998–99 to 2002–03 there was a significant increase in the management of lipid disorders by GPs, equivalent to 110,000 additional GP contacts on average per year nationally. This reflects a rise in workload (through ongoing management) rather than an increase in new cases presenting to general practice.

The 1999–2000 AusDiab estimated that around 50% of men and women in Australia had blood cholesterol levels of 5.5 mmol/L or more; that is, nearly six and a half million Australian adults aged 25 years and over. The prevalence increased with age to 65–74 years in women and 55–64 in men (Figure 3.7).

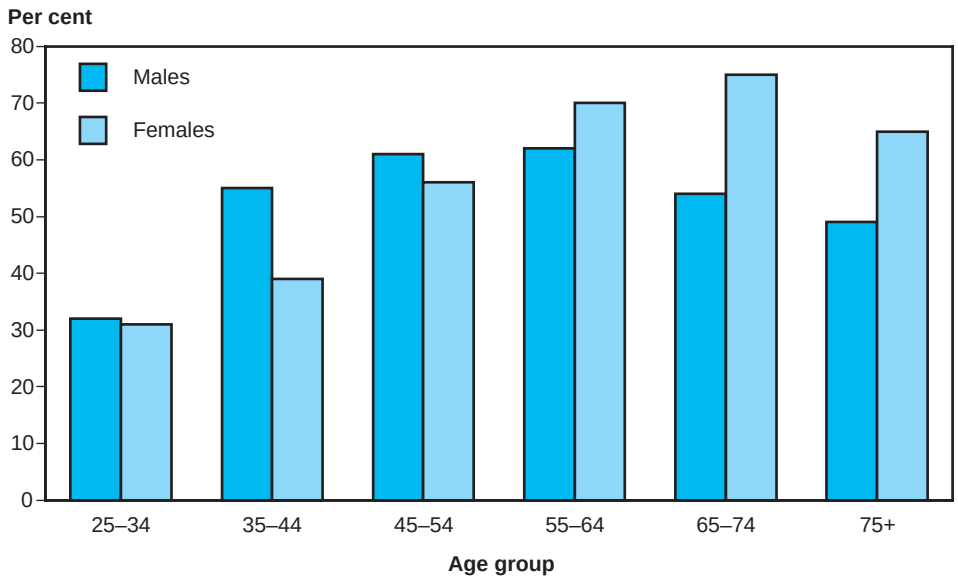
Box 3.3: High blood cholesterol

Cholesterol is a fatty substance produced by the liver and carried by the blood to the rest of the body. Its natural function is to provide material for cell walls and for steroid hormones. If levels in the blood are too high, this can lead to the artery-clogging process known as atherosclerosis that can bring on heart attacks, angina or stroke. The risk of heart disease increases steadily from a low base with increasing blood cholesterol levels. A total cholesterol level of 5.5 mmol/L or more is considered 'high' but this is an arbitrary cut-off.

Total cholesterol has several parts:

- *Low-density lipoprotein (LDL) cholesterol, often known as 'bad' cholesterol. Excess levels of LDL cholesterol are the main way that cholesterol contributes to atherosclerosis.*
- *High-density lipoprotein (HDL) cholesterol, often known as 'good' cholesterol. High levels have a protective effect against heart disease by helping reduce atherosclerosis.*
- *Triglyceride (TG) is another form of fat that is made by the body and its levels can fluctuate according to dietary fat intake. Under some conditions excess levels may contribute to atherosclerosis.*

In this report, high blood cholesterol is defined as a total cholesterol of 5.5 mmol/L or more.



Note: High blood cholesterol is 5.5 mmol/L or more.

Source: AIHW analysis of the 1999–2000 Australian Diabetes, Obesity and Lifestyle Study.

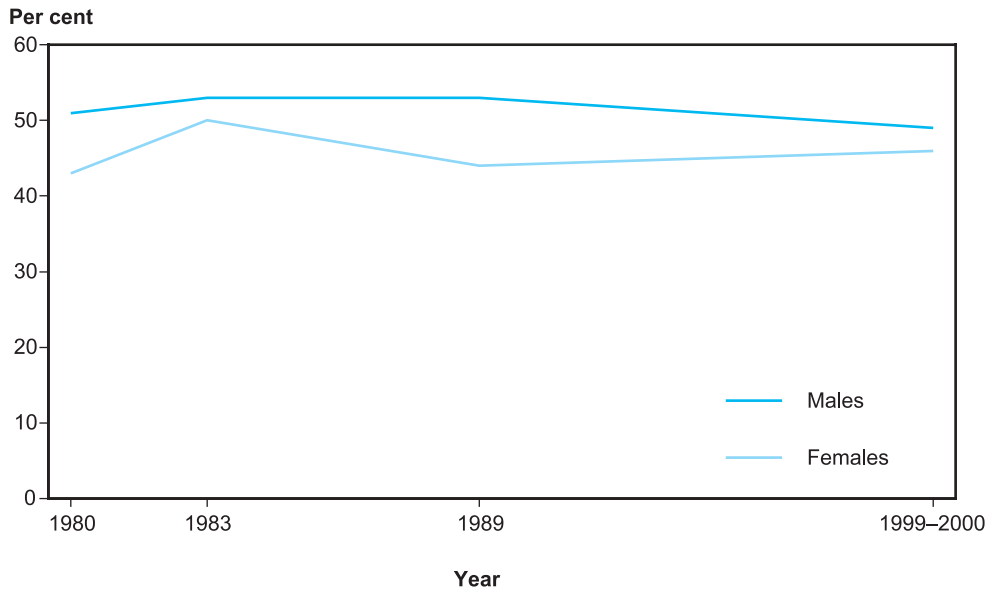
Figure 3.7: Proportion of adults with high blood cholesterol, 1999–2000

Trends in average blood cholesterol and high blood cholesterol prevalence are only available for people aged 25–64 years living in capital cities.

Average blood cholesterol levels in 1999–2000 were very similar to those 20 years earlier, for men and for women. Average cholesterol levels in Australia in 1999–2000 were 5.5 mmol/L for men and 5.4 mmol/L for women. Cholesterol levels in some societies are much lower than in Australia, as are their rates of cardiovascular disease, and this has been linked to their diet (Forge 1999).

Consistent with the trends in average levels, there has been no apparent reduction in the prevalence of people with high blood cholesterol since 1980 (Figure 3.8).

There are no national data on blood cholesterol levels among Aboriginal and Torres Strait Islander people.



Notes

1. Age-standardised to the 2001 Australian population.
2. Capital cities only.
3. People aged 25–64 years.
4. High blood cholesterol is 5.5 mmol/L or more.

Source: AIHW analysis of the 1980, 1983 and 1989 Risk Factor Prevalence surveys and the 1999–2000 Australian Diabetes, Obesity and Lifestyle Study.

Figure 3.8: Proportion of adults with high blood cholesterol, 1980 to 1999–2000

Glucose tolerance

Impaired glucose tolerance (IGT) is a metabolic stage between normal glucose tolerance and diabetes. As well as being a risk factor for Type 2 diabetes, IGT is linked to a greater risk of heart disease.

In people with IGT, blood glucose levels are higher than normal but less than the level required for a diagnosis of diabetes. Blood glucose levels normally rise after eating a meal then gradually fall as the meal is digested, but in people with IGT these levels remain elevated for longer after a meal. This is a result of reduced sensitivity of the body's cells to insulin with or without a reduction of insulin production by the pancreas (insulin is the hormone that enables the body to convert glucose to energy). Although many people with IGT may revert to normal glucose tolerance, one in three people with IGT is likely to develop Type 2 diabetes within 10 years (Harris & Zimmet 1992).

IGT is detected through the same test used to detect diabetes—the oral glucose tolerance test. People with IGT have a plasma glucose concentration of less than 7.0 millimoles/litre (mmol/L) after fasting, and 7.8 or more but less than 11.1 mmol/L two hours after the oral glucose load.

A new category, 'impaired fasting glucose' (IFG) is also considered to be predictive of diabetes and is based on an abnormal blood glucose measurement after fasting. The IFG category covers fasting plasma glucose levels of 6.1 mmol/L or more but less than 7.0 mmol/L (Colagiuri et al. 2002).

IGT is common in people who are physically inactive or obese, particularly with high fat deposits in the abdominal region, and is more common in older people where such risk factors are more widespread. With increasing age, the cells in the pancreas that make insulin—beta cells—become less efficient. This, combined with decreased physical activity and increased body weight, contributes to higher prevalence among older people (Table 3.3). For similar reasons, Type 2 diabetes is also more common among older people. Genetic factors are also important; people who have a family history of diabetes are more likely to suffer from IGT and to develop diabetes.

Table 3.3: Age-specific prevalence of impaired glucose tolerance (IGT) and impaired fasting glucose (IFG), people aged 25 years and over, 1999–2000

	Males		Females	
Age (years)	IGT	IFG	IGT	IFG
		(per cent)		
25–34	2.1	3.4	4.9	0.5
35–44	4.7	8.4	8.9	2.1
45–54	9.0	9.3	11.0	5.1
55–64	14.8	12.8	15.7	4.5
65–74	20.4	11.5	21.9	4.3
75+	24.8	4.6	22.1	8.4

Source: Dunstan et al. 2002.

Results from the 1999–2000 AusDiab indicated that 10.6% of Australians aged 25 years and over had IGT and an additional 5.8% had IFG (Dunstan et al. 2002). IGT was slightly more common in women (11.9%) than men (9.2%). In contrast, IFG was more common in men (8.1%) than in women (3.4%).

The prevalence of IGT has more than trebled since 1981, with age-adjusted rates increasing from 3.2% to 9.8% in men and 3.0% to 12.3% in women (Dunstan et al. 2001). Dunstan et al. (2002) found that the increasing prevalence of obesity in Australia since 1981 was a significant contributing factor to the increasing prevalence of diabetes since that time. Given the links between obesity and IGT, this trend may also contribute to the escalating prevalence of IGT.

3.2 Genetic factors

Genetic factors play an important role in disease susceptibility and resistance. An individual's genetic makeup (the genome) provides the background against which the environment interacts with the human body.

Just as each individual is unique in genetic constitution, and hence in their susceptibility or resistance to disease, the genetic basis of a population's health can also be quite distinctive. Some of these genetic differences between populations are reflected in varying disease patterns and outcomes. The low incidence in Aboriginal and Torres Strait Islander Australians of rheumatoid arthritis and Type 1 diabetes—two diseases with well-known genetic susceptibilities and common in non-Indigenous populations—are good examples of this variation.

The contribution of genetic factors to health varies with age and environmental exposure. A study in Canada suggested that, before age 25, more than 5% of all live-born individuals would be affected with a disease that is mainly genetic in origin (Baird et al. 1988). However, it is often difficult to clearly identify genetic and environmental factors involved in diseases.

In addition to genetic variation that is inherited via reproductive cells (eggs and sperm), significant changes occur in the genetic material of non-reproductive cells over the life of an individual. Damage to these non-reproductive cells may also be subject to genetic control, but is limited only to the individual in which it occurs. Various cancers are examples of these genetic changes which are not passed on to children.

Genetic diseases and disorders

The genetic contribution to disease can vary considerably between individuals. In some cases the disease will occur regardless of the environment. In others it may be expressed partially, depending on how the genetic defect and the environment interact. Broadly, there are three major types of genetic diseases or disorders: monogenic and polygenic diseases, and chromosomal anomalies.

Monogenic diseases

Monogenic diseases result from an alteration or a change in the structure of a single (mono) gene. About 2% of the population will have a monogenic problem or condition,

with some of the problems showing up at birth and others later in life. Common examples are cystic fibrosis, muscular dystrophy and haemophilia.

Cystic fibrosis is one of the most serious monogenic diseases in Australia today. One in twenty-five people carry a copy of its gene, first identified in 1989, but only those people with two copies have any symptoms. In 2000, 45 Australian deaths were attributed to cystic fibrosis.

Limited information is available on the prevalence of monogenic diseases. It is now possible to detect several of these disorders early in life or even before birth.

Polygenic diseases

Quite often, more than one gene may contribute to the development of a disease (polygenic) together with environmental factors. The genetic contribution to these multifactorial diseases varies considerably. Common examples are cancers and several chronic diseases. Genetic factors may also affect susceptibility to various infections.

Cancers are typically due to damage to genes from exposure before or after birth to certain environmental agents (for example, tobacco smoke). A minority of cancers result from inheritance of a damaged gene.

Chronic diseases such as asthma, diabetes and Alzheimer's disease are the largest source of genetic burden of disease, mainly because of their high prevalence in the population. A variety of genes make a subtle contribution to a person's susceptibility to these chronic diseases. For example, genes located on chromosomes 5, 6, 11, 12 and 14 have been implicated in asthma (Khoury 1996). Similarly, about ten genes that increase the risk of Type 1 diabetes have now been described in the human genome.

Chromosomal anomalies

Chromosomal anomalies are a large source of chronic disease, disability and premature mortality. These anomalies arise through changes in the physical structure of the chromosomes or changes in the number of chromosomes. Common examples are Down syndrome, Klinefelter's syndrome and Turner's syndrome.

Chromosomal anomalies are among the best-defined causes of foetal loss or congenital disease. The incidence of chromosomal anomalies among live-born infants is estimated at about 0.5%. These anomalies also account for almost 50% of all spontaneous abortions. Tests are available to detect many chromosomal anomalies before birth (Khoury 1996).

Down syndrome, with three copies of chromosome 21 (trisomy 21) instead of the normal two, leads to much morbidity and premature mortality. Approximately 75% of cases with trisomy 21 die in the embryonic or foetal stage. Approximately 85% of affected infants survive to 1 year and 50% can be expected to live longer than 50 years. The presence of congenital heart disease is the most significant factor that determines survival. Individuals with Down syndrome have a greatly increased morbidity, primarily due to infections involving impaired immune response.

3.3 Health behaviours

Dietary behaviour

Diet plays a major role in health and disease. In recent decades much evidence has shown that dietary patterns can either reduce or increase the risk of various diseases and their risk factors. There are many areas of interest in dietary behaviour, but the greatest issue in Australia today is overconsumption.

Dietary guidelines from the National Health and Medical Research Council (NHMRC) (2003a, 2003b) recommend consuming a wide variety of nutritious foods including a high intake of plant foods (such as cereals, fruit, vegetables, legumes and nuts). They also recommend moderating total fat intake and limiting saturated fat intake to reduce the risk of coronary heart disease, Type 2 diabetes, several of the common cancers, and overweight and obesity. Other common diseases and risk factors where good nutrition may reduce risk include stroke, osteoporosis, tooth decay and high blood pressure (Table 3.4).

Table 3.4: Components of food which may help protect against diseases and conditions of public health importance

Dietary factor	Diseases (or conditions) against which protection may be provided or for which risk may be reduced
High intake of plant foods, low fat and saturated fat intake, high dietary fibre intake	Coronary heart disease, angina, colon, bowel, breast and prostate cancers, overweight and obesity
High intake of plant foods, low salt intake	High blood pressure, stroke
High intake of plant foods	Type 2 diabetes, constipation, gastrointestinal cancers (including cancers of the colon, rectum, stomach, pancreas and oesophagus), lung cancer and cancers of the breast, prostate, cervix and bladder
Low fat and saturated fat intake	Colorectal cancer
Low alcohol intake	Most cancers, liver cirrhosis, brain damage and foetal alcohol syndrome
Adequate to high calcium intake	Osteoporosis
Infrequent and low sugar intake	Tooth decay

Source: Adapted from Smith et al. 1998.

There have been so few data collected in recent years on the food and nutrient intake of Australians that much of the following discussion relates to data that are five to ten years old.

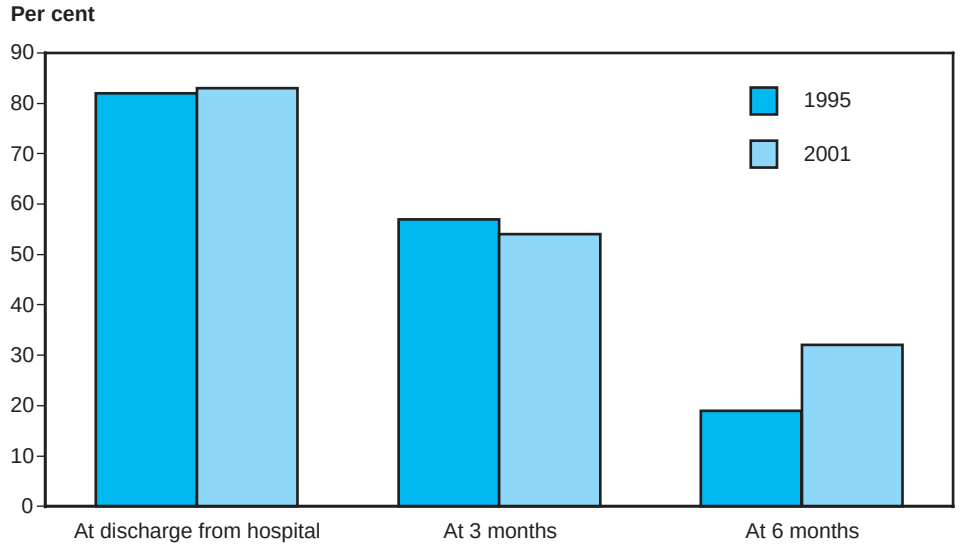
Folate intake

The impact of good nutrition on health begins early in life. It has been known for many years that insufficient folate or folic acid (a B vitamin) in the diet of women of child-bearing age increases the risk of having a foetus affected with spina bifida or other neural tube defects. The NHMRC (1994) recommends that women capable of becoming pregnant consume 400 µg per day of folate. Based on analysis of data from the 1995 National Nutrition Survey, only 1% of women aged 15–49 years consumed the recommended amount in their diet (excluding supplements) (Abraham & Webb

2001). To increase folate intakes, particularly among women of child-bearing age, voluntary folate fortification (at the discretion of food manufacturers) of selected staple foods was introduced in 1995. However, by late 1998, it was estimated that voluntary fortification had had little effect on folate intakes among the target population, due largely to the small number of foods that were fortified (Abraham & Webb 2001). More recent information from the 2001 NHS shows that few women aged 18–49 years (11.4%) are deliberately increasing their intake of folate either through the use of supplements containing folate or through consuming foods fortified with folate.

Breastfeeding

Breastfeeding is an important contributor to infant health and may influence health status in adults. Evidence is accumulating that breastfeeding may have a protective role in several chronic diseases including Type 1 diabetes, inflammatory bowel disease, allergic diseases and obesity (NHMRC 2003b). It is recommended that babies be exclusively breastfed for six months, with the introduction of complementary foods and continued breastfeeding thereafter (NHMRC 2003b). In 1995, Australian breastfeeding rates were quite high at discharge from hospital (82%), 57% of babies were exclusively breastfed at 3 months (includes water and water-based drinks such as fruit juice) but just 19% were exclusively breastfed at 6 months (Donath & Amir 2000). More recent data from the 2001 NHS showed an initiation rate of 83%, with 54% exclusively breastfed at 3 months and 32% exclusively breastfed at 6 months (Figure 3.9) (ABS 2003c).



Source: ABS 2003c.

Figure 3.9: Proportion of babies exclusively breastfed, 1995 and 2001

The prevention of weight gain can begin early in life. The American Academy of Pediatrics recently acknowledged the role of breastfeeding in the prevention of overweight and obesity in children (Krebs et al. 2003). The authors cite several studies which identify both the extent and duration of breastfeeding and their role in protecting against the risk of obesity in later childhood. The association is attributed to physiological factors in human milk as well as feeding and parenting patterns associated with nursing.

Undernutrition and food security

Nutritional deficiencies are rare among Australian children and adults, although they can be of concern for some population groups: the aged, people with a chronic disability, some Aboriginal and Torres Strait Islander communities, the poor, the homeless, and those who suffer from substance abuse, alcoholism and some chronic diseases. Undernutrition (defined as a deficiency of energy or nutrients) in young children may contribute to an increased risk of abdominal obesity, Type 2 diabetes, hypertension, cardiovascular disease and renal disease in adult life—and the association is strongest when undernutrition occurs before birth (SIGNAL 2001).

The availability of healthy, affordable foods and the capacity of individuals and communities to access them can affect nutritional status. In the 2001 NHS, 4.7% of the male respondents and 5.6% of the females aged 19 years and over indicated that there had been times in the last two months when they had run out of food and could not afford to buy more. These results were similar to those obtained in the 1995 National Nutrition Survey (4.5% and 5.8%, respectively). In the 2001 survey, those without post-school qualifications were more likely to report having run out of food (6.5%) than those with a diploma or higher qualification (3.0%). People living in rural and remote areas of Australia are also vulnerable as they typically pay more for healthy foods, and perishable items such as dairy foods, fruit and vegetables are frequently in short supply and of poorer quality (NHMRC 2003a). Many Aboriginal and Torres Strait Islander people live in these areas and poor nutrition contributes to their poor health (NHMRC 2000).

Overconsumption of food

Despite continuing concerns about undernutrition in some sections of the Australian population, the most important dietary issue to emerge in recent years is the overconsumption of food. Overconsumption, or the consumption of more calories than are required to meet energy needs, is contributing to Australia's increase in obesity which in turn is a significant contributing factor in the development of many diseases (see section on body weight earlier in this chapter).

Overconsumption of food among children and adolescents is also contributing to the rise in overweight and obesity in these age groups. A comparison of food and nutrient intake among Australian children aged 10–15 years showed that average intake of energy increased significantly, by nearly 15% for boys and nearly 12% for girls, between 1985 and 1995 (Table 3.5). The increases were mainly attributable to an increased intake of carbohydrate from a range of foods including cereals and cereal-based foods, confectionery, non-alcoholic beverages and sugar products. Among

males and females aged 25–64 years living in state capital cities there were also significant increases in energy intake (but to a lesser extent than in children) between 1983 and 1995.

Table 3.5: Average daily intake of energy (kJ) among children and adults, 1983, 1985 and 1995

	1983	1985	1995	Percentage increase[(a)]
Boys 10–15 years	n.a.	9,670	11,088	14.7
Girls 10–15 years	n.a.	7,586	8,488	11.9
Males 25–64 years	10,824	n.a.	11,195	3.4
Females 25–64 years	7,299	n.a.	7,624	4.5

(a) Differences between estimated averages for 1985 and 1995 (children) and 1983 and 1995 (adults) are statistically significant at the 0.01 level.

Notes

1. Analysis of data for children: adjustments for changes in the food composition database were made to enable estimates of 'real change' in food and nutrient intakes to be better assessed. However, differences in the dietary methods between surveys could not be adjusted for due to small sample sizes. Adjustments could not be made for sample design differences (such as season and day of week) or demographic changes between the 1985 and 1995 surveys.
2. Analysis of data for adults: adjustments for changes in survey design (relating to age, geographical coverage, season and day of week), changes in the food composition database and changes in the Australian population profile between 1983 and 1985 were made to enable estimates of 'real change' in food and nutrient intakes to be assessed.
3. Adult data are for state capital cities only.

Source: Cook et al. 2001.

Fruit and vegetable intake

Despite concerns about overconsumption of food in Australia and its contribution to the rising prevalence of overweight, large sections of the population are not consuming adequate amounts of fruit and vegetables. The NHMRC dietary guidelines recommend that adults consume at least two serves of fruit and five serves of vegetables per day (NHMRC 2003a). Analysis of self-reported data from the 2001 NHS showed that just 30% of people aged 12 years or more usually ate four or more serves of vegetables per day and 53% usually ate two or more serves of fruit (ABS 2002b). It is estimated that, in 1996, inadequate fruit and vegetable consumption (defined in the study as less than five serves per day) was responsible for 3% of the total burden of disease and 11% of the total cancer burden in Australia (AIHW: Mathers et al. 1999).

Saturated fat intake

A diet high in saturated fat increases the risk of coronary heart disease through its effect on raising both total and LDL cholesterol. In 1995, among Australian adults, saturated fat accounted for around 13% of total energy intake, higher than the recommended maximum level of 10% (AIHW 2004a). The major sources of saturated fats in the adult diet are milk, cream, cheese, butter, pastries and fatty meats.

National nutrition strategies

The evidence linking diet with preventable disease is recognised in Australia and internationally. Australia's response has included the establishment of the Strategic Inter-Governmental Nutrition Alliance (SIGNAL) in 1997 which was responsible for the

development of the National Public Health Nutrition Strategy 2000–2010 (referred to as Eat Well Australia). A complementary strategy for Indigenous Australians (the National Aboriginal and Torres Strait Islander Nutrition Strategy and Action Plan) was also developed by the National Aboriginal and Torres Strait Islander Nutrition Working Party.

Eat Well Australia focuses on areas where nutrition can bring the greatest health gain. These include promoting fruit and vegetable consumption, promoting healthy weight, promoting good nutrition for mothers and babies, promoting good nutrition for school-aged children, improving nutrition for vulnerable groups, and addressing structural barriers to safe and healthy food (SIGNAL 2001). The Indigenous strategy focuses on nutrition issues and diet-related diseases affecting Aboriginal and Torres Strait Islander peoples. These include food access, promotion of breastfeeding, nutrition for mothers and babies, infections and childhood growth, renal disease and dental health (NATSINWP 2001).

Physical activity

Physical activity is an important factor in maintaining good health. However, a significant and possibly growing majority of Australians are not physically active enough to obtain health benefits. 'Sufficient' activity for health benefit reflects both the time and number of sessions spent on physical activity (see Box 3.4). People who do lower-than-recommended levels of physical activity have an increased risk of mortality and morbidity from a range of diseases and conditions. Low levels of physical activity have been ranked second only to tobacco smoking, in terms of the burden of disease and injury from risk factors in Australia (AIHW: Mathers et al. 1999).

Box 3.4: What is sufficient physical activity for health?

The National Physical Activity Guidelines for Australians recommend 'at least 30 minutes of moderate-intensity physical activity on most, preferably all, days of the week' to obtain health benefits. This is generally interpreted as 30 minutes on at least five days of the week, a total of at least 150 minutes of moderate activity per week. Examples of moderate-intensity activity are brisk walking, swimming, doubles tennis and medium-paced cycling. More vigorous physical activity such as jogging and aerobics provides further health benefits.

There are two ways of calculating 'sufficient' activity for health based on the Australian Guidelines. These are: 'sufficient time' (at least 150 minutes per week of moderate-intensity physical activity) and 'sufficient time and sessions' (at least 150 minutes of moderate-intensity physical activity accrued over at least five sessions per week). For population-monitoring purposes, sufficient time and sessions is the preferred measure of sufficient activity for health as it takes into account the frequency as well as duration of physical activity. Research suggests that even shorter sessions (down to 10 minutes) can be beneficial as well, provided they add up to the required total over the week.

Sources: DHAC 1999; AIHW 2003b.

The strongest evidence for the benefits of regular physical activity concerns its ability to reduce the risk of cardiovascular disease, particularly coronary heart disease. People who do not take part in regular moderate-intensity physical activity are nearly twice as likely to have a heart attack as those who do (Blair et al. 1996). Maintaining regular physical activity improves levels of other cardiovascular risk factors such as overweight, high blood pressure, low levels of HDL (the 'good' cholesterol) and Type 2 diabetes, and can help protect against some forms of cancer. It also strengthens the musculoskeletal system, helping to reduce the likelihood of osteoporosis (low bone-mineral density) and the risk of falls and fractures. Taking part in physical activity also improves mental wellbeing (in both the short term and longer term) by reducing feelings of stress, anxiety and depression.

Despite the recognised health benefits, physical activity levels are low in industrialised countries. Labour-saving devices and passive forms of entertainment (such as computers, television, video games and the Internet) have increased the time spent in sedentary or minimally active states. At the same time, increased car ownership, increases in traffic and safety concerns have led to less walking, cycling and transport-related physical activity. Research also indicates that people perceive they have less discretionary time available for exercise or sporting activities (Bauman et al. 2002).

Prevalence and trends

Various methods are available to measure physical activity, so results from different surveys can provide different estimates of the proportion of people who are sufficiently or insufficiently active for health. Most of the information presented here is based on data obtained from the 1997, 1999 and 2000 National Physical Activity surveys. This series examined self-reported participation in walking (including walking for transport), other moderate activity and vigorous activity during leisure time, using the Active Australia Survey instrument (Box 3.5). Non-leisure time physical activity such as work or domestic activity also contributes to overall physical activity. However, this component of physical activity is difficult to measure accurately, and the instruments used to measure it are not generally practical for use in population surveys. Work is currently under way internationally to develop simpler instruments.

Box 3.5: The Active Australia Survey

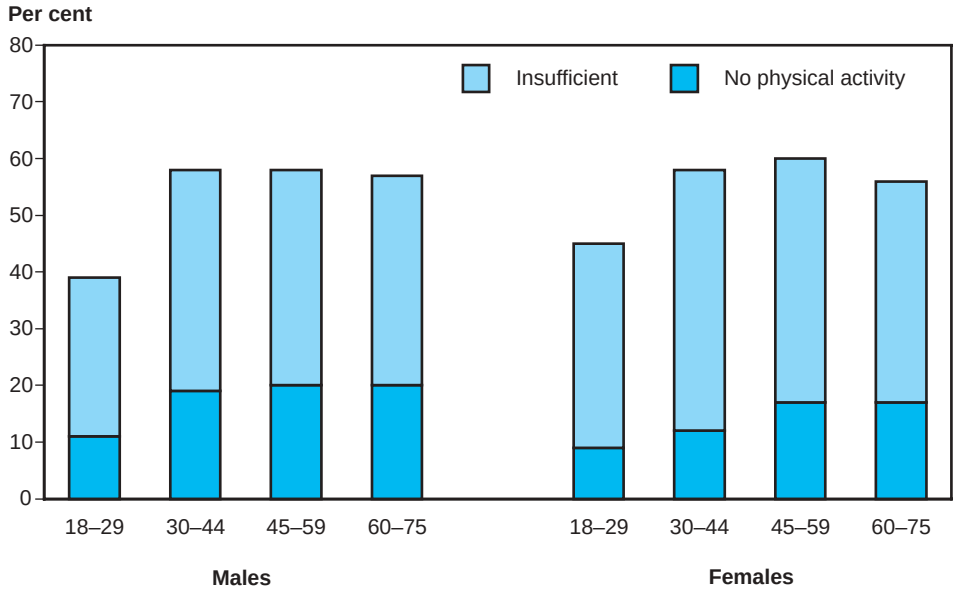
The Active Australia Survey is designed to use self-reporting to measure participation in leisure-time physical activity (including walking, vigorous gardening or yard work, and other vigorous or moderate physical activity) and to assess knowledge of public health messages about the health benefits of physical activity. It offers a short and reliable set of questions that can be easily implemented via computer-assisted telephone interviewing techniques or in face-to-face interviews. This survey has been run nationally through the National Physical Activity surveys in 1997, 1999 and 2000, and AusDiab in 1999–2000.

Sources: AIHW 2003a; AIHW 2003b.

Here, 'sufficient time and sessions' is used as the measure of 'sufficient' physical activity for health. 'Sufficient time and sessions' is defined as at least 150 minutes (two-and-a-half hours) of at least moderate-intensity physical activity accrued over at least five separate sessions (10 minutes or more) in the previous week. 'Insufficient physical activity' is the completion of some physical activity but either not enough in total or not regularly enough to meet the 'sufficient time and sessions' criteria.

Data from the 2000 National Physical Activity Survey showed that more than half (54%) of Australians aged 18–75 years did not undertake leisure-time physical activity at the levels recommended to achieve health benefits. Around 15% of people reported 'no physical activity' during the previous week, and around 39% reported some activity but for either insufficient time or for too few sessions. More men (18%) than women (13%) reported 'no physical activity'.

Rates of 'insufficient' physical activity were highest among 30–59-year-olds and lowest among 18–29-year-olds, for both men and women (Figure 3.10). The proportion of people reporting 'no physical activity' increased with age, from 11% of men and 9% of women aged 18–29 years to 20% of men and 17% of women aged 45 years and over.



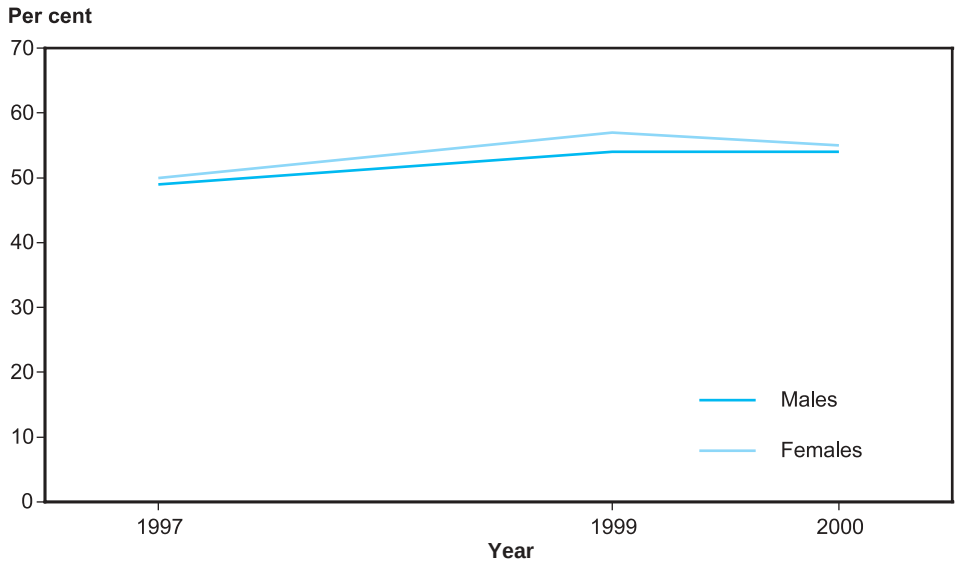
Notes

1. Age-standardised to the 2001 Australian population.
2. People aged 18–75 years.
3. 'Insufficient physical activity' is less than 150 minutes or less than five sessions of physical activity in the previous week.

Source: AIHW analysis of the 2000 National Physical Activity Survey.

Figure 3.10: Proportion of adults undertaking insufficient or no physical activity, 2000

Available data suggest little change in physical activity patterns during the 1980s and much of the 1990s in Australia. However, between 1997 and 2000 the proportion of Australians reporting lower-than-recommended levels of physical activity rose (from 49% to 54%) (Figure 3.11). During this period, the prevalence of 'insufficient' levels of physical activity increased among men and women, and across all age groups with the exception of those aged 60–75 years (for whom activity levels remained fairly constant). The proportion of people reporting 'no physical activity' also rose slightly between 1997 and 2000 (from 14% to 16%). This rise was due to an increase in the proportion of men reporting 'no physical activity' (from 14% in 1997 to 18% in 2000). The proportion of women reporting 'no physical activity' did not change during this period.



Notes

1. Age-standardised to the 2001 Australian population.
2. People aged 18–75 years.
3. 'Insufficient physical activity' is less than 150 minutes or less than five sessions of physical activity in the previous week.

Source: AIHW analysis of the 1997, 1999, 2000 National Physical Activity surveys.

Figure 3.11: Proportion of adults undertaking insufficient or no physical activity, 1997, 1999 and 2000

Children and adolescents

There are no national trend data on the physical activity patterns of Australian children and adolescents. However, many activities now widely undertaken by young people involve very little physical activity. In the 2000 Australian Bureau of Statistics' Children's Participation in Cultural and Leisure Activities Survey, the most popular leisure activity outside school hours during the previous two weeks was watching

television and videos (undertaken by 97% of boys and girls aged 5–14 years) (ABS 2001). Playing electronic or computer games was also a popular leisure-time activity (69% of boys and girls combined). Decreasing levels of physical activity are believed to have contributed to the doubling in the prevalence of overweight and obesity among Australian children and adolescents over the past two decades (Magarey et al. 2001).

Health inequalities

Socioeconomic groups

Participation in physical activity varies across socioecocomic groups, with people from the lowest socioeconomic backgrounds more likely to have lower-than-recommended levels. In 2000, 61% of people with less than 12 years of education did not undertake physical activity at the recommended levels, compared with 52% of people who completed secondary school and 51% of those with a TAFE or tertiary qualification. Around one in five adults with less than 12 years of education reported 'no physical activity', nearly twice the rate for the TAFE or tertiary-educated group. However, the survey questions omit work-related physical activity, which could affect this finding.

Aboriginal and Torres Strait Islander people

Aboriginal and Torres Strait Islander people are more likely than other Australian adults to report no physical activity in their leisure time. In the 2001 NHS, around 43% of Indigenous Australian adults living in non-remote areas reported 'no leisure-time physical activity', compared with about 30% of other Australians living in the same areas (ABS 2002c).

Overseas-born Australians

In 2000, people who usually spoke a language other than English at home (64%) were more likely than people who spoke English at home (54%) to report lower-than-recommended levels of physical activity (AIHW: Holdenson et al. 2003).

Tobacco smoking

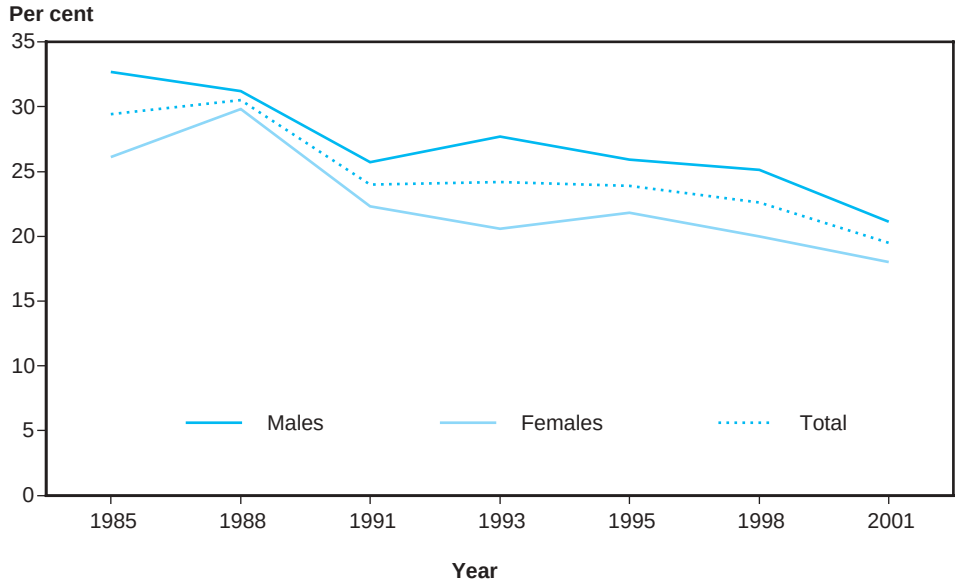
Impact and prevalence

Tobacco smoking contributes to more deaths and drug-related hospitalisations than alcohol and illicit drug use combined. It is a major risk factor for coronary heart disease, stroke, peripheral vascular disease, cancer, and a variety of other diseases and conditions.

Of all the health risk factors, smoking is responsible for the greatest disease burden in Australia: around 12% of the total burden of disease in males and 7% in females (AIHW: Mathers et al. 1999). Globally, the WHO estimates that tobacco causes 8.8% of deaths and 4.1% of the total burden of disease (WHO 2002).

Estimates from the 2001 National Drug Strategy Household Survey (NDSHS) indicate that around 3.1 million Australians (19.5% of people aged 14 years and over) smoked tobacco daily. Males were more likely to be daily smokers (21.1%) than females (18.0%). Further, 26% of the population were former smokers (30% of males and 23% of females) and 51% had never smoked (45% of males and 56% of females). Data from the 2001 NHS showed similar results for adults.

In Australia, smoking rates have been declining since the 1950s, when it was estimated that around 70% of men and 30% of women smoked (Department of Community Services and Health 1990). Over the past 15 years, both male and female smoking prevalences have continued to decline, with rates around 20% in 2001 (Figure 3.12).



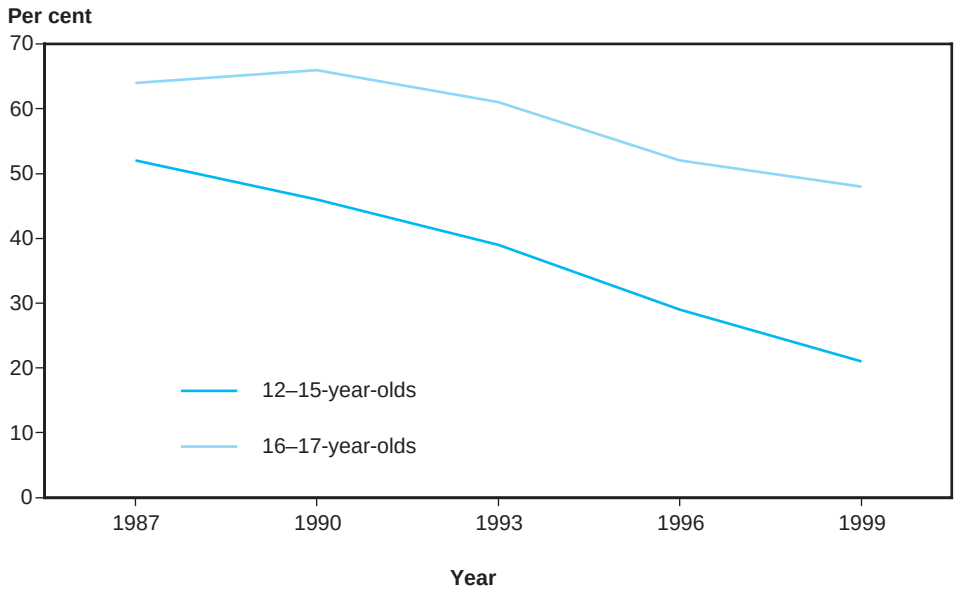
Sources: National Campaign Against Drug Abuse Social Issues surveys 1985, 1988; National Campaign Against Drug Abuse Household surveys 1991, 1993; National Drug Strategy Household surveys 1995, 1998, 2001.

Figure 3.12: Daily smokers: proportion of people aged 14 years and over, 1985 to 2001

Smoking among young people

All states and territories in Australia have enacted legislation prohibiting the sale of cigarettes to people under the age of 18 years. However, in 2001 around 12% of young Australians aged 14–17 years were daily smokers, with a further 4% smoking occasionally (AIHW 2002b). Teenage girls were more likely to be daily smokers (13%) than teenage boys (10%). The NDSHS results corroborate findings of the Australian Secondary Schools Alcohol and Drug Surveys (ASSADS): around the turn of the century smoking trends among teenagers were declining or at least stable (Hill et al. 2002).

The ability of teenagers to purchase cigarettes increases the likelihood of smoking and there is evidence that purchasing such products may be decreasing. Estimates from the ASSADS show that the proportion of 12–15-year-old current smokers who purchased their most recent cigarette declined from 52% in 1987 to 21% in 1999, while for 16–17-year-olds the corresponding decline was from 64% to 48% (Figure 3.13).



Source: Hill et al. 2002.

Figure 3.13: Teenage smokers: proportion who purchased their most recent cigarette, 1987 to 1999

Children exposed to tobacco smoke in the home

Passive smoking has been shown to contribute to a variety of health problems in adults and children, with children being particularly susceptible. Passive smoking is considered a factor in respiratory infections, middle ear infections, the onset and worsening of asthma, decreased lung function, eye and nose irritation, low birthweight and sudden infant death syndrome (NHMRC 1997; NDS 2002).

The benefits of reducing children's exposure to environmental tobacco smoke at home also include reduced school absenteeism, increased school performance, reduced uptake of smoking, and decreased consumption of tobacco among children who smoke (NDS 2002).

Over the period 1995–2001, around one-third of all Australian households included dependent children (that is, children aged 14 years and under). In 1995, around 31% of these households had someone who smoked inside the home (Table 3.6). With the general decline in smoking prevalence and increasing awareness of the harmful effects of passive smoking, this figure has fallen in 2001 to less than 20% of households, or just over 800,000 dependent children exposed to tobacco smoke inside the home. A similar decline is observed in households with no dependent children aged 14 years or under.

Table 3.6: Household smoking status[(a)] by dependent children status[(b)], 1995 to 2001

Household smoking status	Dependent children 1995	Dependent children 1998	Dependent children 2001	No dependent children[(c)] 1995	No dependent children[(c)] 1998	No dependent children[(c)] 2001
	(per cent)					
Smokes inside the home	31.3	22.6	19.7	32.2	26.6	21.3
Only smokes outside the home	16.7	21.5	24.9	13.7	18.0	19.8
No-one at home regularly smokes	52.0	55.9	55.4	54.1	55.4	58.9

(a) Household smoking status as reported by respondent aged 14 years and over.

(b) Households contain dependent children aged 14 years or under.

(c) May include dependants aged 15 years and over.

Source: National Drug Strategy Household surveys 1995, 1998, 2001.

Smoking trends among older Australians

Adults of all ages are now less likely to smoke than their counterparts in the past. For younger age groups this is increasingly due to fewer people having started to smoke, whereas for older adults the reasons are more likely to be that they stopped smoking.

Analysis of the NDSHS from 1991 to 2001 shows that among people born in the period 1932–41 (aged 62–72 years in 2004), the proportion of daily smokers decreased from around 27% in 1991 to 11% in 2001 (Table 3.7). Declines were also observed for people born before 1932. Almost all of this decrease in the proportion of smokers is accounted for by the increase in the proportion of former smokers. However, some of the decrease in smoking rates as age increases is likely to be due to smokers having already died.

Table 3.7: Changes in smoking status among older Australians: persons aged 60 years or more in 2001, 1991 to 2001

Year of birth cohort	1991	1995	2001
		(per cent)	
		Daily smokers	
1932–41	26.5	20.9	11.4
1922–31	13.7	12.5	6.6
1921 or earlier	9.3	13.7	3.4
		All smokers	
1932–41	28.7	22.6	12.6
1922–31	16.5	14.2	7.0
1921 or earlier	10.8	13.7	3.8
		Former smokers[(a)]	
1932–41	20.8	23.5	37.5
1922–31	32.0	32.5	39.9
1921 or earlier	25.3	31.3	40.7
		Never smokers[(b)]	
1932–41	50.5	53.9	49.9
1922–31	51.5	53.3	53.0
1921 or earlier	63.9	55.0	55.5

(a) Have not smoked in the last 12 months.

(b) Have smoked 100 cigarettes or less in their life.

Sources: National Campaign Against Drug Abuse Household Survey 1991; National Drug Strategy Household surveys 1995, 2001.

Alcohol consumption

Excessive alcohol consumption is a major risk factor for morbidity and mortality. In Australia in 1998, 3,271 deaths were attributable to excessive consumption of alcohol (AIHW: Ridolfo & Stevenson 2001).

In contrast to the effects of excessive use, some longer term benefits are thought to arise from low to moderate alcohol consumption, largely through reduced risk of stroke and coronary heart disease. The net harm associated with alcohol consumption, after taking into account these benefits, is around 2.2% of the total burden of disease. The distribution of harm and benefit varies with age. For both males and females, the harmful burden of disease is highest in the 15–24-year age group, mainly due to road trauma and other injury. The largest protective effect is realised in persons over 65 years of age, because of the increased underlying risk of cardiovascular disease in this age group.

Prevalence

Analysis of the NDSHS from 1991 to 2001 shows that around four in five Australians aged 14 years and over drank alcohol, but only about one in ten did so daily (Table 3.8). These rates have been fairly stable since 1993.

Table 3.8: Alcohol drinking status: proportion of the population aged 14 years and over, 1991 to 2001

Drinking status	1991	1993	1995	1998	2001
			(per cent)		
Daily	10.2	8.5	8.8	8.5	8.3
Occasional[(a)]					
Weekly	41.0	39.9	35.2	40.1	39.5
Less than weekly	30.4	29.5	34.3	31.9	34.6
Total occasional[(a)]	*71.4*	*69.4*	*69.5*	*72.0*	*74.1*
All drinkers	81.6	77.9	78.3	80.5	82.4
Ex-drinker[(b)]	12.0	9.0	9.5	10.0	8.0
Never a full serve of alcohol	6.5	13.0	12.2	9.4	9.6

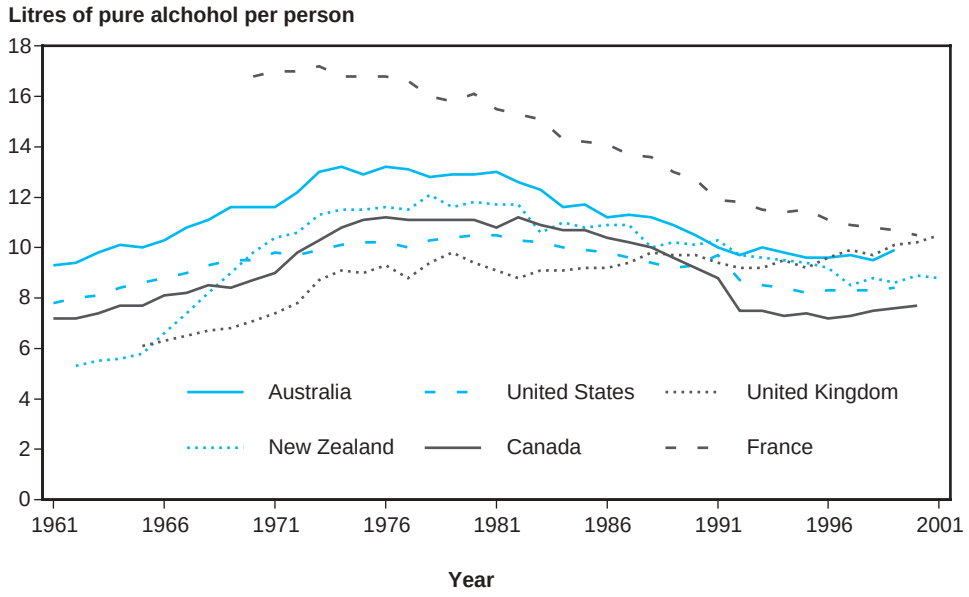
(a) Occasional drinkers are those that drink alcohol less than daily, that is, weekly or less than weekly.

(b) Ex-drinkers are those that have consumed at least a full serve of alcohol, but not in the last 12 months.

Sources: National Campaign Against Drug Abuse Household surveys 1991, 1993; National Drug Strategy Household surveys 1995, 1998, 2001.

International comparison

Alcohol consumption (litres of pure alcohol per person aged 15 years or more) for six selected OECD countries has varied considerably since 1961 (Figure 3.14). In general, Australia followed the trend of the other countries, with increasing consumption up to the mid-1970s followed by a decline over the next two decades. Throughout most of this period Australia had the second highest consumption among these countries, behind France. Since 1996, the continued gentle and slowing decline in consumption in Australia, the steeper decline in France, and the consistent growth in the United Kingdom, have seen alcohol consumption in the United Kingdom exceed that of the other five countries.



Source: OECD 2003.

Figure 3.14: Alcohol consumption, 15 years and over, selected countries, 1961 to 2001

Risk of harm from alcohol consumption

In 2001 the NHMRC published revised alcohol consumption guidelines for men and women. They are expressed in relation to the short-term and long-term risk of injury, ill health and death. An overview of the principal guidelines is in Box 3.6.

Box 3.6: Summary of Australian alcohol guidelines for short-term and long-term patterns of drinking

Men who consume no more than 4 standard drinks a day on average or no more than 28 drinks in a week avoid the ***long-term*** *risk of ill health and death related to alcohol and maximise the potential long-term health benefits.*

The equivalent amounts for women are 2 standard drinks per day on average and 14 over a week (because of their lower average body mass and the different way their bodies process alcohol).

Men who consume more than 6 standard drinks in any one day significantly increase the ***short-term*** *risk of health and social problems, including (but not only) the risk of injury or death from accident, assault and self-harm.*

For women the equivalent limit is 4 standard drinks.

Source: NHMRC 2001.

In Australia in 2001, 17.5% of the population could be classified as non-drinkers (Table 3.9). Some 60.5% of the population drank at levels of low risk in the short and long term and 8.2% drank at levels that risked harm in the short and long term.

Table 3.9: Risk of harm from alcohol consumption, persons aged 14 years and over, 2001

		Short-term risk[(a)]		
Long-term risk	**Abstainer**	**Low risk**	**Risky or high risk**	**Total**
		(per cent)		
Abstainer	17.5	. .	. .	17.5
Low risk	. .	60.5	12.1	72.7
Risky or high risk	. .	1.6	8.2	9.8
Total	**17.5**	**62.2**	**20.3**	**100.0**

(a) Monthly basis.

Note: For description of long- and short-term risk see Box 3.6.

Source: National Drug Strategy Household Survey 2001.

Drinking during pregnancy and breastfeeding

Australian women are advised to consider not drinking at all when pregnant or breastfeeding. They are advised that if they do drink they should avoid becoming intoxicated and in general should restrict their consumption to no more than seven standard drinks per week (NHMRC 2001). In 2001, it appeared that this advice was generally heeded:

- almost 60% of pregnant women (aged 14 years and older) reduced their consumption and a further 36% did not drink; and
- 66% of breastfeeding women (aged 14 years and older) reduced their consumption and a further 28% did not drink.

Overall, 53% of women aged 14–49 years consumed alcohol while pregnant or breastfeeding, compared with 84% of women in this age group that were not pregnant or breastfeeding (AIHW 2003c).

Use of illicit drugs

Illicit drug use refers to drugs such as marijuana, heroin, ecstasy and cocaine; volatile substances such as glue, solvent and petrol as inhalants; or the non-medical use of prescribed drugs.

Illicit drug use is a major risk factor for ill health and can also be a direct cause of death. Ill health associated with illicit drug use includes HIV/AIDS, hepatitis C virus (HCV), low birthweight, malnutrition, infective endocarditis (inflammation of the lining of the heart), poisoning, suicide, self-inflicted injury and death by drug overdose. Many of these conditions are the result of risky behaviours, for example sharing needles.

Illicit drug use was estimated to be responsible for 1.8% of the total burden of disease in Australia in 1996. The age-specific burden of disease attributable to illicit drug use peaked at 25–34 years of age. Around 1,000 people die from illicit drug use each year in Australia (AIHW 2002a). Globally, the WHO estimates that 0.4% of deaths (0.2 million) and 0.8% of the total burden of disease are attributable to illicit drug use (WHO 2002).

Trends in recent illicit drug use

Around 17% of people aged 14 years and over reported using illicit drugs in 2001, and this figure has fluctuated moderately over the 10-year period from 1991 (Table 3.10). Marijuana/cannabis was the most common recently used illicit drug for those aged 14 years and over, and this remained stable at around 13% of those surveyed between 1991 and 2001, except for 1998 when the figure was 18%. Amphetamines were the second most commonly used illicit drug at an average of around 2.8% from 1991 to 2001. The recent use of ecstasy has increased from 1.1% in 1991 to 2.9% in 2001.

Table 3.10: Summary of recent[(a)] illicit drug use: proportion of the population aged 14 years and over, 1991 to 2001

Substance/behaviour	1991	1993	1995	1998	2001
			(per cent)		
Marijuana/cannabis	13.7	12.7	13.1	17.9	12.9
Pain killers/analgesics[(b)]	n.a	1.7	3.5	5.2	3.1
Tranquillisers/sleeping pills[(b)]	n.a	0.9	0.6	3.0	1.1
Steroids[(b)]	n.a	0.3	0.2	0.2	0.2
Barbiturates[(b)]	1.5	0.4	0.2	0.3	0.2
Inhalants	0.8	0.6	0.6	0.9	0.4
Heroin	0.4	0.2	0.4	0.8	0.2
Methadone[(c)]	n.a	n.a	n.a	0.2	0.1
Other opiates[(b)]	n.a	n.a	n.a	n.a	0.3
Amphetamines[(b)]	2.6	2.0	2.1	3.7	3.4
Cocaine	0.7	0.5	1.0	1.4	1.3
Hallucinogens	1.6	1.3	1.8	3.0	1.1
Ecstasy/designer drugs	1.1	1.2	0.9	2.4	2.9
Injected drugs	0.5	0.5	0.6	0.8	0.6
Any illicit drug	*22.8*	*14.0*	*17.0*	*22.0*	*16.9*
None of the above	77.2	86.0	83.0	78.0	83.1

(a) Used in last 12 months.

(b) For non-medical purposes.

(c) For non-maintenance purposes.

Source: AIHW 2003c.

Injecting drug use history

The duration of injecting drug use is associated with a higher risk of transmitting bloodborne viruses such as HIV and HCV. A 2002 survey of injecting drug users showed that 69% of people with a history of injecting drug use for 10 years or more tested positive to HCV compared with 38% of people with a history of injecting drug use of less than three years (Table 3.11). A total of 56% of the people tested positive to the HCV virus with a clear association between the duration of injecting drug use and the presence of HCV antibody. A total of 1.3% of people who were injecting drug users tested positive to the HIV antibody.

Table 3.11: Prevalence of HIV or HCV antibodies among injecting drug users aged 14 years and over, by history of injecting drug use, 2002

History of injecting drug use	Tested positive to HIV antibody			Tested positive to HCV antibody		
	Males	Females	Persons[(a)]	Males	Females	Persons[(a)]
			(per cent)			
Less than 3 years	1.3	—	0.9	38	38	38
3–5 years	0.9	1.3	1.1	46	43	45
6–10 years	0.8	—	0.7	47	55	50
10 or more years	2.3	0.6	1.9	69	67	69
History not reported	2.4	—	1.5	41	44	43
Total	**1.6**	**0.5**	**1.3**	**56**	**55**	**56**

(a) Includes people whose sex was reported as transgender or whose sex was not reported.

Source: NCHECR 2003.

Vaccination status

Vaccination is the administration of a vaccine that protects children and adults against some infectious diseases. There are two main purposes of vaccination. First, it is the most effective way of providing individual protection against diseases. Second, if enough people in a population are vaccinated, the spread of infection is limited and the disease can be controlled or, in some cases, eliminated. For example, smallpox has been eliminated worldwide, and poliomyelitis eradicated in most parts of the world including the Western Pacific region. This has allowed routine smallpox vaccination to be discontinued but vaccination against poliomyelitis must be continued because of the potential for reintroduction from areas where infection persists.

Vaccination in children

Childhood vaccination has been routinely used for over fifty years in Australia and has had a significant impact on the morbidity and mortality associated with many diseases (Gidding et al. 2001). In the late 1800s, vaccines were developed against smallpox, plague and typhoid, and were used extensively throughout Australia. Over time, new vaccines have been developed for a range of infectious diseases and large-scale vaccination programs have been implemented. Diseases targeted by the Australian childhood vaccination program in 2002 were diphtheria, tetanus, whooping cough (pertussis), poliomyelitis, measles, mumps, rubella, *Haemophilus influenzae* type B (Hib) and hepatitis B. A schedule of vaccination is provided in the *Australian Immunisation Handbook* (NHMRC 2003c) and sets out the time frames (from birth) for a vaccination provider to administer the vaccine for each disease.

In 1997, to improve vaccination coverage in Australia, the Federal Government initiated the Immunise Australia campaign. The main goals of the program were to achieve:

- greater than 90% vaccination coverage of children at 2 years of age for all diseases specified in the schedule;
- near-universal vaccination coverage at school entry; and
- near-universal vaccination coverage of girls and boys under 17 years of age for MMR (measles, mumps and rubella).

To accomplish these goals, the Seven Point Plan was announced which included initiatives for parents (Maternity Allowance and Childcare Assistance Rebate), a larger role for GPs (through the introduction of the General Practitioner Immunisation Incentives) and measles eradication.

Vaccination coverage

Vaccination coverage in Australia is monitored through the Australian Childhood Immunisation Register (ACIR), operated by the Health Insurance Commission with the cooperation of the state and territory health departments. This register contains vaccination data since 1 January 1996 for Australian children under 7 years of age, which forms the basis of the ACIR. The register is updated from Medicare enrolments to obtain the total number of children in Australia under 7 years of age. The vaccination status of each child is updated when a vaccination provider administers the age-appropriate vaccination and notifies the ACIR of this vaccination encounter. Vaccination coverage estimates are reported as the percentage of a three-month birth cohort of children who are up to date for the relevant vaccinations by the time they are 1 year, 2 years, and 6 years of age (O'Brien et al. 1998).

For Australia as a whole, vaccination coverage at 1 year of age calculated at 31 March 2002 was 90.5% (Table 3.12). Western Australia had the lowest proportion of children fully vaccinated at 1 year of age at 88.0% and the Australian Capital Territory had the highest proportion at 91.4%. Vaccination coverage for Australia at 1 year of age was highest for the Hib vaccine (94.5%) and the hepatitis B vaccine (94.4%) and lowest for the poliomyelitis vaccine (91.9%), but coverage for all individual vaccines was greater in all jurisdictions than the 90% target.

Table 3.12: Proportion of children vaccinated at 1 year of age[(a)] for the birth cohort born 1 October to 31 December 2000; assessment date 31 March 2002

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Number of children	21,340	15,258	12,019	5,848	4,231	1,535	1,084	845	62,160
Diphtheria, tetanus and pertussis (%)	91.9	92.8	92.0	90.1	92.2	92.1	92.9	90.7	92.0
Poliomyelitis (%)	91.8	92.8	91.9	90.0	92.0	92.1	92.8	90.5	91.9
Haemophilus influenzae type b (%)	94.5	95.0	94.3	93.1	94.5	95.7	94.7	96.1	94.5
Hepatitis B (%)	94.7	94.1	94.8	92.2	94.9	94.9	95.0	96.3	94.4
Fully immunised (%)[(b)]	**90.6**	**91.0**	**90.8**	**88.0**	**90.6**	**91.0**	**91.4**	**89.7**	**90.5**

(a) Aged 12–15 months at 31 December 2001.

(b) Fully immunised (%) = no. children vaccinated/no. children in register × 100.

Source: Australian Childhood Immunisation Register.

The proportion of children fully vaccinated at 2 years of age was lower and below target at 87.8% (Table 3.13). Tasmania had the highest percentage of children fully vaccinated at 2 years of age at 89.6% and the Northern Territory had the lowest proportion of children fully vaccinated at 85.9%. For individual vaccines, coverage for diphtheria, tetanus and pertussis vaccine at 2 years of age was the lowest at 90.2% whilst coverage was highest for Hib vaccine at 95.4%.

Table 3.13: Proportion of children vaccinated at 2 years of age[(a)] for the birth cohort born 1 October to 31 December 1999; assessment date 31 March 2002

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Number of children	20,711	15,149	11,714	6,132	4,417	1,483	999	759	61,364
Diphtheria, tetanus and pertussis (%)	89.7	90.9	91.1	89.1	90.0	90.4	89.9	86.8	90.2
Poliomyelitis (%)	94.1	95.2	94.0	93.8	94.6	96.1	95.0	94.6	94.4
Haemophilus influenzae type b (%)	95.4	96.1	95.0	94.7	95.4	96.6	95.8	94.1	95.4
Measles, mumps and rubella (%)	92.8	94.1	93.2	92.9	93.2	95.1	94.4	94.2	93.4
Fully immunised (%)[(b)]	**86.9**	**88.8**	**88.8**	**86.3**	**87.5**	**89.6**	**88.5**	**85.9**	**87.8**

(a) Aged 24–27 months at 31 December 2001.

(b) Fully immunised (%) = no. children vaccinated/no. children in register × 100.

Source: Australian Childhood Immunisation Register.

Vaccination coverage at 6 years of age for Australia, assessed for the first time in 2002, was considerably lower at 80.6% (Table 3.14). Victoria had the highest percentage of children fully vaccinated at 6 years of age at 83.3% and the Northern Territory had the lowest proportion at 72.0%. Vaccination coverage for Australia at 6 years of age was highest for poliomyelitis vaccine (84.0%) and lowest for the MMR vaccine (82.4%).

Table 3.14: Proportion of children vaccinated at 6 years of age[(a)] for the birth cohort born 1 January to 31 March 1996; assessment date 30 June 2002

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Number of children	21,859	15,885	12,715	6,621	4,818	1,555	1,031	881	65,365
Diphtheria, tetanus and pertussis (%)	83.2	85.0	84.5	81.2	84.7	82.4	83.7	75.8	83.7
Poliomyelitis (%)	83.2	85.6	84.9	81.3	84.9	83.1	83.7	76.4	84.0
Measles, mumps and rubella (%)	80.0	85.0	84.1	80.6	83.4	81.4	82.7	76.4	82.4
Fully immunised (%)[(b)]	**78.3**	**83.3**	**82.6**	**78.3**	**81.8**	**79.7**	**81.3**	**72.0**	**80.6**

(a) Aged 72–75 months at 31 March 2002.

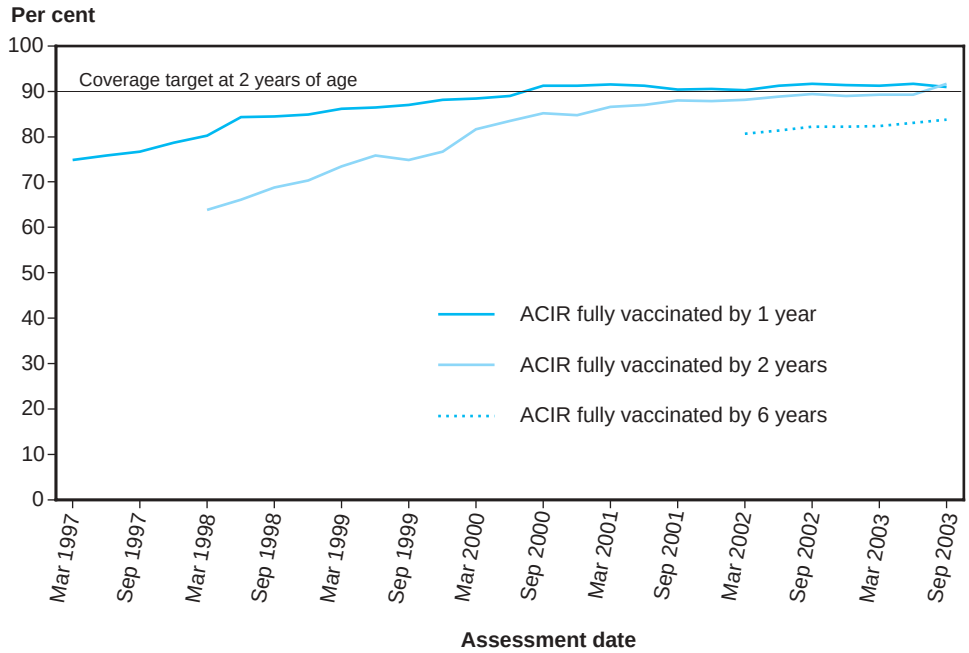
(b) Fully immunised (%) = no. children vaccinated/no. children in register x 100.

Source: Australian Childhood Immunisation Register.

Recorded coverage at all three milestone ages is less than 100% due to both underreporting of vaccinations to the ACIR by providers and incomplete vaccination uptake. 'Parents disagreeing with or having concerns about vaccination' is the main reason why uptake is incomplete (Hull et al. 2002).

Figure 3.15 shows the trends in vaccination coverage, from the first ACIR-derived published coverage estimates in 1997 to the current estimates. There is a clear trend of

increasing vaccination coverage over time for children aged 1, 2 and 6 years, although the rate of increase has slowed over the past two years, especially for children in the 1-year and 2-year age groups.



Note: Coverage assessed on last day of the month.

Figure 3.15: Trends in vaccination coverage, 1997 to 2003

Influenza vaccination coverage in older people

Vaccination against influenza is available in Australia and is free to those aged 65 years and over, for Indigenous Australians aged 50 years and over, and for Indigenous Australians aged 15–49 years in high-risk groups. The Influenza Vaccine Program for Older Australians was introduced in 1999, and is designed to remove cost and physical barriers that may have prevented older persons from having influenza vaccines in the past.

In recent years, national telephone surveys have been conducted annually to monitor the proportion of Australians aged 65 years and over vaccinated for influenza. In 1998, 61% of that age group were vaccinated. In 2003, the proportion had increased to 77%, with increases occurring in all states and territories (AIHW 2004b).

Of those aged 65 years and over and not vaccinated in 2003, 17% reported having had an influenza vaccination in the previous year and 21% reported intending to have an influenza vaccination in the next year.

Sexual practices

Sexual activity can carry health risks such as sexually transmitted infections (STIs) and cancer of the cervix. It can also lead to unplanned pregnancy. Some STIs such as HIV can also be passed to children born to infected mothers. The risks are mainly due to 'unsafe sex', where precautions are not taken against transmitting infections or against unintended pregnancy. Unsafe sex can lead to infections such as chlamydia, gonorrhoea, genital herpes, genital warts, syphilis, hepatitis B and HIV/AIDS. The use of condoms is very important in preventing the spread of STIs, HIV in particular.

A recent survey, the Australian Study of Health and Relationships, collected information about the sexual health, experience and attitudes of Australian adults including contraceptive practices, the frequency and extent of STIs, and knowledge about STIs and HIV/AIDS. The survey, conducted between May 2000 and June 2001, used computer-assisted telephone interviews and involved nearly 20,000 Australian adults aged 16–59 years from all states and territories (Smith et al. 2003).

Of those at risk of pregnancy (that is, women aged aged 16–59 years who were heterosexually active and fertile but not pregnant or trying to become pregnant), 95% were using some form of contraception. Among all women in the survey, oral contraceptives were the most frequently used method (34%), with sterilisation (tubal ligation/hysterectomy) the second most common method (23%), followed by condom use (21%) and vasectomy of partner (19%). As expected, the method of contraception depended on age. The pill and condoms were the most common form of contraception among 16–19-year-olds whereas among 40–49-year-olds tubal ligation and vasectomy of partner were more commonly used (Table 3.15).

Table 3.15: Some of the most commonly used forms of contraception among women exposed to the risk of pregnancy, by age group, 2000–2001

Age (years)	Contraceptive pill	Tubal ligation/ hysterectomy	Condom	Vasectomy
		(per cent)		
16–19	51.2	0.4	53.2	0.0
20–29	63.3	0.9	32.8	0.6
30–39	31.6	15.1	17.9	20.6
40–49	11.7	33.0	10.8	34.6
50–59	2.8	59.9	5.1	24.3

Note: More than one contraceptive method could be reported.

Source: Richters et al. 2003.

The majority of respondents in the study had used a condom at some time in their lives. However, among those who engaged in casual heterosexual activity in the past six months, fewer than half had used a condom (45% of men and 35% of women). Among male and female heterosexuals in the survey, condom use was higher in people who were younger, had higher levels of education, lived in major cities, had lower levels of income and who had more than one partner in the past year. Condom use for heterosexual activity was less likely among men in the survey who consumed alcohol in

excess according to the NHMRC guidelines; this was not the case among women. Among men who reported having sex with men in the past year, only 59% had used a condom (de Visser et al. 2003).

STIs were common among sexually active respondents in the survey. Overall, 20% of men and 17% of women reported having ever been diagnosed with an STI or blood-borne virus. Recent infection was higher among those who identified as homosexual or bisexual, had engaged in sex work or had been a client of a sex worker, had reported injecting drug use or had reported having more than one partner in the past year. Rates of infection among respondents with an Aboriginal or Torres Strait Islander background were similar to those of other Australians. Around 40% of men and women reported having been tested for HIV at some time in their lives, which is substantially higher than is found in United States, British and European national surveys, and was particularly high in those at risk of HIV infection such as homosexual men or among those who had injected illicit drugs (Grulich et al. 2003b).

Knowledge of transmission routes and health consequences of the most common STIs (in particular gonorrhoea, genital warts and chlamydia) is poor. Individuals with the best STI knowledge were those who identified as homosexual or bisexual and individuals with a history of an STI. Women were found to have significantly more knowledge about STIs than men. Higher educational and occupational status among both men and women were associated with better knowledge (Grulich et al. 2003a).

3.4 Socioeconomic characteristics

The strong association between health and socioeconomic factors both within and between countries is well documented. However, the mechanisms behind this association are less clear (Pearce & Davey Smith 2003; Marmot 1999).

Socioeconomic factors that influence health include education, income, occupation, and characteristics of the area of residence (Lynch & Kaplan 2000). Social and economic disadvantages (for example poor education, unemployment and few assets) tend to occur together and magnify the negative effects on health.

While the mechanisms through which socioeconomic factors act on health continue to be researched and discussed, a number of perspectives contribute to our understanding (Mackenbach & Howden-Chapman 2003; Adler & Ostrove 1999). It is widely acknowledged that the availability of material resources and the income to buy them affect health. This is demonstrated through higher income countries having better health than lower income countries, and individuals with higher incomes within countries having better health than their lower income counterparts. Increasingly, it is also being suggested that less favourable social and economic circumstances can cause anxiety, low self-esteem and social isolation, which in turn can influence health-related behaviours and health itself.

This section describes socioeconomic determinants in their own right, rather than their relationships with health. In Australia, men and women with lower socioeconomic status, including many Indigenous people, bear a higher burden of disease. These patterns are described in Chapter 4.

Socioeconomic indicators

The main socioeconomic factors identified as important for health are education, income, employment status, and geographical area characteristics. These factors also overlap. For example, higher levels of education are more likely to result in better employment prospects and higher income. Often one or more of these socioeconomic factors is used to define socioeconomic groups in the population (as in Chapter 4). In this section, indicators of education and income are presented, drawing substantially on recent work examining welfare indicators, where further details can also be found (AIHW 2003d).

Education

Education is an important determinant of health, particularly through its link to future occupational opportunities and income potential. It also provides knowledge and skills on how individuals can improve their own health and on available health services (Adler & Newman 2002). Two measures of education are briefly described here: school retention rates and educational attainment.

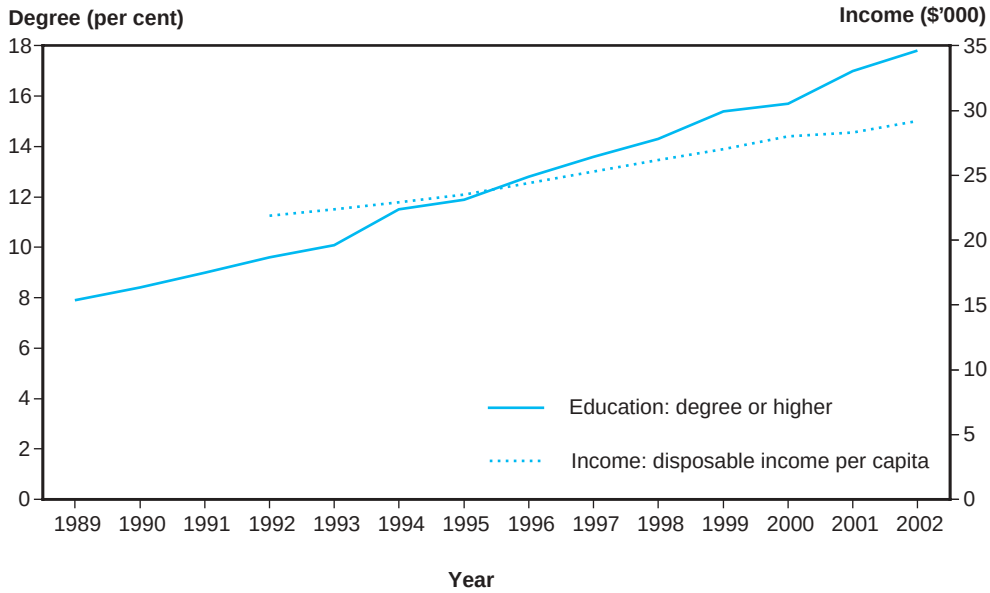
Retention rates provide an indication of the percentage of students that completes high school. This section presents data on the 'apparent retention rate' from the beginning of high school to Year 12. The term 'apparent' reflects that no adjustments are made for movements of students in and out of the country or between states and territories. The most recent national data show that in 2002 around three-quarters of students stayed at school until Year 12. Females had higher apparent retention rates than males (81% compared to 70%), and rates for Indigenous students were considerably lower (38%) than for all Australians (75%) (ABS 2003d).

Educational attainment measures the highest level of completed education for an individual. In 2002, 20% of Australians aged 25–64 years held a bachelor degree or above, another 26% a certificate or diploma, and for a further 54% their highest level of completed education was Year 12 or lower. These percentages differ by age group, indicating that levels of education have been increasing over time. Thus a higher proportion (25%) of those aged 25–34 years held a bachelor's degree or higher compared with those aged 55–64 years (13%) (ABS 2002a).

Longer term trends in education levels indicate that Australia has made large advances in this area over the last 15 years (Figure 3.16). Education levels have increased, as indicated by the consistent trend data available on the proportion of people age 15–64 years that holds a bachelor's degree or higher, which more than doubled from 8% to 18% between 1989 and 2002. These gains will have contributed to improvements in population health status.

Income

The link between income and health occurs through the income level of the country, the income of individuals, and the distribution of income (Marmot 2002; Turrell & Mathers 2000). Higher incomes can enable purchase of health-related goods and services such as better food, housing, recreation and health care, and may provide psychological benefits such as a greater sense of control. Two indicators of income are presented here: weekly household income and income disadvantage.



Notes

1. Educational attainment is the percentage of people aged 15–64 years that holds a bachelor degree or above.
2. Income is the real net national disposable income per person. Reference year 2000–01.

Source: ABS 1996, 2003d.

Figure 3.16: Educational attainment and disposable income, 1989 to 2002

Weekly income data show that in 2000–01 the median weekly disposable income in Australia was $414 per household (adjusted for household size). For the lowest 20% of households, this median income was $202, while for the highest 20% it was $802. Disposable income is calculated as gross income less direct tax and Medicare levy (ABS 2003e).

Measures of income disadvantage are often used to identify households with levels of income below a defined threshold. The measure of income disadvantage presented here is the proportion of households with a weekly disposable income below 50% of the median; this and other measures of income disadvantage and 'poverty' are further detailed elsewhere (AIHW: Bricknell et al. 2004). In 2000–01, 10.9% of households in Australia had incomes below 50% of the median disposable income. In an even more disadvantaged situation are the 5.2% of households with incomes below 40% of the median disposable income. It is likely that the lowest income households are at greater risk of health-related problems than other households.

In addition, the link between the distribution of income—or income inequality—and health remains an area of continued discussion in the research literature. It has been argued that higher levels of income inequality within a population have a negative effect on health, over and above levels of absolute income. However, absolute income is likely to be more important than the level of income inequality (Mackenbach & Howden-Chapman 2003; Pearce & Davey Smith 2003). Income inequality can be

measured, and recent analysis suggests that levels of income inequality in Australia have remained stable in recent years (NHPC forthcoming).

As was the case for education levels, longer term trends in income levels show large advances over the last 15 years (Figure 3.16). Net disposable income per person has increased from a little under $22,000 to just over $29,000 between 1992 and 2002 (in real terms). Again, these gains will have contributed to improvements in population health status.

3.5 Environmental factors

Environmental factors include a vast array of physical, chemical, and biological conditions and agents that may affect human health, both positively and negatively. Clean air, water and food, and safe human-made environments greatly benefit the health and wellbeing of individuals and communities. On the other hand, the natural environment and human-caused changes such as land degradation and global warming may be harmful.

The environment's influence on health can be direct or indirect, obvious or subtle, straightforward or complex, and immediate or delayed. This makes it very challenging to estimate the full range and size of the harmful health effects that can be linked to the environment. Nevertheless, a number of respiratory complaints can be attributed to gases, particles, micro-organisms and pollens in the air. In addition, certain chemicals and micro-organisms in food and water can lead to intestinal and neurological diseases; insects such as mosquitoes and fleas can transmit a large number of serious diseases; and human-made environments can contain hazards such as noise and traffic. Also, there is a clear excess of deaths in the winter months, although this may be decreasing (AIHW: de Looper 2002).

According to the 2001 state of the environment report (Australian State of the Environment Committee 2001), urban air quality has generally improved since 1996, streetscapes and parks have improved in most urban areas, and energy efficiency in residences has improved. However, over the same period the quality of water bodies deteriorated and invasive species have continued to pose a serious problem. Furthermore, many of the warmest years on record have occurred in the last two decades.

Air pollution

The air can be contaminated by pollutants, micro-organisms and odours, all of which can be harmful. Exposure to air pollutants has been associated with cardiovascular disease, respiratory illness and other problems such as preterm births.

In Australia, the National Environment Protection Council has identified and set National Environment Protection Measures for six major ambient air pollutants: airborne particles (particulate matter with diameters of up to 10 microns), carbon monoxide, nitrogen dioxide, sulphur dioxide, ozone, and lead. Ambient air pollution in Australia is primarily caused by emissions from motor vehicles (especially from diesel fuel), and heavy industry and mining activities. Air may also contain emissions from the combustion of fossil fuels for electricity generation, smoke from home heating and bush fires, and wind-blown dust. Indoor air may contain other harmful substances such as volatile organic compounds, fibres, moulds and tobacco smoke.

Globally, air pollution is estimated to cause approximately 5% of lung cancer deaths, 2% of cardiorespiratory mortality, and about 1% of respiratory infection mortality (WHO 2002). Studies in the United States (Pope et al. 2002) and Europe (Kunzli et al. 2000) have attributed 4–6% of total mortality to air pollution. Although Australia's ambient air quality is comparatively good, studies based in Brisbane, Sydney and Melbourne have found an association between air pollution levels and mortality and/or hospital admissions (EPA Victoria 2000, 2001; Morgan et al. 1998a, 1998b; Petroeschevsky et al. 2001). Lead exposure damages nerve function and can be a particular concern in the mental development of children. However, the concentration of lead in the air has decreased substantially in Australia since unleaded fuels were introduced in the mid-1980s (Australian State of the Environment Committee 2001).

Water and food contamination

Safe water and food are important for general health. Further benefit can be obtained through the fluoridation of water supplies, which helps to prevent dental decay (see Box 3.7). Recreational water bodies such as pools, spas and 'swimming holes' can benefit health and wellbeing through improved physical fitness and quality of life.

Box 3.7: Population exposure to fluoridated drinking water

The most effective public health measure for preventing dental decay is the adjustment of fluoride in drinking water to a range of 0.5 ppm to 1.0 ppm (varying by climate to reflect differences in patterns of water consumption). Over two-thirds of Australians (69.1%) live in areas where the public water supply meets these requirements. High percentages in most states and territories reflect the fact that their capital cities are fluoridated. The exception is Queensland, where Brisbane and most regional centres are not fluoridated.

Exposure to fluoridated drinking water[(a)]

State/territory	% of population
NSW	89.8
Vic	75.3
Qld	4.7
SA	90.2
WA	90.1
Tas	94.7
NT	84.2
ACT	100.0

(a) Percentage of state/territory population living in areas with fluoride in public water supplies. Fluoride from natural or engineering sources at concentrations of 0.7 ppm or more (except SA and NT where concentration is 0.5 ppm or more).

Water and food can also be hazardous to human health. Drinking water and water for cooking, domestic use, personal hygiene and recreation can be contaminated with bacteria natural to the environment (for example *Clostridium botulinum*) as well as bacteria and parasites (for example *Giardia*) from animal sources. Inorganic chemicals such as nitrates and organic chemicals such as disinfectant by-products can also contaminate water. Food can be contaminated by bacteria, viruses and parasites through unhygienic handling, and by biological toxins (for example toxic mushrooms and moulds) and chemicals (for example pesticides and heavy metals).

According to the *World Health Report 2002* (WHO 2002), about 3.1% of deaths worldwide (1.7 million) are attributable to unsafe water and poor sanitation or hygiene. All but about 0.2% of these deaths occur in developing countries. It has been estimated that in a typical year there are between 4.0 and 6.9 million cases of foodborne gastroenteritis in Australia (OzFoodNet Working Group 2003). Identifying whether gastrointestinal diseases have been transmitted by contaminated water or food, or by person-to-person contact is difficult. Nevertheless, in Australia the proportion of gastrointestinal disease attributable to drinking water is likely to be small (McConnell et al. 2001).

Vectorborne and zoonotic diseases

The prevalence of vectorborne and zoonotic diseases (diseases which can be transmitted from animals to humans) fluctuates considerably with changes in the weather, the prevalence and spread of disease vectors such as mosquitoes, and the movement of people into areas with high vector populations. Changes in the environment and climate, as may be associated with global warming, may influence the prevalence and geographic distribution of some vectorborne diseases within Australia.

Mosquitoes are highly efficient vectors of viruses and protozoa which affect humans. In Australia, they transmit diseases such as Ross River virus disease, Murray Valley encephalitis and Japanese encephalitis (see Chapter 2). Malaria kills many people worldwide every year but is not endemic in Australia. Other diseases can be spread by ticks and flies. Flies are also responsible for the spread of the eye disease trachoma in remote Indigenous communities. Mammals and birds can also be reservoirs for a variety of pathogens that cause diseases in humans.

Built environments

The built environment consists of the structures and spaces built or modified by people. These include houses, commercial and public buildings, parks and roads. Well-designed built environments can be beneficial to health and wellbeing by providing green spaces, safe roads, and bicycle and walking paths. Dwellings can be designed to minimise exposure to allergens, microbes and physical hazards, and to reduce energy consumption. Built environments may also contain physical hazards such as machinery and poor lighting in the workplace, and chemical hazards such as tobacco smoke and solvents in the home. Hazards may also be created by the design of the built environment. High-density living spaces, for example, create conditions favourable to the spread of infectious diseases. On the other hand, urban sprawl can encourage reliance on motor vehicle transport and deter physical activity. This contributes to traffic noise, air pollution and traffic accidents. Recent research from the United States has linked urban sprawl to obesity and high blood pressure (Ewing et al. 2003).

Ecology

As a discipline, environmental health has traditionally focused on the health effects attributable to environmental exposures, such as those described above. In recent times, it has taken a more ecological approach ('ecology' being the study of the relationship

between organisms and their natural and social environments). Natural processes and human activities place great stress on ecological systems on both a global and local level. The result may be changes to the environment including:

- global warming
- extreme weather events
- depletion of stratospheric ozone
- deforestation
- land degradation
- loss of biodiversity
- coastal pollution
- depletion and contamination of freshwater.

These changes may have both beneficial and harmful effects on humans. For example, land clearing can deny habitats to disease-carrying animals and insects. Conversely, land clearing can also allow the emergence and spread of disease-carrying animals and insects, while a warmer climate may influence their geographic range and the frequency, timing and intensity of disease outbreaks (McMichael 2001).

In general, effects on human health determined by natural or human-made changes to the environment are difficult to measure or forecast. For example, although many exposure–effect relationships are well established, it is difficult to accurately factor in the moderating influences of evolving demographics, economics and technology with certainty. There are concerns over the potential health impact of environmental changes, especially climate changes. For example, see McMichael et al. (2003).

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4 Population health

The health of a nation is defined in many ways—birth rates, death rates, life expectancies, incidence of disease and self-perceptions of health status. Regardless of how health is measured, good health is not equally shared by all people in Australia, and the health issues for various groups are different. This chapter, therefore, focuses on various population groups and their health, rather than on the general population as in other chapters.

The chapter highlights key health areas over important stages of the lifespan, by summarising the health of mothers and their babies, children and young people. The health of older Australians is explored in detail in Chapter 8.

As people of all ages may have special health needs and problems depending on their socioeconomic position, geographic location or cultural background, the chapter also examines population groups defined along these lines, along with specially serviced populations such as veterans and prisoners, and a new section on those whose health is complicated by disability.

While other chapters in *Australia's Health* highlight population-specific issues among discussions of diseases, health services and information collection, this chapter brings together the areas of relevance for each of these population groups. It contrasts the health status of different groups, thus highlighting what might be achieved if all groups had a similar level of health. This information is important for public health and social policy because the different groups may benefit from different approaches to preventive programs (for example, targeting specific risk factors, health awareness programs or screening programs), health-related communication (for example, language-specific communication materials) and service delivery (for example, mobile services).

4.1 Mothers and babies

Recent years have seen some notable trends in the area of reproduction. Numbers of births in Australia have been generally decreasing, as have fertility rates and perinatal deaths. In contrast, the proportion of multiple births has been increasing. This section provides information on these and other trends, as well as information on assisted reproductive technology (ART), pregnancy termination, birthweight, type of delivery and maternal mortality.

Fertility

The total fertility rate refers to the number of babies a woman could expect to bear, on average, during her lifetime if she experienced current age-specific fertility rates throughout her child-bearing life. Since 1961, when each woman averaged 3.55 babies, the total fertility rate has declined to 1.75 births per woman in 2002 (ABS 2003b). This is notably below the replacement fertility level of 2.1 babies per woman—the number of

babies a woman would need to have during her lifetime to replace both herself and her partner. This trend for fertility to drop below replacement level is occurring in most developed, and some developing, countries.

Aided by effective and available methods of fertility control, Australian women are increasingly delaying childbearing for a number of social, economic and cultural reasons. In 2002, the highest fertility occurred in women aged 30–34 years, at a rate of 111.2 babies per 1,000 women, continuing the trend of the previous two years. This group experienced slightly higher fertility than the 25–29 year age group (104.2 babies per 1,000 women). The main decline in the fertility rate over the past 20 years has occurred among the 20–24 and 25–29 age groups. Meanwhile, fertility has continued to increase in women aged 40 and over (ABS 2003b), and ART has played a role in this.

Live births

There were 250,988 live births registered in Australia in 2002 (ABS 2003b), and the annual number has steadily declined since 1992, although there were slight increases in 2000 and again in 2002. The crude birth rate, which is the number of live births per 1,000 population, was 12.8 in 2002. This compares with 15.8 in 1982 (ABS 2003b).

Australia's crude birth rate for 2001 lies between those of the United Kingdom (11 live births per 1,000 population) and the United States (15 per 1,000 population). New Zealand also had a crude birth rate of 15, while Japan's was lower, at 9 in 2001 (World Bank 2003).

Age-specific birth rates

Age-specific birth rates express the number of live births to women in a particular age group per 1,000 women of the same age group in the population in a given year.

In 2002, the peak birth rate among all age groups was in those aged 30–34 (111.2 per 1,000 women) (ABS 2003b). This trend of delayed childbearing can be attributed to a number of factors including social, educational and economic influences, increased access to ART and longer reproductive life expectancy.

Among teenage mothers aged 15–19 years, the birth rate declined from 27.4 births per 1,000 women in 1982 to 17.1 in 2002. Even in the last few years, the decline has been large, down from 22.0 in 1992 to 17.7 in 2000. When compared with the 1982 rate, the 2002 rate represents an overall decline of 38% (ABS 2003b).

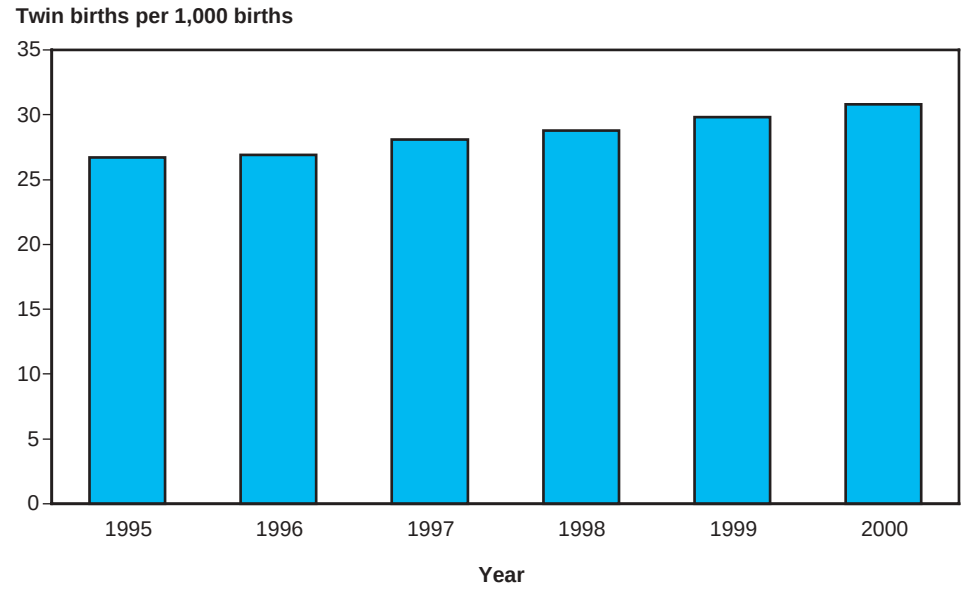
This trend is more pronounced among women in the 20–24 year age group. The birth rate decreased from 103.9 in 1982 to 75.0 in 1991 and 55.5 in 2002, representing an overall decline of 47% in birth rates over the period 1982–2002.

The lowest birth rate for women aged 35–39 years was in 1978, with 23.5 per 1,000 women giving birth, gradually increasing to a historical high of 52.2 in 2002, representing an increase of over 100%.

The birth rate for women aged 40–44 years showed a similar trend, with rates more than doubling over the period 1982–2002. In 2002, there were 9.7 births per 1,000 women compared with 4.5 per 1,000 women in 1982 (ABS 2003b).

Multiple births

The increasing rate of multiple births in Australia continued in 2000. There were 7,933 twin, and 310 triplet and higher order multiple births in 2000, representing 3.1% and 0.1% of all births in Australia, respectively. The associated multiple birth rate in 2000 was 32.0 per 1,000 births, increasing 15.0% from 27.8 in 1995. The twin birth rate has steadily increased from 26.7 twins per 1,000 births in 1995 to 30.8 in 2000—a 15.3% increase (Figure 4.1).



Source: AIHW National Perinatal Statistics Unit perinatal data collection.

Figure 4.1: Twin birth proportions, 1995 to 2000

Several factors have influenced the rising rate of multiple births, including the change in the maternal age distribution (more older mothers) and the increased use of fertility drugs and assisted conception to treat infertile couples.

Birthweight

A key indicator of infant health is the proportion of babies with a birthweight of less than 2,500 grams. These low-birthweight babies have a greater risk of poor health and dying, require a longer period of hospitalisation after birth, and are more likely to develop significant disabilities.

In 2000, the average birthweight of all live-born and stillborn babies was 3,367 grams. The average birthweight of males (3,429 grams) was slightly higher than that of females (3,302 grams). There were 17,475 low-birthweight babies in 2000, representing 6.8% of all births, up from 6.3% in 1991. Low birthweight was more likely among female babies (7.3%) than male babies (6.3%). More male babies (48.4%) than females (37.7%) had a birthweight of 3,500 grams or over.

Singleton babies have higher birthweights than multiple-birth babies. In 2000, the average birthweight for singleton live births was 3,413 grams, while that for multiple live births was 2,383 grams.

Type of delivery

Almost two-thirds (64.9%) of all confinements resulted in spontaneous vaginal deliveries in 2000; 23.3% involved caesarean section deliveries and 11.8% involved forceps, vacuum extraction and/or vaginal breech delivery. Obstetric intervention generally occurs if serious complications arise during pregnancy or labour. In 2000, there were marked differences among states and territories in the use of forceps and vacuum extraction (Table 4.1). Victoria recorded the highest percentage of forceps delivery (6.9%), and the Northern Territory the lowest (3.3%). The percentage of vacuum extraction varied, ranging from 3.4% of deliveries in the Northern Territory to 9.0% of deliveries in Western Australia.

Table 4.1: Type of delivery, states and territories, 2000

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
					Number				
Total confinements	86,462	61,573	48,514	24,818	17,578	5,808	4,684	3,629	253,066
					Per cent				
Spontaneous vaginal	67.1	63.2	65.3	60.8	61.7	68.0	65.7	71.9	64.9
Forceps	4.5	6.9	3.7	4.3	6.4	5.3	6.5	3.3	5.1
Vacuum extraction	6.2	5.9	4.8	9.0	6.3	4.2	5.7	3.4	6.1
Vaginal breech	0.8	0.6	0.5	0.6	0.5	0.4	0.4	0.5	0.6
Caesarean section	21.3	23.4	25.6	25.3	25.2	21.7	21.7	20.8	23.3
Other/unknown	—	—	—	—	—	0.5	—	0.1	—
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: AIHW National Perinatal Statistics Unit perinatal data collection.

The percentage of women having caesarean sections has increased significantly from 18.0% in 1991 (AIHW: Lancaster et al. 1994) to 23.3% in 2000. In Queensland, Western Australia and South Australia, a quarter of confinements resulted in caesarean section deliveries in 2000 (25.6%, 25.3% and 25.2% respectively). The Northern Territory reported the lowest rate—20.8% of deliveries in 2000.

Assisted reproductive technology (ART) and the health of ART babies

Since 1979, ART has been used in Australia to help couples achieve pregnancy. The main ART procedures include in-vitro fertilisation (IVF), where eggs and sperm are combined in the laboratory for fertilisation outside the body and then replaced into the uterus; intra-cytoplasmic sperm injection (ICSI), where a single sperm is injected into an egg for fertilisation outside the body and then replaced into the uterus; and gamete intra-fallopian transfer (GIFT), where eggs and sperm are placed in the uterus for

fertilisation inside the body. Since 1992, the total number of ART treatment cycles has increased by 76.8%, showing the escalating demand for fertility services in Australia. In 2000, 4,801 babies were born following ART treatment, accounting for 1.9% of all Australian births (AIHW: Dean & Sullivan 2003).

The success of ART varies by treatment procedure and whether fresh or thawed embryos or gametes are used. In 2001, with the transfer of fresh embryos or gametes, a viable pregnancy (a pregnancy of at least 20 weeks gestation) was achieved in 20.8% of all IVF egg retrieval cycles, 25.9% of ICSI cycles and 19.7% of GIFT cycles. With the transfer of thawed embryos, a viable pregnancy was achieved in 15.5% of all IVF embryo transfer cycles and 14.7% of all ICSI cycles. When all ART techniques are combined, a viable pregnancy is achieved in 20% of embryo transfer cycles.

The average age of women giving birth after ART treatment was 33.6 years, 4.6 years older than the average age of all Australian mothers (29.0 years). Deliveries of ART babies tended to involve a higher incidence of caesarean section (46.7% of ART deliveries) and ART babies tended to have lower birthweights. Moreover, ART babies had a perinatal death rate of 20.7 deaths per 1,000 births, a rate 2.5 times that for all Australian births. These poorer outcomes are partly the result of the higher incidence of multiple pregnancies among ART mothers. For ART pregnancies in 2001, 20.8% were twin and 1% were triplet pregnancies. These proportions are markedly different from those in the general Australian population wherein only 1.6% of confinements were twin and 0.04% were triplet pregnancies (AIHW: Dean & Sullivan 2003).

Termination of pregnancy

At the national level, information on terminations of pregnancy is incomplete. However, there are some state estimates and the national Medicare data set may be of use, although Medicare Benefits Schedule items relating to termination of pregnancy can also be claimed for other reasons.

In 2001, Medicare fee-for-service benefits (MBS items 16525 and 35643) were paid for 76,332 terminations of pregnancy; this figure excludes services to public patients in hospital and through other publicly funded programs. In 2002, this number had decreased slightly, to 75,282 terminations (HIC 2003b).

Only South Australia and Western Australia collect population-based data on terminations. In 2001, South Australia reported 5,571 terminations at a rate of 17.6 per 1,000 women aged 15–44 years (Chan et al. 2002). Western Australia reported 8,368 terminations at a rate of 19.9 per 1,000 women aged 15–44 years.

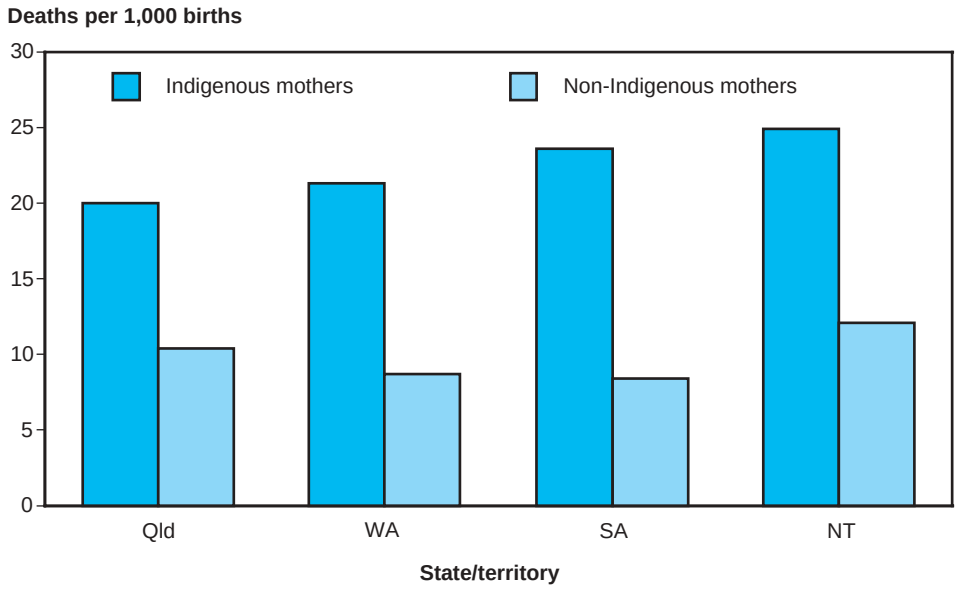
Indigenous mothers and their babies

In 2000, there were 8,779 babies born to Indigenous mothers, representing 3.4% of all Australian births. Of these, 13.5% were classified as low birthweight, twice the percentage for mothers overall.

Of births to Indigenous mothers, 20.3% were delivered by caesarean section, a slightly lower percentage than for all mothers. However, among Indigenous mothers aged

less than 20 years, 16.6% gave birth by caesarean section delivery compared with 13.5% of all teenage mothers.

Perinatal mortality data reported here are produced from data provided by all states and territories for the three-year period 1998–2000 (ABS & AIHW 2003). During that period, babies of Indigenous mothers were twice as likely to die at birth and during the early postnatal phase as babies born to other Australian mothers (Figure 4.2) 20.1 deaths per 1,000 births compared with 9.6. Although it is difficult to assess trends due to uncertainties about how completely women are identified as Indigenous in the perinatal collections, the overall perinatal mortality rate for this period is similar to that for 1996–1998.



Note: Perinatal deaths include foetal and neonatal deaths.

Source: ABS & AIHW 2003.

Figure 4.2: Perinatal death rates, selected states and territories, 1998–2000

Perinatal mortality

Perinatal deaths include stillbirths (foetal deaths) and deaths of infants within the first 28 days of life (neonatal deaths). In 2002, more than 40% of foetal deaths were not allocated a specific cause of death, since medical certifiers are often unwilling or unable to provide an accurate cause of death without the assistance of an autopsy (ABS 2003c). The main causes of foetal deaths are intra-uterine hypoxia (a respiratory condition) (15.0%); congenital malformations, deformations and chromosomal abnormalities, such as trisomy 21 (Down syndrome) (14.1%); and disorders related to length of gestation and foetal growth (9.8%) (ABS 2003c).

Overall, the perinatal death rate has declined markedly in the last decade, from 10.7 deaths per 1,000 births in 1992 to 8.0 in 2002 (ABS 2003c). Foetal deaths (4.9 per 1,000 births) accounted for 61.4% of perinatal deaths, and neonatal deaths (3.1 per 1,000 births) for 38.6%. The perinatal death rate for males (8.6 per 1,000 births) was higher than that for females (7.4 per 1,000 births).

Perinatal deaths were more likely to occur among babies born to younger mothers (less than 20 years) and older mothers (40 years and over). In 2002, the rate was 12.4 deaths per 1,000 births among women aged less than 20 years and 12.7 among women aged 40 years or over. In contrast, the rates among births to women aged 25–29 and 30–34 years were 7.3 and 6.5 deaths per 1,000 births respectively (ABS 2003c).

Maternal mortality

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

Between 1994 and 1996, there were 106 deaths, an increase from the previous three years when 84 deaths were reported. An additional 6 deaths during 1994–1996 were identified following the release of the *Report on Maternal Deaths in Australia, 1994–96* (AIHW & NHMRC 2001). The main causes of maternal death in 1994–1996 included pulmonary embolism, hypertension, amniotic fluid embolism, cardiovascular disease and injury. Of all maternal deaths, direct deaths accounted for 46% and indirect deaths for 20%.

To bring Australian reporting into line with international standards and facilitate international comparisons, the number of maternal deaths used to calculate the maternal mortality rate will no longer include incidental deaths. For 1994–1996, the number of direct and indirect deaths was 66, with an overall mortality rate of 9.1 deaths per 100,000 confinements. Table 4.2 shows maternal mortality deaths and rates for the 1991–1993 and 1994–1996 triennia.

Table 4.2: Maternal mortality

	Direct deaths	Indirect deaths	Incidental deaths	MMR[(a)] including incidental deaths	MMR[(a)] excluding incidental deaths
1991–1993	26	22	36	10.9	6.2
1994–1996	46	20	34	13.0	9.1

(a) Maternal mortality rate per 100,000 confinements.

Sources: NHMRC 1998; AIHW National Perinatal Statistics Unit maternal mortality database.

Incidental deaths accounted for 34% of total maternal deaths in 1994–1996. These deaths were due to factors unrelated to pregnancy such as motor vehicle accidents, suicides, homicides and unrelated cancers.

4.2 Children and young people

This section provides an overview of the health and wellbeing of Australia's children and young people. For more detailed information refer to the Australian Institute of Health and Welfare's reports *Australia's Children: Their Health and Wellbeing 2002* and *Australia's Young People: Their Health and Wellbeing 2003*. Children are defined as persons aged 0–14 years and young people as persons aged 12–24 years. The overlap in ages is intentional, and reflects the fact that the transition from childhood to adulthood is a gradual process and does not occur at the same age for all individuals.

Children

In June 2003, about 4.0 million Australians (21% of the total population) were children aged 0–14 years. Of these, 2.0 million were boys and 1.9 million were girls. Of the children aged 0–14 years, 5.8% (about 230,000 children) were born in an overseas country. The Aboriginal and Torres Strait Islander child population in Australia in 2001 was about 179,000, comprising 4.5% of the total Australian child population (ABS 2003a).

Most Australian children enjoy good health, as indicated by increasing life expectancy at birth, and low and declining perinatal, infant and childhood deaths. Australian children grow up in a generally secure environment and have access to a quality education system, giving them a good start in life. However, there are children who are less fortunate than the majority. Children from families with lower socioeconomic status or an Indigenous background are exposed to a greater number of health risk factors, and have a higher risk of disease, injury and death than other Australian children.

Health status

The health status of Australian children is generally good. However, some Australian children are affected by chronic health conditions such as Type 1 diabetes and asthma. The latest available national data on the incidence of Type 1 diabetes in children come from the National Diabetes Register (a register of people with diabetes who use insulin). In 2001, the incidence of Type 1 diabetes in children was estimated to be 20.6 new cases per 100,000 children (AIHW 2003d). This was an increase of 10% from 18.7 new cases per 100,000 children in 2000 (AIHW 2001). While there are no national data in Australia, Type 2 diabetes, which is usually seen only in adults, is increasingly being reported in children in the United Kingdom, United States and other countries (Ehtisham et al. 2001; Brosnan et al. 2001).

Recent surveys show that 14 to 16% of children have a diagnosis of asthma that remains a current problem (Australian Centre for Asthma Monitoring 2003). Asthma was the most prevalent health condition reported for children aged 0–4 years (8%) and 5–14 years (16%) in the 2001 National Health Survey. The proportion of boys aged 0–14 years with asthma was higher than for girls of the same age range (15% compared with 12%). There was an increase in the proportion of children with asthma in the 1980s and early 1990s, although it is not clear whether there has been any change since that time (Australian Centre for Asthma Monitoring 2003).

The prevalence of mental health and behavioural problems among children aged 4–12 years is also of concern, and is estimated to be around 14%. The prevalence of attention-deficit hyperactivity disorder (ADHD) and depressive and conduct disorders is consistently higher for boys aged 6–12 than for girls of the same age. About 1 in 5 boys (19.3%) were identified to have ADHD compared with a prevalence of 8.8% among girls. The prevalence of depressive disorder and conduct disorder among boys was 3.7% and 4.8% respectively. The corresponding prevalence for the same disorders in girls was 2.1% and 1.9% (Sawyer et al. 2000).

Risk and protective factors for children

Children's health is influenced by a complex mix of risk and protective factors. Understanding the effect of these factors in children is particularly important because intervention early in life will usually have a better chance of success, and may even be essential for some factors.

Childhood risk and protective factors include physiological, familial, social and physical factors, as well as access to health and welfare services. Risk factors for poor health, particularly in the years before school, can include features related to the social and family environment such as parental mental illness, harsh parenting, abuse, neglect and family conflict; low socioeconomic status; and poor links with the community and social isolation. Biological and behavioural risk factors that influence health include low birthweight; lack of breastfeeding; the combination of physical inactivity and inappropriate nutrition leading to overweight and obesity; lack of protection from the sun; and not being fully vaccinated (Centre for Community Child Health 2000).

The health status of Australian children has generally improved over the last decade. For example, the proportion of children vaccinated against major preventable childhood diseases has increased, largely as a result of recent strategies and policies. Data from the Australian Childhood Immunisation Register indicate that the proportion of children aged 1 year who have been fully immunised increased from 74.9% in 1996 to 91.7% in 2003. The rate of full immunisation among children aged 2 years increased from 63.8% in 1996 to 89.3% in 2003 (HIC 2003a; AIHW 2002b).

According to the Australian Bureau of Statistics (ABS) 2001 National Health Survey, the majority of Australian children (91%) used some form of sun protection when in the sun. Sun protection has also been enforced at schools by a 'no-hat, no-play' policy.

Despite these successes, there are areas of concern, such as overweight and obesity among children (Magarey et al. 2001; Booth et al. 2001, 2003). Independent surveys conducted in three Australian states (New South Wales, Victoria and South Australia) indicate that in the period from 1985 to 1997, the prevalence of overweight among children increased by 60–70% and the prevalence of obesity trebled (Booth et al. 2003). There are health implications of obesity both in and beyond childhood. Overweight and obesity in children can lead to a number of conditions including high blood pressure, Type 2 diabetes, musculoskeletal discomfort, obstructive sleep apnoea, heat intolerance, asthma and shortness of breath (Eckersley 2001; Must et al. 1999). In addition, children's social and psychological wellbeing is affected by being overweight and obese (Strauss 2000).

Hospitalisations

The total number of hospitalisations in 2001–02 for Australian children aged 0–14 years was 550,076, comprising 8.6% of all hospitalisations. More boys (58%) than girls were hospitalised and a quarter (25%) of child hospitalisations were of infants. The most common reason for hospitalisations for the age groups 0–4 and 5–9 was for a respiratory condition, and for 10–14-year-olds it was for injury and poisoning (Table 4.3).

Table 4.3: Number and percentage of most common causes of hospitalisations for children aged 0–14 years, Australia, 2001–02

	Number			Percentage		
	0–4 years	5–9 years	10–14 years	0–4 years	5–9 years	10–14 years
Respiratory conditions	66,463	24,556	11,804	20.9	19.4	11.2
Injury and poisoning	22,985	21,490	23,352	7.2	17.0	22.1
Digestive conditions	20,158	16,582	15,148	6.3	13.1	14.3
Perinatal conditions	49,043	44	61	15.4	0.0	0.1
Infectious and parasitic diseases	30,328	7,932	4,143	9.5	6.3	3.9
Diseases of the ear and eye	21,639	12,969	3,877	6.8	10.3	3.7
Other conditions[(a)]	107,338	42,913	47,251	33.8	33.9	44.7
Total	**317,954**	**126,486**	**105,636**	**100.0**	**100.0**	**100.0**

(a) Other conditions include 'contact with health services' (which includes circumcision and treatments such as dialysis and chemotherapy); symptoms, signs and abnormal findings; congenital malformations; diseases of the nervous, genitourinary, endocrine and circulatory systems; mental disorders; skin, musculoskeletal and blood diseases; pregnancy and childbirth-related complications; and cancer.

Source: AIHW National Hospital Morbidity Database.

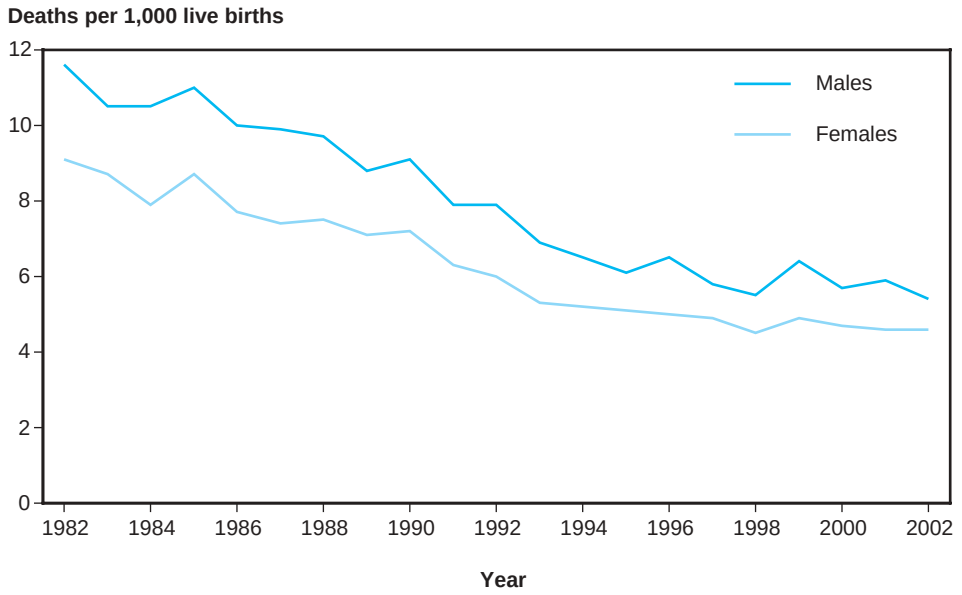
Mortality

Mortality among Australian children is low and declining. Australia's infant mortality rate has almost halved over the past two decades, and there has also been a steady decline in mortality among children aged 1–14 years.

In 2002, 1,882 Australian children aged 0–14 years died, accounting for 1.4% of all deaths in that year, while children comprise 21% of the total population. Most of these child deaths occurred among infants—67% of child deaths in 2002 were of children aged less than 1 year.

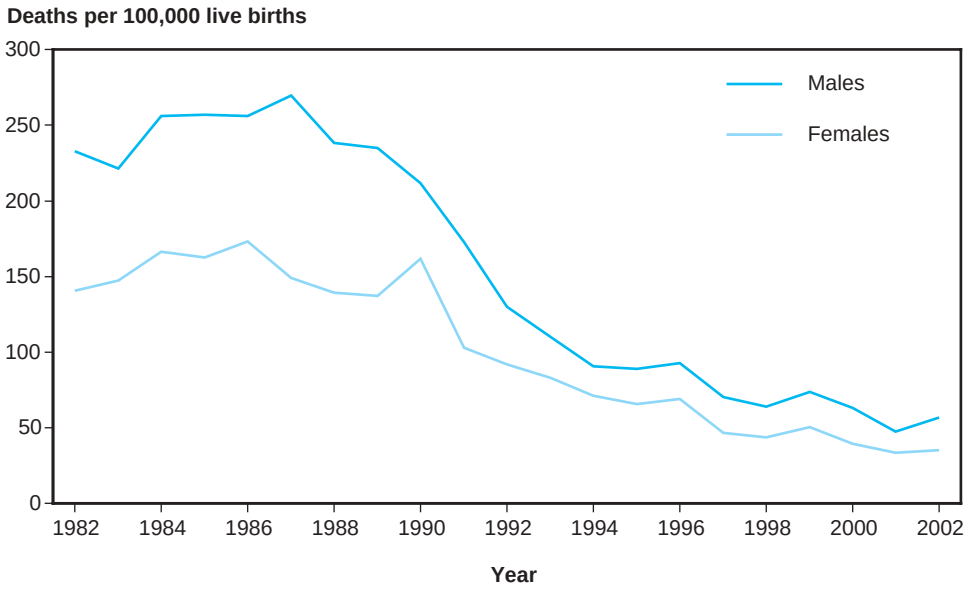
Infant mortality rates are higher among boys than girls for almost all leading causes of death. Between 1982 and 2002, the infant mortality rate for boys was, on average, 27% higher than that for girls (Figure 4.3). Major causes of infant deaths in Australia in 2002 were conditions originating in the perinatal period (52% of total infant deaths), congenital malformations (22%) and sudden infant death syndrome (SIDS) (9%).

A major contributor to the recent fall in post-neonatal mortality (aged over one month and under one year) has been the decline in deaths from SIDS. Although a relatively uncommon event, SIDS remains the single most important cause of post-neonatal infant death in Australia. However, following the 1991 introduction of the National SIDS Council of Australia's public education campaign on the sleeping position of infants, which advised that babies should be placed on their back or on their side in such a way that they cannot roll onto their stomach, the death rate from SIDS has decreased dramatically (Figure 4.4). In 2002, the SIDS death rate was 46 deaths per 100,000 live births, compared with 180 in 1982—a fall of 74%, with most of the decline occurring during the early 1990s.



Source: AIHW National Mortality Database.

Figure 4.3: Infant death rates, 1982 to 2002

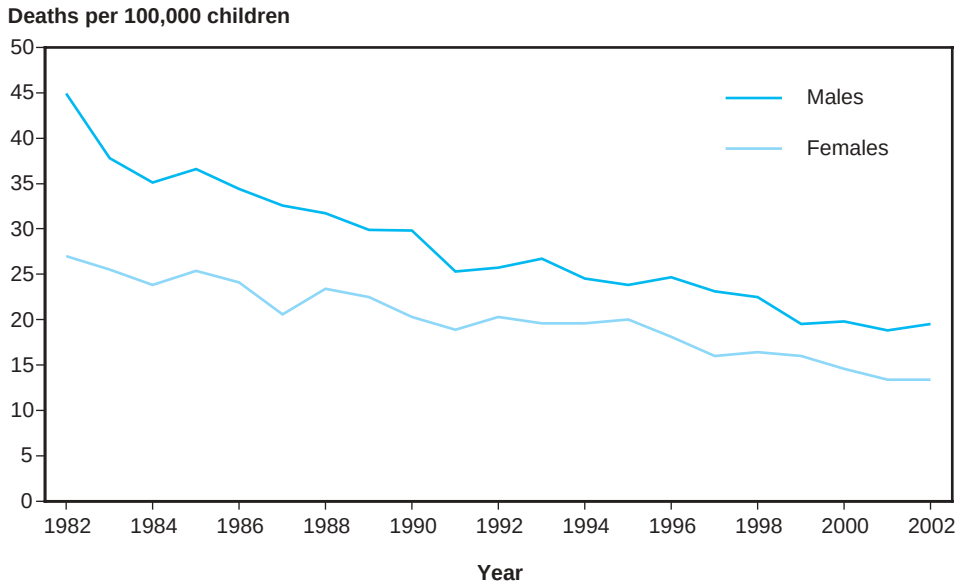


Source: AIHW National Mortality Database.

Figure 4.4: Death rates from SIDS for infants under 1 year, 1982 to 2002

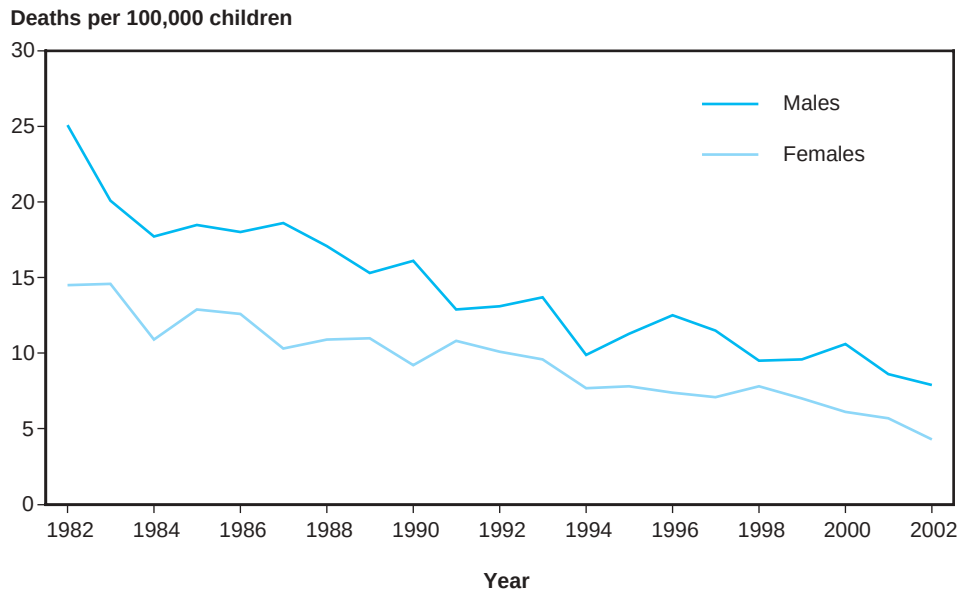
Although Australia compares well internationally in its life expectancy and overall death rates, its infant mortality rates are not so favourable. In 2001, Australia's infant mortality rate of 5.2 deaths per 1,000 births ranked sixteenth among 30 OECD countries (OECD 2003). The lowest infant mortality was recorded in Iceland with a rate of 2.7 deaths per 1,000 live births. Infant mortality in Australia is influenced by high death rates among Indigenous infants. In 2001, the Indigenous infant mortality rate was 10.6 deaths per 1,000 live births, a rate that was 2.2 times that of the non-Indigenous infants.

In the last two decades there has also been a large decline in mortality among children aged 1–14 years. Between 1982 and 2002, the mortality rate declined by 51% for boys, from 39.6 to 19.5 deaths per 100,000 boys, and by 50% for girls, from 26.8 to 13.4 deaths per 100,000 girls (Figure 4.5). Injury remains the leading cause of death among children aged 1–14 years (229 deaths, or 6.1 deaths per 100,000 children in 2002). Death from injury was higher for boys (7.9 deaths per 100,000 children) than for girls (4.3 deaths per 100,000 children) (Figure 4.6). The main causes of injury among children were accidental drowning, pedestrian accidents, accidental suffocation and transport accidents. Child deaths due to motor vehicle accidents declined from 3.7 deaths per 100,000 children in 1991 to 2.0 deaths per 100,000 children in 2002. Similarly, the death rate for accidental drowning declined from 2.1 in 1991 to 1.4 deaths per 100,000 children in 2002. Other common causes of deaths in this age group are neoplasms including cancer (118 deaths in 2002, or 3.2 deaths per 100,000 children), diseases of the nervous system including cerebral palsy and epilepsy (61 deaths, or 1.6 deaths per 100,000), and congenital malformations (45 deaths, or 1.2 deaths per 100,000 children).



Source: AIHW National Mortality Database.

Figure 4.5: Death rates for children aged 1–14 years, 1982 to 2002



Source: AIHW National Mortality Database.

Figure 4.6: Injury death rates for children aged 1–14 years, 1982 to 2002

Health differentials

The health of children may be influenced by a number of factors associated with socioeconomic status, such as household income and place of residence. Children from lower socioeconomic backgrounds tend to have poorer health status than those from higher socioeconomic backgrounds (Stanley 2003; Rutter 2003). Indigenous children are at a higher risk of disease, injury and mortality than other Australian children. In 2002, for example, Indigenous mortality among children aged 0–14 years was still 2.7 times that of non-Indigenous children. Children living in remote areas tend to have higher death rates, probably reflecting the larger proportion of Indigenous people in those areas. People living in remote areas are disadvantaged with regard to educational and employment opportunities, income, access to goods and services, and in some areas to clean water and fresh food (AIHW 2003e).

Young people

In June 2003 there were 3.6 million young people aged 12–24 years in Australia, about 18% of the total population. This proportion has been decreasing over the last few decades and in 2003 was the lowest ever observed. The decrease reflects the decline in fertility that began in the 1970s.

There were about 116,700 Indigenous Australians aged 12–24 years in 2001, representing around 3% of the total number of young people in Australia. These Indigenous young people make up a significant proportion (25%) of the Aboriginal and Torres Strait Islander population.

Approximately 16% of all young people resident in Australia were born overseas. Nearly 70% of Australia's young people aged 15–24 years lived in major cities in 2003, another 19% lived in inner regional areas and around 12% lived in outer regional and remote areas of Australia.

Health status

Young people in Australia generally enjoy a level of health that is good and has improved in recent times, as indicated by levels of mortality, morbidity and disability. Further, most young people in Australia rate their own health favourably. In 2001, approximately 65% of young Australians rated their health as either 'excellent' or 'very good' while a further 26% rated their health as 'good'. Similar proportions of young people aged 15–24 years in 1995 perceived their health status to be 'excellent', 'very good' or 'good'. Only 9% reported their health to be either 'fair' or 'poor' in both surveys.

The proportion of young people with disability is low compared with older people. In 1998, approximately 232,000 young persons (9%) aged 15–24 years had a disability—10% of males and 8% of females. Of those with a disability, 22% had a severe or profound core activity restriction.

While the health status of young Australians is generally good, there are areas where health gains need to be made. In the 2001 National Health Survey, 66% of males aged 15–24 years and 76% of females reported having a long-term health condition—a condition that has lasted, or is expected to last, for six months or more. The most prevalent conditions they reported were hay fever and allergic rhinitis, short-sightedness, asthma, and back pain and neck problems.

Mental health problems, including drug dependence disorders, are the major burden of disease for this age group. Of people aged 13–17 years, 13.4% of males and 12.8% of females were diagnosed with a mental health problem (Sawyer et al. 2000). In 1997, the prevalence of a mental disorder among those aged 18–24 years was 27% (ABS 1998). Alcohol abuse and motor vehicle accidents also add to the burden of disease for young people.

Risk and protective factors for young people

Youth is a period of rapid emotional, physical and intellectual change. As young people progress from childhood to adolescence and young adulthood, a number of risk factors affect their health and wellbeing. Motor vehicle accidents, suicide, mental health and behavioural problems, pregnancy and substance misuse pose risks to many young people. In addition, a number of the risk and protective factors that exist for children are also faced by young people, including obesity, physical activity and sun protection.

Physical activity is an important factor in reducing the risk of chronic disease. According to the 2001 Household Income and Labour Dynamics in Australia survey, a sizeable proportion of young Australians participate in physical activity. Of the young people aged 15–24 years, 48% of males and 31% of females undertook exercise more than three times a week. This was higher among those aged 15–17 years than those aged 18–24 years (46% compared with 36%). Approximately 60% of young

people undertook exercise three or fewer times per week (52% of males, 69% of females). The survey shows that young people aged 18–24 years exercised less than those aged 15–17 years.

Based on self-reported height and weight, 8% of males and 11% of females aged 15–17 years were classified as overweight or obese in 2001. Of those aged 18–24 years, 16% of males and 25% of females were classified as overweight or obese. In an assessment of their own weight, 28% of males and 9% of females whose self-reported height and weight placed them in the overweight category thought their weight was acceptable. In addition, 13% of females and 1% of males whose height and weight placed them in the underweight category reported their weight was acceptable.

In 2001, 85% of young people aged 12–17 years had taken some form of sun protection measure in the previous month—a slight increase from the 1995 figure of 83%. Of those aged 12–14 years, 88% used any form of sun protection measure in 2001. Over 50% of young people aged 12–24 years reported that they regularly checked their skin for changes in freckles and moles or had it checked by a doctor. This proportion increased from 53% in 1995 to 57% in 2001.

Tobacco use is a risk factor associated with respiratory problems and immediate loss of physical fitness and, in the longer term, a number of adult cancers as well as cardiovascular and respiratory diseases. Data from the 2001 National Drug Strategy Household Survey showed that, among those aged 14–17 years, 82% had never smoked, 15% were recent smokers and 3% were ex-smokers. Among 18–24-year-olds, 34% of males and 30% of females were recent smokers. The ABS 2001 National Health Survey reported that 36% of males and 27% of females aged 18–24 years were current smokers.

Alcohol use by young people can also be detrimental to their health and community. Consequences of youth alcohol use may include unwanted and unsafe sex, violence, crime, road and traffic accidents, self-harm and death (NDARC 2003; Lynskey 2001). In 2001, 31% of males and 25% of females aged 14–19 years drank alcohol at least weekly. These proportions rose to 55% and 39% for males and females aged 20–29 years. In the 12 months before the 2001 National Drug Strategy Household Survey, 7% of persons aged 14–17 years drank alcohol in a way considered risky or a high risk to health in the long term (AIHW 2002a).

Young people experience a greater risk of developing harmful drug use and experiencing drug-related harm. Data from the 2001 National Drug Strategy Household Survey indicated that 28% of young people aged 14–17 years had used an illicit drug at least once in their lives. In 2001, 21% of young people aged 14–17 years indicated that they had used cannabis in the last 12 months, 4% used amphetamines, 4% pain-killers for non-medical use, 3% ecstasy, 0.5% injecting drugs and 6% other illicit drugs.

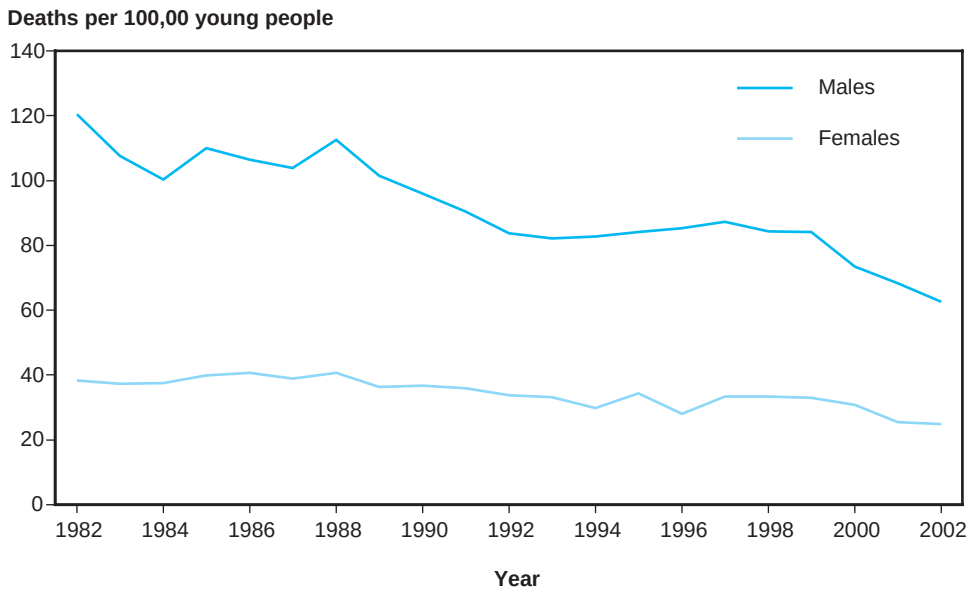
Hospitalisations

In 2001–02, there were 546,124 hospitalisations for young Australians aged 12–24 years, accounting for 8.5% of the total hospitalisations in that period. The single most common reason for hospitalisation for both male and female young persons was for impacted teeth. Hospital admissions were higher for young females aged 12–24 (60% in 2001–02)

than for young males (40%) of the same age. This was due to hospitalisations for pregnancy and childbirth which accounted for 32% of the hospitalisations of females aged 12–24 years. For males, the main cause of hospitalisation was injury, which contributed 27% of their total hospitalisations.

Mortality

There were 1,564 deaths of young people aged 12–24 years in 2002 in Australia, representing 1% of deaths among all ages in that year. Of these, nearly 75% of the deaths were of young males. The death rate for young males declined by 48% from 120.4 deaths per 100,000 in 1982 to 62.8 deaths per 100,000 in 2002. For females aged 12–24 years the death rate declined by 35% from 38.4 per 100,000 to 25.0 per 100,000 (Figure 4.7).



Source: AIHW National Mortality Database.

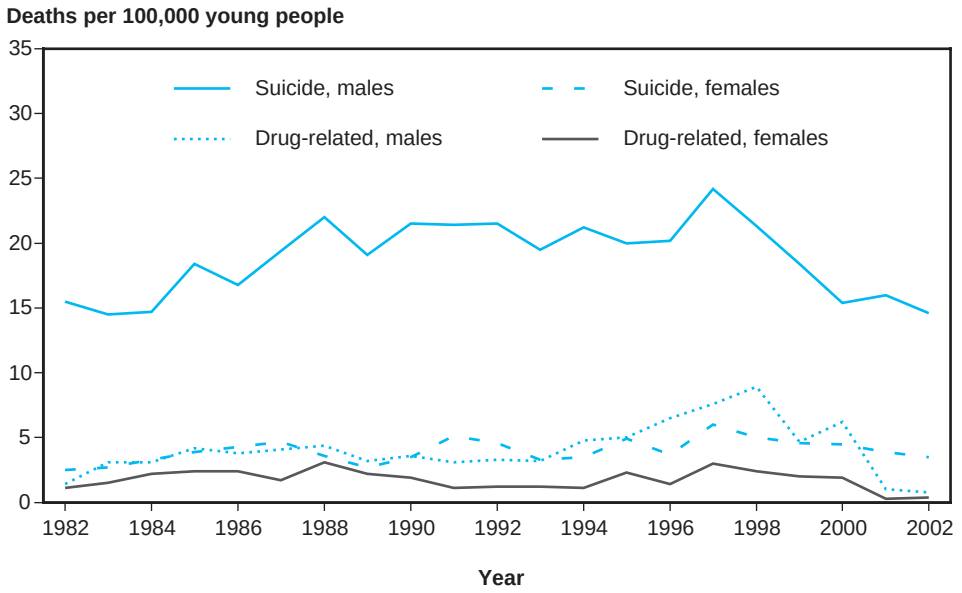
Figure 4.7: Death rates for young people aged 12–24 years, 1982 to 2002

In 2002, the mortality rate for young people was highest among males aged 18–24 years at 91 deaths per 100,000, largely as a result of the high rate of suicide. Males aged 15–17 years followed at 45 deaths per 100,000. Between 1982 and 2002, mortality among young people declined continuously, with the greatest falls occurring in the 12–14-year age group for males and the 15–17-year age group for females.

In 2002, over 70% of the total deaths of young people was due to injury and poisoning, including transport accidents and suicide. Deaths from transport accidents as a specific cause were responsible for 36% of all deaths of young people (517 deaths, 394 males and 123 females). Deaths from suicide as a specific cause were responsible for 21% of all deaths (324 deaths, 264 males and 60 females). Deaths from cancer followed at 9% of all deaths of young people, and diseases of the nervous system a further 5%. For young

people aged 15–17 years, the most frequent causes of death were suicide and motor vehicle accidents as passengers, drivers or pedestrians. The major causes of death for those aged 18–24 years were suicide, car driver and passenger accidents, and accidental poisoning by drugs.

Drug-related death rates fluctuated between 1982 and 2002, with a noticeable peak in deaths in 1998, and lower rates in 2001 and 2002. Over this period, rates ranged from 1 to 9 deaths per 100,000 males, and for females from 1 to 3 deaths per 100,000 (Figure 4.8).



Source: AIHW National Mortality Database.

Figure 4.8: Suicide and drug-related death rates among young people aged 12–24 years, 1982 to 2002

4.3 Overseas-born people

Australia is an ethnically diverse nation. The 2001 ABS estimated resident population shows that about 23% of Australian residents were born overseas and more than half of these were born in a non-English-speaking country.

Health requirements for immigration ensure that migrants generally enjoy good health, if not better health, than the Australian-born population. This is known as the 'healthy migrant effect'. Immigrants often have lower death rates and hospitalisation rates, as well as lower rates of disability and prevalence of certain lifestyle-related risk factors (AIHW: Singh & de Looper 2002). However, as length of residence in Australia increases, the relative advantage that migrants have over Australian-born people tends to decrease (Young 1992). This 'equalising' effect may become more evident in the next decade as many of the young migrants of the 1950s and 1960s are now reaching ages at which they are at greater risk of a range of chronic conditions.

Some migrant groups continue to face special problems in dealing with the Australian health care system. Development of culturally appropriate models of preventive health care is one of the most effective ways to overcome access and equity concerns about the health of overseas-born people (DHFS & AIHW 1998).

For purposes of health comparison, immigrants may be grouped into four broad regional groups—the United Kingdom and Ireland, Other Europe, Asia and Other (Box 4.1). It is recognised that these groups are broad and ethnically diverse, and that comparisons at this level provide only general trends. For meaningful comparisons, the analysis that follows has used age-standardisation to adjust for different age structures in the groups.

Box 4.1: Country of birth categories

Other countries are classified according to the Standard Australian Classification of Countries and are grouped here into four birthplace groups:

United Kingdom and Ireland: Over one-quarter of all Australians born overseas were born in these countries.

Other Europe: Continental Europe including Western Europe, Northern Europe, and Southern and Eastern Europe.

Asia: South-East, North-East and Southern and Central Asia.

Other: North Africa and the Middle East, Sub-Saharan Africa, the Americas, New Zealand and the Pacific Region. New Zealand is the largest source, constituting over one-third of this group.

Mortality and morbidity

Mortality (death) differences are measured here by expressing the age-standardised mortality rate of those born overseas as a ratio of the rate of those born in Australia—a statistic known as a standardised mortality rate ratio. Table 4.4 shows these mortality rate ratios for the period 1999–2001 for the four overseas-born groups according to the range of major disease categories and injury, and for all causes combined. The all-cause ratios are below 1 for both males and females in all four overseas birthplace categories. Mortality rates among migrants from the United Kingdom and Ireland are closest to the rates for Australian-born people. In comparison, migrants from Asia have much lower standardised mortality ratios, with mortality rates 35% lower among males and 20% lower among females than their Australian-born counterparts. Interpretation of these variations needs to bear in mind the average length of time each group has been in Australia, as mentioned above.

Mortality by cause of death shows significant variation between overseas-born population groups. Table 4.4 shows that all migrant groups have lower levels of cardiovascular mortality compared with the Australian-born population. Analysis of data from the ABS National Health Survey for 2001 indicates that Australian-born persons have a higher prevalence of overweight and obesity than their overseas-born

counterparts, this being an important risk factor for the development of a number of health problems including cardiovascular disease (AIHW: O'Brien & Webbie 2003). However, despite having lower levels of mortality, migrants from the United Kingdom and Ireland, and Other Europe are more likely to report cardiovascular disease as a long-term condition than are Australian-born persons (ABS 2002b). Also, although they tend to report lower body weight than their Australian-born counterparts, persons born in Southern and Eastern Europe, North Africa and the Middle East report lower levels of physical activity as well. Persons born in Asia also report lower levels of exercise (ABS 2002b).

Table 4.4: Standardised mortality ratios[(a)] by birthplace, persons aged 15 years and over, 1999–2001

Selected causes of death	Males					Females				
	Deaths	UK & Ireland	Other Europe	Asia	Other	Deaths	UK & Ireland	Other Europe	Asia	Other
Infectious	2,596	*0.84	1.04	*1.42	*1.28	2,328	1.01	*1.20	*1.53	*1.11
Cancers	61,954	1.00	*0.91	*0.63	*0.80	47,773	*1.06	*0.90	*0.74	*0.90
Colorectal	7,653	*0.83	*0.87	*0.48	*0.68	6,380	*0.80	*0.81	*0.59	*0.64
Lung	13,884	*1.23	*1.10	*0.66	*0.91	6,835	*1.48	*0.69	*0.82	*0.82
Melanoma	2,721	*0.42	*0.28	*0.11	*0.59	1,450	*0.55	*0.40	*0.10	*0.57
Prostate	7,873	*0.85	*0.62	*0.39	*0.63	. .	. .	. .	. .	. .
Breast	. .	. .	. .	. .	. .	7,601	*1.13	*0.91	*0.63	1.04
Cervix	. .	. .	. .	. .	. .	749	1.06	0.90	*1.48	*1.73
Diabetes	4,718	*0.85	*1.26	1.17	*1.18	4,313	*0.83	*1.56	*1.43	*1.37
Circulatory	72,182	*0.91	*0.90	*0.65	*0.91	78,134	*0.92	*0.87	*0.66	*0.96
Ischaemic	42,823	*0.93	*0.89	*0.61	*0.90	37,541	*0.94	*0.89	*0.60	0.95
Stroke	14,659	*0.86	*0.91	*0.82	0.94	22,053	*0.90	*0.82	*0.75	0.95
Respiratory	16,944	0.98	*0.70	*0.57	*0.82	14,202	*1.09	*1.20	*0.54	*0.80
Digestive	6,210	0.97	*0.88	*0.57	*0.85	6,241	1.05	*0.80	*0.65	*0.72
External	16,831	*0.92	*0.88	*0.56	*0.92	7,504	0.95	1.03	*0.74	0.96
Transport	4,395	*0.78	0.90	*0.65	0.97	1,635	0.98	1.03	0.97	0.90
Suicide	5,797	0.95	*0.84	*0.35	*0.85	1,512	*0.81	1.25	*0.69	1.06
Assault	588	0.97	0.92	1.15	1.14	318	0.91	1.29	1.21	0.86
All causes[(b)]	**197,444**	***0.94**	***0.89**	***0.65**	***0.87**	**181,536**	***0.98**	***0.87**	***0.69**	***0.92**

* Statistically significantly different from 1.00 at the 5% level.

. . Not applicable.

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

(b) Includes 'other' causes of death.

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

Source: AIHW National Mortality Database.

Deaths from cancers also show variation across birthplace groups. Death rates from lung cancer for both males and females born in the United Kingdom and Ireland, and for males born in Other Europe, were higher than for their Australian-born counterparts. Females born in the United Kingdom and Ireland had higher death rates for breast cancer. Cervical cancer mortality rates among women born in Asia and Other countries were higher than among Australian-born women generally. However, Australian-born males had higher mortality rates for prostate cancer than all other birthplace groups. Immigrants from all other regions have much lower mortality rates for melanoma compared with Australian-born persons, which may reflect variations in skin colour and exposure to sun early in life. Smoking, diet, alcohol consumption and use of health care services such as screening programs all play a role in these differences related to cancer risk (Wheeler & Selby 1993).

Mortality rates for diabetes are higher for those born in Other Europe, Asia and Other countries relative to the Australian-born population. Proportionally more overseas-born people than Australian-born also report having diabetes; approximately 35% of people of all ages who reported having diabetes in 2001 were born overseas, whereas they comprise 23% of the population (AIHW: Holdenson et al. 2003). In particular, diabetes incidence, hospitalisation and mortality are more common among people born in the South Pacific Islands, Southern Europe, the Middle East and North Africa, and Southern Asia.

Table 4.5 presents hospitalisation statistics for a range of diagnoses, as an indication of the relative morbidity of overseas-born and Australian-born residents. Hospitalisation rates for 2001–02 for overseas-born people generally reflect the corresponding mortality patterns, and indicate lower morbidity for both males and females compared with Australian-born people.

Asian-born migrants had the lowest hospitalisation rates, although persons born in this region exhibited higher hospitalisation rates for a number of specific diagnoses. Hospitalisation for cancer of the cervix among females born in Asia and Other countries is higher than for Australian-born females. Women born in these regions also report lower rates of regular Pap smear testing (ABS 2002b). Hospitalisation rates for tuberculosis and cataract removal are also higher.

Hospitalisation for gastritis and duodenitis among persons born in Other Europe, Asia and Other countries, as well as for calculus of the kidney and ureter among persons born in Other Europe and Other countries was higher than for Australian-born persons—these diseases may reflect specific dietary patterns. On the other hand, persons born overseas were less likely to be hospitalised for a number of mental disorders, such as schizophrenia, depressive episodes and sleep disorders.

Another notable difference was for skin cancer, where the hospitalisation rate for the overseas-born population was less than half that of the Australian-born. In particular, Asian-born males and females had less than one-tenth of the skin cancer hospitalisation rate of their Australian-born counterparts.

Table 4.5: Standardised hospitalisation ratios[(a)] by birthplace, persons aged 15 years and over, 2001–02

	Males					Females				
Principal diagnosis	**Seps**	**UK & Ireland**	**Other Europe**	**Asia**	**Other**	**Seps**	**UK & Ireland**	**Other Europe**	**Asia**	**Other**
Tuberculosis	447	0.82	1.15	*18.10	*3.89	504	0.68	1.37	*19.65	*5.68
Colorectal cancer	13,936	*0.73	*0.84	*0.49	*0.82	11,062	*0.67	*0.78	*0.62	*0.74
Lung cancer	11,213	1.03	1.05	*0.76	*0.89	6,096	1.04	*0.55	*0.59	0.89
Skin cancer	45,369	*0.44	*0.21	*0.09	*0.39	31,615	*0.46	*0.25	*0.06	*0.41
Breast cancer	. .	. .	. .	. .	. .	21,036	0.98	*0.75	*0.62	*0.90
Cervical cancer	. .	. .	. .	. .	. .	1,798	*0.72	*0.61	*1.26	*1.39
Prostate cancer	15,109	*0.71	*0.63	*0.48	*0.74	. .	. .	. .	. .	. .
Diabetes mellitus	27,799	*0.74	*1.06	0.95	0.99	23,233	*0.78	*1.07	*1.25	*1.08
Schizophrenia	17,992	*0.47	*0.69	*0.46	*0.75	9,731	*0.40	*0.88	*0.54	*0.53
Depressive episode	17,570	*0.76	*0.56	*0.22	*0.57	28,080	*0.82	*0.54	*0.25	*0.52
Sleep disorders	21,280	*0.57	*0.62	*0.58	*0.66	6,827	*0.62	*0.65	*0.42	*0.68
Cataract	51,650	*0.75	*0.80	*1.19	0.96	77,366	*0.78	*0.80	*1.36	0.99
Angina pectoris	54,053	*0.79	*0.84	*0.62	1.04	32,970	*0.84	*0.88	*0.68	*1.07
Acute myocardial infarction	26,211	*0.78	*0.91	*0.72	1.03	14,120	*0.86	0.96	*0.66	0.96
Pneumonia	22,877	*0.74	*0.85	*0.51	*0.84	20,086	*0.76	*0.76	*0.63	*0.93
Asthma	5,242	*0.60	*0.49	*0.56	1.10	11,278	*0.75	*0.46	*0.51	1.00
Gastritis & duodenitis	20,947	*0.76	*1.41	*1.39	*1.10	26,352	*0.81	*1.53	*1.42	*1.28
Inguinal hernia	34,989	*0.91	0.98	*0.50	1.03	2,918	*0.74	*1.18	*0.31	0.93
Calculus of kidney & ureter	18,156	*0.83	*1.28	*0.82	*1.30	7,116	*0.83	*1.67	0.99	*1.28
Single spontaneous delivery	. .	. .	. .	. .	. .	33,379	*0.65	*0.73	*0.67	*1.21
Care involving dialysis	366,622	*0.58	*1.33	*1.43	*1.40	267,577	*0.51	*0.98	*1.32	*1.35
Chemotherapy session for neoplasm	107,541	*0.84	*0.95	*0.54	*0.69	120,387	*0.93	*0.80	*0.57	*0.82
All diagnoses[(b)]	**2,654,402**	***0.76**	***0.85**	***0.66**	***0.88**	**3,193,560**	***0.81**	***0.83**	***0.70**	***0.93**

* Statistically significantly different from 1.00 at the 5% level.

. . Not applicable.

Seps Hospital separations.

(a) The standardised hospitalisation ratio is a relative measure of hospital use between the overseas-born and Australian-born populations. If the ratio were 1.00 this means the overseas-born would have the same hospitalisation rate as the Australian-born. Ratios greater than 1.00 indicate a relatively greater level of hospitalisation in the overseas-born population, and those below 1.00 indicate a relatively lower hospitalisation rate.

(b) Includes other causes of hospitalisation.

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

Source: AIHW National Hospital Morbidity Database.

4.4 Aboriginal and Torres Strait Islander peoples

Aboriginal and Torres Strait Islander people suffer a much greater burden of ill health than other Australians. Indigenous people are more likely to experience disability and reduced quality of life due to ill health, and die at younger ages (ABS & AIHW 2003). The Indigenous population is disadvantaged across a range of socioeconomic factors that have an impact on health.

In 2001, Aboriginal and Torres Strait Islander people reported lower incomes than other Australians, higher rates of unemployment, poorer education outcomes and lower rates of home ownership (ABS 2003e). However, socioeconomic status alone does not explain all the variations in health status that exist between Indigenous and non-Indigenous Australians. Higher levels of health risk behaviours (such as smoking and alcohol misuse) and other risk factors (such as poor housing and exposure to violence) among the Indigenous population are also important determinants of their health. Research also suggests that a range of other factors may contribute and partially explain adverse Indigenous health outcomes: the social environment, including the immediate local or neighbourhood environment; social connections with friends, family and the community; and the extent of control and perceptions of mastery in the workplace and wider society (Trudgen 2000).

Data quality

There is clear evidence from different sources to indicate that Indigenous Australians have generally poorer health than other Australians. However, it is not possible to report whether Indigenous health is improving or not. This is partly due to incomplete identification of Indigenous people in the Census and administrative records, and partly to the statistical and practical challenges of surveying a small population that has a relatively high 'remote area' component. A greater effort to identify Indigenous Australians in a range of surveys and administrative data sets is a key strategy that will provide better quality information about their health in the future (ATSIHWIU 1997).

The coverage of Indigenous people in birth and death registration is improving, but deaths registrations data are not yet of a high enough quality in all states and territories to provide national estimates. Data from Queensland, Western Australia, South Australia and the Northern Territory, where registrations are of reasonable quality, are used to provide indicative information.

Information from hospitals and general practitioners (GPs) may provide a broad indication of the burden of chronic conditions and acute illnesses in Indigenous people compared with the non-Indigenous population. At present, there is no national data source that records conditions treated by primary health care providers such as Aboriginal health workers or nurses. Other sources of data that can be used to identify Indigenous people include the Aboriginal Medical Services, Health Insurance Commission Medicare data, disease registers and national household surveys with supplementary Aboriginal and Torres Strait Islander samples. Such data sources provide better information on specific diseases, risk factors and living conditions. Indigenous identification and the quality of Indigenous data have been improving through efforts at all levels.

The Indigenous population

The Indigenous population in 2001 was estimated to be 458,520, comprising 2.4% of the total Australian population. Approximately 10% of Indigenous people were of Torres Strait Islander origin. More than half of all Indigenous people live in New South Wales and Queensland. New South Wales has the greatest number of Indigenous people (134,888) and the Northern Territory has the highest proportion, approximately 29% of all residents. The majority of Indigenous people live in major cities and inner and outer regional areas, but 27% live in remote or very remote areas, compared with 2% of the non-Indigenous population.

The Indigenous population is considerably younger than the non-Indigenous population. In 2001, the median age for Indigenous people was 20.5 years, compared with a median age of 36 years for the non-Indigenous population. Fertility is higher for the Aboriginal and Torres Strait Islander population, and Indigenous women give birth at younger ages than non-Indigenous women. In 1998–2000, 79% of Indigenous mothers had babies before the age of 30 compared with 52% for non-Indigenous mothers.

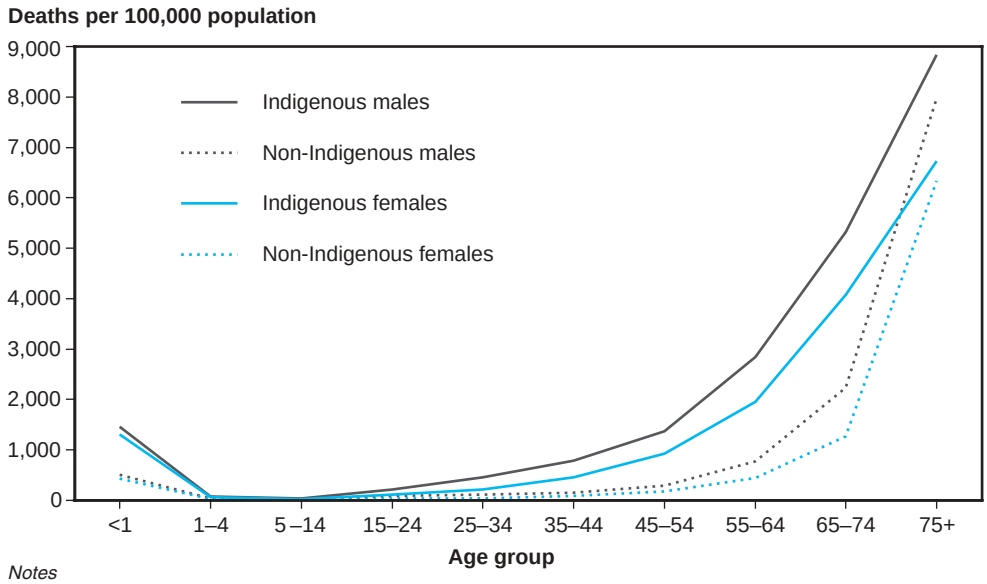
The estimated life expectancy at birth for Aboriginal and Torres Strait Islander people is much lower than for other Australians. For the period 1999–2001, the life expectancy at birth was estimated to be 56 years for Indigenous males and 63 years for Indigenous females—similar to life expectancy for the Australian male population in 1901–1910, and the Australian female population in 1920–1922 (ABS 2000). In contrast, the life expectancy at birth for all Australians in 1999–01 was 77 years for males and 82 years for females.

Measures of health status

Mortality

In the four jurisdictions where mortality data are of adequate coverage—Queensland, Western Australia, South Australia and the Northern Territory—the 2000–2002 age-standardised mortality ratio for Indigenous deaths compared with non-Indigenous deaths was 2.9 for males and 2.6 for females (Table 4.6). Age-specific death rates for Aboriginal and Torres Strait Islander people were higher than the non-Indigenous rates in every age group (Figure 4.9). The largest relative differences in age-specific death rates occurred for ages 35–44 years, where Indigenous rates were more than five times as high as the non-Indigenous rates. There were also substantial differences between the 25–34, 45–54 and 55–64-year age groups, where the Indigenous age-specific death rates were three to four times as high as the non-Indigenous rates.

Indigenous people had death rates in excess of the non-Indigenous population for almost all causes of deaths. In 2000–2001, deaths from diseases of the circulatory system, injury and poisoning (mainly accidents, self-harm and assault), neoplasms (cancers), respiratory diseases and endocrine or metabolic diseases (mainly diabetes) accounted for the greatest numbers of deaths among Indigenous people (Table 4.6). These were also the leading causes of death among the non-Indigenous population, accounting for about 86% of all deaths.



Notes

1. Data are for Qld, WA, SA and NT only.
2. There is a certain proportion of deaths for which Indigenous status is not stated. Since it is unknown what proportion of these is likely to be Indigenous, they have been excluded from the calculation of rates.

Source: AIHW National Mortality Database.

Figure 4.9: Age-specific death rates among Indigenous and non-Indigenous males and females, 2000–2002

Table 4.6: Deaths from selected causes, Indigenous Australians, 2000–2002

	Males		Females	
Cause of death[(a)]	**Number[(b)]**	**SMR[(c)]**	**Number[(b)]**	**SMR[(c)]**
Diseases of the circulatory (cardiovascular) system	664	3.0	510	2.2
Injury and poisoning	524	3.0	230	2.9
Neoplasms (including cancers)	356	1.3	314	1.6
Respiratory system diseases	228	3.9	170	3.6
Endocrine, nutritional and metabolic diseases	193	7.3	250	10.1
Digestive system diseases	118	4.6	90	3.4
Mental and behavioural disorders	79	3.6	37	1.0
Infectious and parasitic diseases	64	5.3	53	5.4
Nervous system diseases	67	2.7	44	1.6
Genitourinary system diseases	48	4.6	90	7.5
Symptoms, signs and abnormal findings	76	6.0	47	4.8
All causes	**2,557**	**2.9**	**1,978**	**2.6**

(a) ICD-10 codes used are I00–I99, V01–Y98, C00–D48, J00–J99, E00–E90, K00–K93, F00–F99, A00–B99, G00–G99, N00–N99, R00–R99.

(b) Data are for Indigenous deaths for usual residents of Queensland, South Australia, Western Australia and Northern Territory combined, based on year of registration.

(c) SMR is the standardised mortality rate. It is the observed deaths divided by expected deaths, with the latter based on total Australian age, sex and cause-specific rates.

Source: AIHW National Mortality Database.

Between 1998 and 2000, babies born to Indigenous mothers were twice as likely to die at birth or during the early postnatal period as babies born to non-Indigenous mothers (Figure 4.10) (ABS & AIHW 2003). While it is difficult to assess trends because of uncertainties about the extent to which women are identified as Indigenous in the perinatal data collections, the Indigenous infant mortality rate for this period is unchanged from that for 1996–1998.

Note: Perinatal deaths include foetal and neonatal deaths.

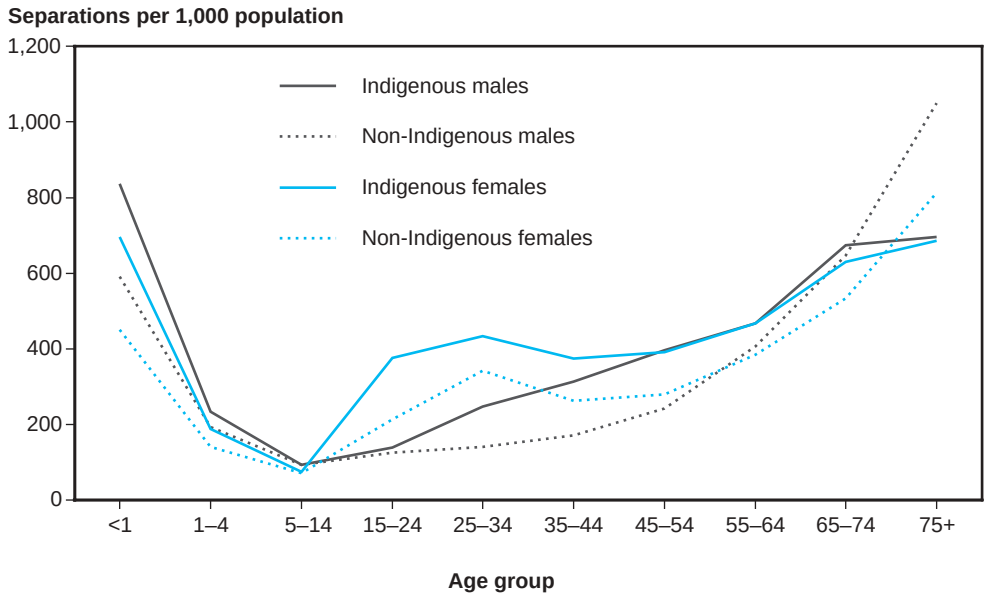
Source: AIHW National Perinatal Statistics Unit perinatal data collection.

Figure 4.10: Perinatal death rates, selected states and territories, 1998–2000

Common diseases and problems

In 2001–02, Indigenous people in every age group were more likely than other Australians to be hospitalised for most diseases and conditions, indicating a higher occurrence of acute illness (Figure 4.11). Apart from hospitalisation for dialysis, which is the most common treatment in hospital for Indigenous people, the main reasons for Indigenous males to be hospitalised were injuries and poisoning (18% of all hospital stays), respiratory disease (14%), digestive diseases (9%), and mental and behavioural disorders (8%). For Indigenous females—excluding hospitalisations for pregnancy and childbirth—the most common reasons for hospitalisation were injury and poisoning (13%), respiratory diseases (13%) and digestive system diseases (10%).

Over the five-year period 1998–2003, 1.1% of GP encounters were identified as involving Indigenous patients, suggesting under-identification (AIHW: Britt et al. 2003). The six individual problems most frequently managed by GPs for Indigenous patients were diabetes, high blood pressure, upper respiratory tract infection, asthma, acute bronchitis and depression.



Note: There is a certain proportion of hospitalisations for which Indigenous status is not stated. Because it is unknown what proportion of these is likely to be Indigenous, they have been excluded from the calculation of rates.

Source: AIHW National Hospital Morbidity Database.

Figure 4.11: Hospital separation rates, all causes excluding dialysis, 2001–02

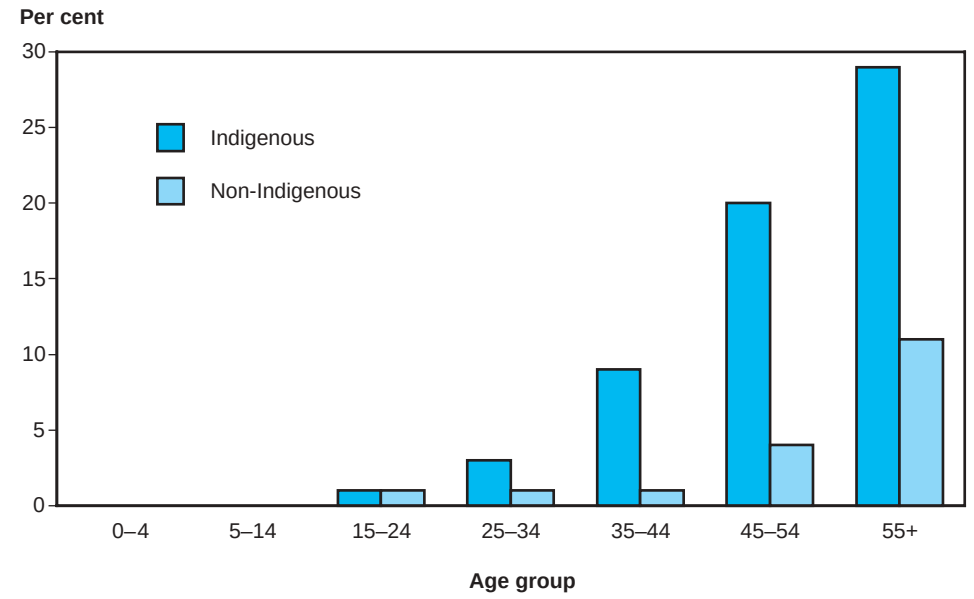
Kidney disease is significantly more prevalent among Indigenous people than among non-Indigenous people. In 2001, 6.2% of the persons registered with the Australian and New Zealand Dialysis Transplant Registry identified as Indigenous and 66% of these were aged less than 55 years. Of the 1,883 new cases starting treatment for end-stage renal disease in 2001, 9% were Indigenous. Indigenous patients were younger than non-Indigenous patients and more Indigenous females than males began treatment (ABS & AIHW 2003).

'Care involving dialysis', haemodialysis for kidney disease, was the most common procedure for Indigenous people in Australian hospitals in 2001–02. The rate for haemodialysis procedures among Indigenous males and females was 8 and 15 times as high as for non-Indigenous males and females respectively. In 2000–2002, the death rate from chronic kidney disease for Indigenous Australians was seven times as high as the rate for non-Indigenous Australians.

Diabetes is also a significant health problem for Aboriginal and Torres Strait Islander people. Type 1 diabetes (early onset and insulin-dependent) is relatively rare in the Indigenous population, but there is a very high prevalence of Type 2 diabetes (usually later onset).

Indigenous people who have Type 2 diabetes often develop the disease earlier than other Australians and often die at younger ages. In 2001, the age-standardised prevalence of self-reported diabetes among Indigenous people was 11%, compared to 3% among the

non-Indigenous population (Figure 4.12). In 2001–02, the hospitalisation rate for Type 2 diabetes among Indigenous people aged between 25 and 54 years was 15–18 times the rate for non-Indigenous people.



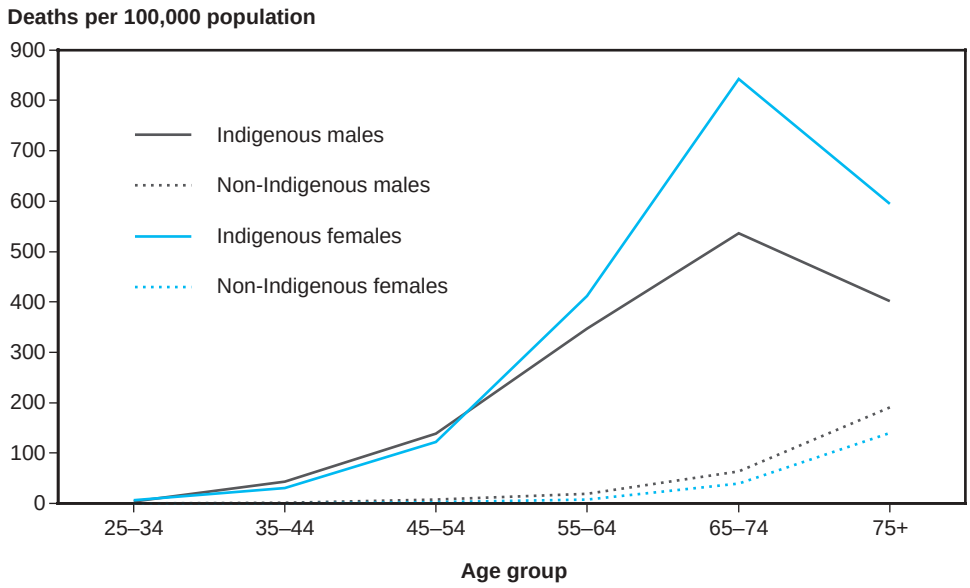
Source: ABS 2002b.

Figure 4.12: Self-reported diabetes, 2001

The death rate associated with diabetes provides an indication of the burden of the disease in the Indigenous population. Diabetes has an earlier onset in the Indigenous population. Age-specific death rates for 2000–2002 show that, from age 25 years onwards, the death rate for diabetes in the Indigenous population was dramatically higher than in the non-Indigenous population (Figure 4.13). The death rate for Indigenous people aged 35–44 and 45–54 years was 27–35 times that of the non-Indigenous population. The earlier onset of Type 2 diabetes among Indigenous people has serious implications for diabetic complications (O'Dea 1992). Largely through lack of knowledge, Indigenous people are less likely to adopt the lifestyle changes required for optimal self-management of the disease (McCulloch et al. 2003; King 2001).

Mental health

At present, there are no national data about the incidence or prevalence of mental disorders among Aboriginal and Torres Strait Islander people. Data on hospitalisation and mortality due to serious mental disorders and illnesses are currently the main sources. It has been proposed that the forthcoming 2004–05 National Aboriginal and Torres Strait Islander Health Survey include a module to assess various aspects of the social and emotional wellbeing of Aboriginal and Torres Strait Islander people.



Note: There is a certain proportion of hospitalisations for which Indigenous status is not stated. Because it is unknown what proportion of these is likely to be Indigenous, they have been excluded from the calculation of rates.

Source: AIHW National Mortality Database.

Figure 4.13: Diabetes age-specific death rates, 1999–2001

In 2001–02, Aboriginal and Torres Strait Islander people were hospitalised for conditions classified as 'mental and behavioural disorders' at a higher rate than the general population. The rate of hospitalisation for Indigenous people diagnosed with mental disorders due to psychoactive substance use was four to five times the rate for the non-Indigenous population (ABS & AIHW 2003). The death rate associated with mental disorders among Indigenous males was over three times the rate for non-Indigenous males, but for females the rate was the same as for non-Indigenous females (Table 4.6). The majority of these deaths in the Indigenous population (74%) were attributed to mental disorders due to psychoactive substance use.

Death rates from suicide for Indigenous males and females are over twice the rate for non-Indigenous males and almost twice the rate for non-Indigenous females. The age-specific death rate from suicide for Indigenous males was highest in the 25–34-year age group at 83 deaths per 100,000, compared with 24 deaths per 100,000 for males in the same age group in the general population. For Indigenous males in the 15–24-year age group, deaths by suicide occurred at a rate of 54 deaths per 100,000, compared with 15 deaths per 100,000 for non-Indigenous males in the same age group. For Indigenous females, the rate was highest in the 15–24-year age group at 20 per 100,000, compared with 3 per 100,000 for non-Indigenous females.

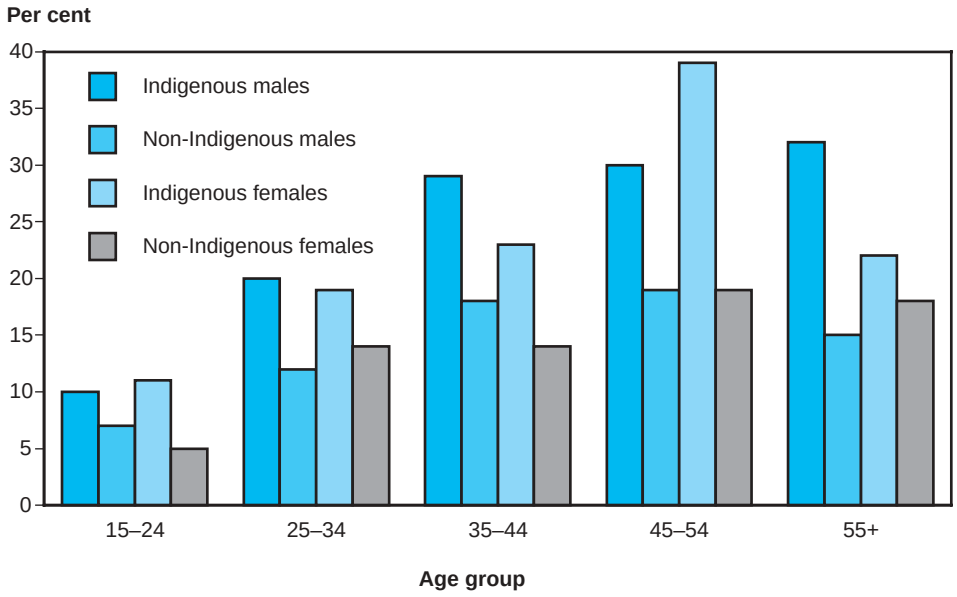
Health risk factors

Low birthweight

In the period 1998–2000, babies of Indigenous mothers were nearly twice as likely as babies of non-Indigenous mothers to be of low birthweight (that is, to be less than 2,500 grams at birth). Low birthweight may be a result of premature birth, foetal growth retardation or a combination of the two (Alberman 1994). Factors influencing a baby's birthweight include socioeconomic disadvantage, the size and age of the mother, the number of babies previously born, the mother's nutritional status, smoking and other risk behaviours, illness during pregnancy and the duration of pregnancy. Low birthweight babies are more prone to ill health during childhood, and may be more vulnerable to some illnesses, such as kidney disease, in adulthood (Alberman 1994; Barker & Clark 1997).

Obesity

There is a greater level of obesity among Aboriginal and Torres Strait Islander adults than in the non-Indigenous population. Self-reported results from the 2001 National Health Survey indicate that Indigenous males and females in each age group were more likely to be obese than non-Indigenous Australians of the same age group (Figure 4.14). The high level of obesity puts the Indigenous population at greater risk of kidney disease, Type 2 diabetes, cardiovascular diseases and other chronic conditions. The type and quantity of food consumed and the level of physical activity influence body weight.



Source: ABS 2002b.

Figure 4.14: Prevalence of self-reported obesity, 2001

Poor nutrition

Many Aboriginal and Torres Strait Islander people do not have the opportunity for a healthy diet, which is essential for good health. In particular, Indigenous people who live in remote areas do not have the same opportunities as people living in metropolitan and regional centres to obtain affordable, healthy food. Even in areas where healthy food is available, factors such as competing priorities for limited family incomes, restricted access to traditional foods, lack of knowledge of the nutritional value of certain foods and lack of culturally appropriate information on healthy food can lead to inadequate nutrition (Public Health Services, Queensland Health 2001).

The diet of many Aboriginal and Torres Strait Islander people has changed from a fibre-rich, high-protein, low saturated fat 'traditional' diet to one which is high in refined carbohydrates and saturated fats. The most recent results (ABS 2001 National Health Survey) indicate that less than half of Indigenous adults living in non-remote areas have a medium to high level of fruit intake (42% of Indigenous adults have two or more serves of fruit per day, compared with 52% of non-Indigenous adults).

Smoking, alcohol and other drug use

Data from the 2001 National Drug Strategy Household Survey show that there is a high prevalence of smoking among Aboriginal and Torres Strait Islander people. The daily smoking rate for Indigenous people aged 14 years and over was over twice that for non-Indigenous adults (45% compared with 19%), placing them at an increased risk for the diseases and conditions described above.

Several surveys have shown that Indigenous people are less likely than non-Indigenous people to drink alcohol, but that those who do drink are more likely to consume it at hazardous levels (ABS & AIHW 2003). The hazardous use of alcohol is related to conditions such as alcohol-dependence syndrome, alcoholic liver disease, high blood pressure, stroke and some cancers (Anderson 1996). Alcohol is frequently a contributing factor in injuries, accidents, assault and self-harm (Unwin et al. 1994), and may contribute to social problems such as family breakdown, domestic violence, and financial and legal problems (Davis 1998).

The most recent national data on alcohol consumption among Indigenous people come from the 2001 National Health Survey. The survey found that in the week before the survey, over 29% of adult Indigenous drinkers were in the risky or high-risk category for alcohol consumption, compared with 17% of non-Indigenous drinkers. Indigenous female drinkers were less likely to be in the high-risk category than Indigenous males, but were still more likely than non-Indigenous women drinkers to be consuming alcohol at hazardous levels (ABS & AIHW 2003).

Indigenous people are also at risk of ill health through the use of illicit substances such as marijuana, heroin, amphetamines and inhalants (for example petrol, glue or aerosols). The most recent source of national data on the use of illicit drugs among Indigenous people is the 2001 National Drug Strategy Household Survey. Approximately 57% of Indigenous respondents in urban areas aged 14 years and older

reported having tried at least one illicit drug, and 32% were currently using an illicit drug. This compares with 37% of the general urban population who had ever used an illicit drug, and 17% who currently used an illicit drug.

There are no reliable national data on petrol sniffing, but case studies indicate that the practice continues to be a major problem in some Indigenous communities. Petrol sniffing causes confusion, aggression, lack of coordination, hallucinations, respiratory problems and chronic disability, including mental impairment (d'Abbs & MacLean 2000).

Housing and living conditions

Adequate housing is a major factor affecting health. Many Indigenous people live in housing conditions which are unacceptable by general Australian standards because they do not satisfy the basic requirements of shelter, safe drinking water and adequate sewerage provisions.

Overcrowded living conditions increase the risk of the spread of infectious diseases such as meningococcal disease, rheumatic fever, tuberculosis and respiratory infections. Indigenous people experience overcrowded living conditions more commonly than other Australians. Results from the 2001 Census showed that 15% of Indigenous households were living in dwellings that required at least one additional bedroom, compared with 4% of other households (ABS & AIHW 2003).

Results from the 1999 Australian Housing Survey indicated that people in Indigenous households in urban areas and major regional centres were almost three times as likely as people in non-Indigenous households to report their homes to be in need of repair (19% compared with 7%). A higher proportion of non-Indigenous households reported no need for repairs (44% compared with 34%). The 2001 Community Housing and Infrastructure Needs Survey (ABS 2002a) identified 21,287 permanent dwellings managed by Indigenous housing organisations. The majority of these dwellings (70%) were located in remote or very remote areas. Of these, 2,914 (19%) required major repairs and 1,461 (10%) required replacement (Table 4.7).

Table 4.7: Condition of permanent Indigenous dwellings, by area, 2001

	Minor or no repairs		Major repairs		Replacement		Total	
	Number	%	Number	%	Number	%	Number	%
Major cities	678	82.9	107	13.1	33	4.0	818	100
Inner regional	1,417	77.5	370	20.2	41	2.2	1,828	100
Outer regional	2,761	75.7	633	17.3	255	7.0	3,649	100
Remote	1,720	64.7	702	26.4	236	8.9	2,658	100
Very remote	8,414	68.2	2,212	17.9	1,225	9.9	12,334	100
Australia	**14,990**	**70.4**	**4,024**	**18.9**	**1,790**	**8.4**	**21,287**	**100**

Notes

1. All permanent dwellings managed by Indigenous community housing organisations.
2. The total includes dwelling condition not stated.

Source: ABS 2002a.

Inadequate and poorly maintained infrastructure affects many Indigenous communities, particularly those in remote and rural areas of Australia. It is recognised that improving basic environmental health conditions, such as access to clean water and adequate sanitation, are critical for better health among the Aboriginal and Torres Strait Islander people living in these communities.

Water is a basic necessity, and ready access to safe drinking water is an essential public health requirement. Regular water testing and treatment are necessary to ensure that water is free from hazardous micro-organisms.

While most Indigenous people live in cities and towns with a common water supply and sewerage systems that also serve the non-Indigenous population, approximately one-quarter of the Indigenous population (108,085) live in discrete Indigenous communities. Of these 89,861 live in communities not connected to a town supply (ABS 2002a).

Table 4.8: Water testing, communities not connected to a town water supply, 2001

	Indigenous communities with a population size of:			Total	
	50–99	100–199	200 or more	Community total	Reported usual population
Drinking water sent away for testing					
Failed testing	14	14	28	56	17,028
Did not fail testing	20	19	71	110	52,144
Total with drinking water sent away for testing[(a)]	34	34	101	169	70,542
Drinking water not sent away for testing	25	9	9	43	6,245
All communities[(b)]	**59**	**43**	**111**	**213**	**78,087**

(a) Includes 'whether drinking water failed testing' not stated.

(b) Includes 'whether drinking water sent away for testing' not stated.

Notes

1. In the 12 months before the survey.
2. Communities with a population of 50 or more.

Source: ABS & AIHW 2003.

The 2001 Community Housing and Infrastructure Needs Survey collected information on water treatment and testing from 213 (78,087 people) of the 216 Indigenous communities with a usual population of 50 or more which were not connected to a town water supply. One-fifth (43 communities, 6,245 people) had drinking water that had not been tested in the 12 months before the 2001 survey. Fifty-six communities (26%) with a population of 17,028 had drinking water that had failed testing at least once in the 12-month period.

Most discrete Indigenous communities had waste water and sewerage systems, but a high proportion reported problems with these systems, and a large number of communities reported unsafe ponding. Ponding occurs when large pools of stagnant water collect and remain for more than a week. It is commonly caused by overflow from

blocked drains and sewage overflows and leakage. It is a major health risk associated with the increased risk of vectorborne diseases (diseases spread by insects such as mosquitoes). In 2001, 137 communities (or 42% of communities with a usual population of 50 or more) reported ponding—for 46% of these communities ponding occurred more than five times in that year. Flooding also creates health-related problems. Flooding occurred in 31% of discrete Indigenous communities, affecting 3% of all permanent dwellings in communities of this size (ABS & AIHW 2003).

4.5 Socioeconomically disadvantaged people

Adverse social and economic circumstances can affect health throughout life. People who are poorer, or socially disadvantaged in other ways, live shorter lives and suffer more illness than those who are well off. This effect is not limited just to the extreme poor—a gradient in health is apparent across all levels of society. Even those at the middle levels of society exhibit poorer health than do the wealthy (Wilkinson & Marmot 2003).

Socioeconomic disadvantage can have many forms, including low income, poor education, unemployment, limited access to health services, living in poor housing and working in an unrewarding or menial job. Alone or in combination, and over time, these stressful economic and social circumstances have an effect on health and wellbeing.

Most forms of socioeconomic disadvantage can be measured and linked to adverse health outcomes, although their relative contribution and their interaction continue to be debated and researched (Turrell & Mathers 2000). Composite measures of socioeconomic status, often based on area of residence, have also been devised. The most commonly used measure by area of residence is the Socio-Economic Indexes for Areas, or SEIFA, derived by the ABS from population census data (ABS 2003d).

Risk factors

The relationship between socioeconomic disadvantage as a risk factor for ill health and its interaction with other health risk factors has already been discussed in Chapter 3. Results from the 2001 National Health Survey continue to show that persons from lower socioeconomic groups are more likely to smoke, exercise less, be obese, and have few or no usual daily serves of fruit (ABS 2002b; AIHW: O'Brien & Webbie 2003). These are variously risk factors for a number of major health conditions such as lung cancer, and cardiovascular and respiratory diseases (Table 4.9).

Major illnesses and health service use

Among the long-term health conditions covered in the 2001 National Health Survey, those reported more often by disadvantaged people included diabetes, diseases of the circulatory system, arthritis and diseases of the ear. The survey also found that the socioeconomically disadvantaged report greater use of doctors and hospital outpatient/casualty services, but are less likely to use preventive health services, such as breast cancer screening and Pap smear testing (Table 4.9).

Table 4.9: Proportion with selected health risk factors, long-term conditions and health actions by socioeconomic position, 2001 (per cent)

	Quintile of socioeconomic disadvantage	
	Most disadvantaged (1st quintile)	Least disadvantaged (5th quintile)
Selected health risk factors		
Current smoker	32.0	17.0
Risky/high alcohol use	10.3	11.8
Sedentary/low exercise level	73.9	64.5
Overweight/obese	46.0	43.1
Low/no usual intake of fruit	50.7	44.1
Selected long-term conditions		
Asthma	12.1	11.2
Diabetes	4.2	1.9
Diseases of the circulatory system	21.0	14.7
Arthritis	17.5	11.0
Diseases of the ear and mastoid	15.1	11.6
Selected actions		
Casualty, outpatients, day clinic visits	5.5	3.9
Doctor consultation	28.9	22.4
Private health insurance	30.3	71.2
Breast cancer screening	66.8	71.4
Pap smear test	47.0	59.4

Source: ABS 2002b.

Mortality and life expectancy

The relationship between mortality and socioeconomic disadvantage in Australia has been well documented. Draper et al. (in press) found that people with low socioeconomic status have higher rates of mortality for almost all causes of death, markedly higher in numerous cases. In 1998–2000, the all-cause mortality rate for males aged 25–64 years in the most disadvantaged population quintile (fifth) was 75% higher than the rate for males in the least disadvantaged quintile (377 compared to 215 deaths per 100,000 population). For females, the all-cause mortality rate in the most disadvantaged quintile was 52% higher (204 compared to 135 deaths per 100,000 population). The lung cancer mortality rate in the most disadvantaged quintile was 102% higher for males and 73% higher for females; for ischaemic (coronary) heart disease, 107% for males and 170% for females; for stroke, 93% for males and 84% for females; for diseases of the respiratory system, 181% for males and 143% for females; and for accidents and injury, 124% for males and 103% for females.

Life expectancy at birth during the same time period varied from 79.2 years for males in the least disadvantaged quintile to 75.3 years for males in the most disadvantaged quintile. For females, the corresponding figures were 83.6 and 81.6 years.

The ABS found that of the total years of potential life lost due to premature death in 1997–1999, 24% came from the most disadvantaged quintile of the population, whereas only 15% came from the least disadvantaged quintile (ABS 2001a).

4.6 Health of people in rural and remote areas

Just over one-third (34%) of Australians live in regional and remote areas (that is, outside cities with populations greater than 250,000 people). These people live in a range of environments: in large regional centres, in coastal settlements, in small inland towns, on farms and in so-called 'outback' Australia. Their common feature is that they live some distance from the major population centres. The following discussion about the health of people living in rural and remote areas uses the geographical terms Major Cities, Inner Regional, Outer Regional, Remote and Very Remote—see next section for more detail.

As a broad generalisation, those who live outside Major Cities tend to have higher levels of health risk factors and somewhat higher mortality rates than those in the cities. Statistics on mortality are given in some detail below but some observations may help explain the findings. First, compared with people in Major Cities, those living elsewhere are more likely to be smokers; to drink alcohol in hazardous quantities; to be overweight or obese; to be physically inactive (AIHW: Strong et al. 1998); to have lower levels of education; and to have poorer access to work, particularly skilled work (Garnaut et al. 2001). They also have less access to specialist medical services and a range of other health services (AIHW: Strong et al. 1998). In addition, numerous rural occupations (for example farming, forestry, fishing and mining) are physically risky, and travelling on country roads can be more dangerous because of factors such as higher speeds, fatigue and animals on the road (AIHW: Strong et al. 1998). A final feature is that Remote and Very Remote areas have substantial Indigenous populations, and Indigenous health is poor overall (ABS & AIHW 2003).

Despite these general patterns, there is considerable variation within each broad geographical area. Remoteness does not guarantee poorer health, just as living in a large population centre does not guarantee the opposite. For example, populations in some metropolitan fringe and inner-city areas have relatively poor health (Burnley 1994), and between 1993 and 1999 about half of all statistical local areas (SLAs) in Very Remote areas had lower death rates than the Major Cities (AIHW 2003e). However, of those SLAs that had higher rates, about half had rates that were at least twice as high as Major Cities. Similarly, the levels of some health-related factors (such as immunisation rates (NCIRS 2004)) also vary within broad geographic areas.

A major problem in understanding the health of people in regional and remote areas is the limited availability, representativeness and quality of data. Very few data sources are complete, accurate, regionally representative and unambiguous enough to allow meaningful comparisons between populations from different areas (AIHW 2003f). Also, because Indigenous Australians make up a substantial proportion of the population of rural and (particularly) remote areas, 'Indigenous' and 'rural/remote' issues can frequently be related. For example, overall rates of cervical cancer death tend to be higher in remote areas, but not in the non-Indigenous people who live there (AIHW 2003c; AIHW 2003e). The major challenge in this case is therefore one of Indigenous health, not the health of those living in remote areas as such. However, data sets that allow distinctions such as this are uncommon because the identification of Indigenous people is usually incomplete (ABS 2000).

Another difficulty in interpreting the data is that different patterns of service provision in city, regional and remote areas can lead to invalid comparisons of resource usage and access to services (AIHW 2003f). For example, rural areas make greater use than cities of

hospital emergency departments as a source of primary care services and of hospital beds as a source of aged care services. This factor complicates inter-regional comparisons of hospital usage, aged care and provision of primary health care.

Geography and populations

A number of geographical classifications have been developed so that areas can be compared statistically. The ABS Australian Standard Geographic Classification (ASGC) Remoteness Areas classification allocates a category of remoteness to areas based on an average of the road distance to the closest of five classes of service centre (ABS 2001b; AIHW 2004). Areas are classified as Major Cities, Inner Regional or Outer Regional (referred to here as 'regional' when taken together), or Remote and Very Remote ('remote' when taken together). The bulk (66%) of the Australian population lives in Major Cities, 31% in regional areas and 3% in remote areas. Indigenous people live mainly in Major Cities (30%) and regional areas (43%), with the remaining 27% living in remote areas where they comprise 24% of the population (45% in Very Remote areas) (Table 4.10).

Table 4.10: Distribution of the Indigenous and total populations within each ASGC Remoteness Area, 2001

	MC	IR	OR	R	VR	Australia
Indigenous						
% of population in the area	1	2	5	12	45	2
% of national Indigenous population	30	20	23	9	18	100
All Australians						
% of national population	66	21	10	2	1	100

Note: MC, IR, OR, IR, R and VR, represent the categories of Major Cities, Inner Regional, Outer Regional, Remote and Very Remote areas respectively.

Source: AIHW population database, based on SLA resident population estimates compiled by ABS.

Mortality

In regional areas during 1997–1999, death rates were, on average, 1.1 times those in Major Cities. In Very Remote areas, rates were 1.5 times as high as in Major Cities (AIHW 2003e).

These higher death rates correspond to about 3,303 more deaths annually outside Major Cities than expected if Major City death rates had applied. This comprises 2,757 more deaths than expected in regional areas annually, and 546 more in remote areas.

Table 4.11 shows the specific causes for these 'excess' deaths. Most were due to cardiovascular diseases (such as coronary heart disease) and injury (especially motor vehicle accidents and suicide). Chronic obstructive pulmonary disease, diabetes and some cancers (mainly prostate, colorectal and lung) also contributed. Many of these causes are potentially preventable.

When overall death rates for non-Indigenous people are compared across areas, they remain higher in regional areas than in Major Cities, but the picture in remote areas is less clear. However, death rates of older non-Indigenous people from Remote areas are frequently lower than those in Major Cities, possibly due to migration of the frail aged to less remote areas so they can have better access to services. When analysis is restricted to non-Indigenous people younger than 65 years of age, rates for Inner

Regional males and for regional females were 1.1 times those for Major Cities, while rates for Outer Regional and remote area males were 1.2 times those for Major Cities. Rates were elevated, but not significantly higher, for remote area females.

It is not possible to compare Indigenous death rates across areas because of uncertainty about the accuracy of Indigenous identification in each area (AIHW 2003e).

Table 4.11: Leading causes of 'excess' deaths in areas outside Major Cities, 1997–1999

Cause of death	Annual 'excess' deaths	Per cent of total 'excess'
Coronary (ischaemic) heart disease	755	23
'Other' cardiovascular diseases[(a)]	518	16
Chronic obstructive pulmonary disease	374	11
Motor vehicle accidents	368	11
Diabetes	191	6
Suicide	184	6
'Other' injuries[(b)]	214	6
Prostate cancer	131	4
Colorectal cancer	112	4
Lung cancer	52[(c)]	2[(c)]
All other causes	399	12
All causes	3,303	100

(a) Excludes stroke and rheumatic heart disease.

(b) 'Other' injuries include all injuries except motor vehicle accidents, suicide, homicide and accidental shooting.

(c) There were 52 additional deaths due to lung cancer overall (this was made up of 112 additional deaths of those younger than 70 years outside Major Cities and 60 fewer than expected for those who were 70 years and older). While it accounted for 2% of all additional deaths, lung cancer accounted for 6% of additional deaths of people younger than 65 years.

Source: AIHW National Mortality Database.

Selected causes of death

Four specific causes of death, selected for their importance, are described below (see Table 4.11).

Coronary (ischaemic) heart disease was responsible for 755 more deaths each year outside Major Cities than expected. Rates were 1.1 times as high in all areas outside Major Cities except Very Remote areas, where they were 1.3 times as high. For younger non-Indigenous people (aged 0–64 years), rates were 1.1, 1.2, 1.2 and 1.3 times as high in Inner Regional, Outer Regional, Remote and Very Remote areas respectively. Overall, there were 3.3 times as many deaths of Indigenous people as expected (9.3 times as many for 0–64-year-olds).

There were about 374 more deaths (mainly male) than expected outside Major Cities due to chronic obstructive pulmonary disease each year; overall rates in Inner Regional, Outer Regional, Remote and Very Remote areas were 1.2, 1.3, 1.3 and 1.9 times those in Major Cities, respectively. Death rates for non-Indigenous people aged 0–64 years were 1.3, 1.6, 1.8 and 2.8 times as high in the four areas outside Major Cities. Rates for Indigenous people were 3.4 times as high as expected (and 8.8 times as high for 0–64-year-olds).

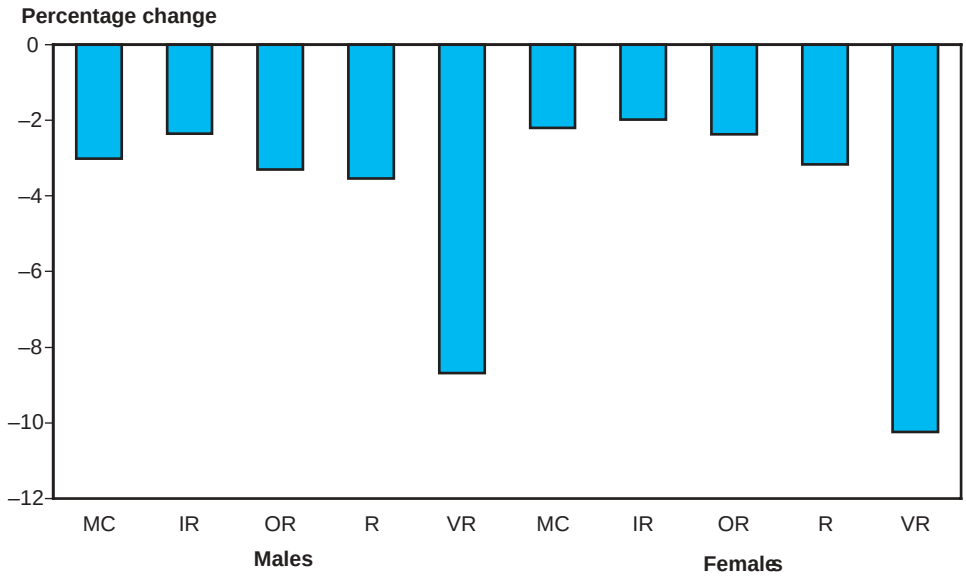
Outside Major Cities, there were 368 more deaths annually due to motor vehicle accidents than expected, of which 70% were deaths of males. Rates were substantially elevated outside Major Cities for all areas examined. In the four areas outside Major

Cities, rates for non-Indigenous people aged 0–64 years were 1.8, 2.0, 2.1 and 2.4 times as high. Indigenous death rates due to this cause were 4.1 times as high as expected.

There were 184 more deaths than expected due to suicide annually outside Major Cities, and practically all were of males. Rates in the four areas were 1.2, 1.2, 1.4 and 1.6 times the rate in Major Cities. Rates for non-Indigenous people were 1.2 times as high in Inner Regional, Outer Regional and Remote areas as in Major Cities, with all age groups between 15 and 64 years contributing, but similar in Very Remote areas to those in Major Cities. Rates for non-Indigenous people aged 0–64 years from Inner and Outer Regional areas were 1.3 and 1.2 times as high as in Major Cities. Indigenous death rates due to this cause were 2.9 times as high as expected.

Changes in death rates

Between 1992 and 1999, all-cause death rates declined in all areas, including cities, by between 2% and 3% each year, and in Very Remote areas they declined by 10% each year (Figure 4.15). Decreases have been driven mainly by reductions in a small number of diseases. Falls in cardiovascular disease death rates contributed to 45% of the decrease in remote areas, and 65–80% in the remainder; decreases in cancer death rates contributed 15% of the decrease overall; and lower respiratory disease death rates also contributed to the decrease, ranging from 10% of the decrease in Major Cities up to 25% in Very Remote areas). Apart from the changes in specific causes mentioned above, changes in the rate of death due to other causes contributed little in most areas, but 13% in Very Remote areas. Furthermore, injury death rates changed very little over the period.



Note: Expected deaths calculated using Major Cities rates in the period 1997–1999 as the standard.

Source: AIHW National Mortality Database.

Figure 4.15: Annual percentage change in the ratio of observed to expected deaths, 1992–1999

Hospital separations

Rates of hospital separation also differ across geographic areas. Compared to the rate of separation for residents of Major Cities (AIHW 2003a) in 2001–02:

- overall hospital separation rates were similar for residents of regional areas, but 1.2 and 1.4 times as high for those from Remote and Very Remote areas respectively;
- separation rates from private hospitals were lower (0.9 times in Inner Regional to 0.3 times in Very Remote areas);
- separation rates from public hospitals were higher (1.1 times in Inner Regional to 2.2 times as high in Very Remote areas respectively);
- same-day separation rates were 0.9 times as high (but similar in Very Remote areas); and
- overnight separation rates were 1.2 times as high in Inner Regional areas to 1.9 times as high in Very Remote areas respectively.

The higher overall separation rates for people living outside Major Cities may be due to greater need (poorer health) or to different admission practices. For example, admission in regional and remote areas may be more likely because of the greater need for precaution associated with greater distances and restricted access to other service types. The lower rates of admission to private hospitals probably reflects the lower levels of physical and financial access to these hospitals in regional and remote areas (most private hospitals are in the larger centres).

Rates of surgical procedure are likely to be affected by issues such as need and access, both physical and financial. Table 4.12 compares rates of separation of residents from regional and remote areas for selected procedures with those from Major Cities.

Table 4.12: Ratio of the separation rate for selected procedures, by ASGC Remoteness Area, 2001–02

Procedure	MC	IR	OR	R	VR
Appendicectomy	1.00	1.18*	1.21*	1.29*	1.06
Lens insertion	1.00	0.96*	1.07*	1.00	1.05
Knee replacement	1.00	1.22*	1.11*	1.10	0.71*
Caesarean section	1.00	1.11*	1.08*	1.14*	1.34*
Coronary artery bypass graft	1.00	0.99	0.92*	0.85*	0.70*
Coronary angioplasty	1.00	0.85*	0.81*	0.77*	0.58*

Note: The presented statistic is the ratio of the standardised prevalence ratio (SPR) for each area, divided by the SPR for Major Cities. In essence, a ratio greater than 1 indicates a higher rate of separation in the area compared to that in Major Cities; a ratio less than 1 indicates a lower rate of separation in the area compared to that in Major Cities. An asterisk indicates where rates of separation are significantly different from those in Major Cities.

Source: AIHW National Hospital Morbidity Database.

4.7 Health status of veterans

This section summarises health information on the servicemen and women who enlisted in the Australian Forces over the past century. At June 2003, an estimated 298,600 of the 1.5 million of these veterans were still alive. They served in conflicts from World War I (1914–1918) through to recent overseas missions.

Table 4.13: Number of veterans enlisted, and estimated survivors at 30 June 2003

	Numbers enlisted or engaged	Estimated survivors
World War I	416,809	7
World War II	1,118,000	208,900
Other pre-1972 conflicts	86,480	66,200
Post-1972 conflicts	n.a.	23,500
Total survivors	. .	**298,607**

n.a. Not available.

. . Not applicable.

Source: Department of Veterans' Affairs.

Health entitlements of the veteran population

Recognising the special contribution made to the nation by veterans, the Australian repatriation system provides a wide range of benefits to the ex-service community. Under the *Veterans' Entitlements Act (1986)*, the Department of Veterans' Affairs (DVA) provides eligible members of the veteran community with access to health care, assistance in the home and support services through arrangements with registered health care practitioners, home support agencies and providers, and public and private hospitals.

Eligible veterans, war widows or widowers and dependants are issued with cards that reflect their level of health care coverage (see Box 4.2).

Veterans aged 75–84, largely from World War II and the Korean conflict, represent the greatest proportion of gold and white card holders (53%). Those aged under 55 are the next largest group, comprising around 14% of veterans.

Box 4.2: Veterans' entitlement cards

Holders of a gold card (the Repatriation Health Card – For All Conditions) are entitled to the full range of health care services at DVA expense including medical, dental and optical care.

Holders of a white card (the Repatriation Health Card – For Specific Conditions) are entitled to the full range of health care services at DVA expense but generally only for those disabilities or illnesses accepted as service-related.

An orange card (Repatriation Pharmaceutical Benefits Card) was introduced on 1 January 2002 and provides pharmaceutical benefits under the Repatriation Pharmaceutical Benefits Scheme to British Commonwealth and Allied veterans who have World War II qualifying service, are aged 70 years or more and have lived in Australia for 10 years or more.

Table 4.14 shows the numbers of veterans in various age groups entitled to care, including dependent spouses and children but excluding persons who only hold an orange card.

Table 4.14: DVA health treatment population at 30 June 2003

	Age group									
	Under 55	55–59	60–64	65–69	70–74	75–79	80–84	85 & over	Unknown	All ages
Veterans										
Males	28,485	20,541	7,182	5,870	7,977	46,235	61,002	26,799	23	204,114
Females	2,090	72	59	35	61	3,023	3,688	1,528	6	10,562
Dependants										
Males	435	29	14	21	15	17	21	6	—	558
Females	1,862	1,345	1,947	3,949	14,014	33,571	32,960	22,130	30	111,808
Others[(a)]										
Persons	247	275	423	760	862	2,027	2,534	969	21	8,118
Total	**33,119**	**22,262**	**9,625**	**10,635**	**22,929**	**84,873**	**100,205**	**51,432**	**80**	**335,160**

(a) British, New Zealand, overseas, Commonwealth countries' forces and miscellaneous.

Note: The DVA health treatment population only includes gold and white card holders. There are 20,672 orange card holders, of whom 3,353 also hold a white card, and these white card holders are included above.

Source: Department of Veterans' Affairs.

Self-assessed health status

A recent study of veterans, war widows and widowers conducted in 2003 asked them to rate their own health on a five-point scale, ranging from 'very poor' to 'very good'. Results show that 47% rated their health as 'good' or 'very good' (42% of men and 54% of women), 36% as 'fair', 13% as 'poor' and 4% as 'very poor' (unpublished reports by AC Nielsen Research Pty Ltd and Newton Wayman Chong & Associates). These proportions are similar to those reported in a previous study conducted in 1997 (DVA 1998a).

However, only 39% considered there were things they could do to improve their health. Although 70% of those aged under 60 believed they could improve their health, only 27% of those aged 80 years and over had a similar view. In 2003, more respondents felt that there was nothing they could do to improve their health, compared with respondents in 1997 (61% versus 55%).

Prevalent medical conditions

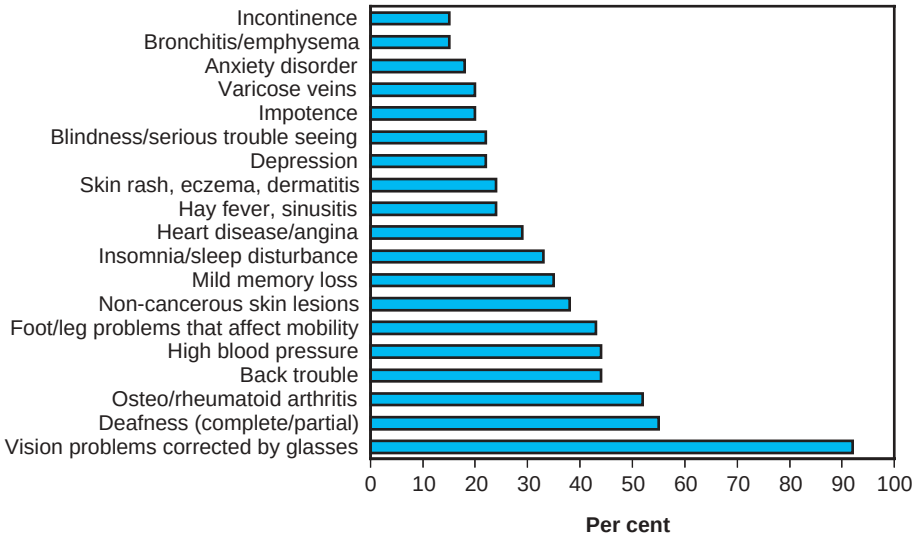
The most common self-reported medical condition in 2003, affecting over nine in ten veterans and war widows surveyed (92%), is vision problems corrected or alleviated by glasses or contact lenses (Figure 4.16). Complete or partial deafness and osteo/rheumatoid arthritis are also common, each affecting more than half of all veterans and war widows (55% and 52% respectively). Osteo/rheumatoid arthritis is more commonly found among females or those with a carer. Over two in five veterans and war widows are affected by back trouble such as sciatica or prolapsed discs (44%), high blood pressure (44%) or foot or leg problems that affect mobility (43%). There has

been a marked increase since 1997 in the proportion of veterans and war widows suffering from foot or leg problems that affect mobility (from 19% in 1997 to 43% in 2003).

The other main medical conditions that are now more prevalent include incontinence (up by 7% since 1997), vision problems corrected by glasses or contact lenses, deafness and high blood pressure (each having increased by 6%).

Veterans who served in Vietnam are more likely than other veterans to report suffering from mild memory loss; insomnia or sleep disturbance; skin rash, eczema or dermatitis; anxiety disorder; post-traumatic stress disorder; or an alcohol or drug problem.

Just over one in 10 veterans and war widows (12%) has a carer. The prevalence of having a carer has increased slightly since 1997 when it was 10%. Of these carers, 67% reported that they currently suffer from at least one of the following conditions: insomnia or sleep disturbance (49%); anxiety disorder (30%); depression (26%); or mild memory loss (25%).



Source: Department of Veterans' Affairs.

Figure 4.16: Most prevalent medical conditions in veterans and war widows and widowers, 2003

Comparative health status

In an analysis of population-based surveys, 49% of the veterans with a DVA health care entitlement card rated their health as either fair or poor, compared with about 33% of other males of equivalent age in the general community (Covance & DVA 1999). It was also found that veterans report poorer health and more health problems than people of the same age in the general community, and war widows and widowers.

The self-reported overall health status of war widows is similar to other females of the same age in the community, with about one-third rating their health as either fair or

poor. However, compared with the general community, veterans and war widows and widowers are more likely to report:

- having a recent illness
- having recently taken a health-related action
- having recently consulted with doctors and other health professionals
- undertaking some level of exercise.

Compared with males in the general community, entitled veterans are more likely to report the following illnesses:

- diseases of the respiratory, circulatory, digestive and musculoskeletal systems, and of the connective tissues
- arthritis
- mental disorders
- neoplasms.

Compared with females in the general community, war widows are more likely to experience and be treated for the following illnesses:

- diseases of the respiratory system
- mental disorders.

Male and female service pensioners and war widow pensioners have a higher average number of long-term conditions than age pensioners (Covance & DVA 1999).

Although analyses such as these examined a range of health conditions which may or may not be related to military service, some conditions have been officially accepted as being caused by a person's defence service. The ten most frequent of these conditions accepted under this arrangement (covering 63% of all such conditions) in 2000–01 were sensory-neural hearing loss, post-traumatic stress disorder, chronic bronchitis and emphysema, solar keratosis, ischaemic (coronary) heart disease, tinnitus, acquired cataract, non-melanoma skin cancer, osteoarthritis, and alcohol dependence or alcohol abuse.

Mortality patterns in veterans

A study of veterans' deaths between 1993 and 1997 concluded that their death rates differed substantially from the rest of the community (Covance 2000). The study found that, on average, male gold card holders had a death rate around 14% higher than the community death rate (Table 4.15). In contrast, male white card holders had death rates around 7% below the community rate. Similarly, war widows and widowers tended to have slightly lower death rates than the general community.

Death rates also differed substantially between disability pension levels. Veterans on the Extreme Disability Allowance, for example, have a death rate two to three times that of the community.

Table 4.15: Number of observed deaths and expected deaths in the veteran population, 1993–1997

	Observed deaths	Expected deaths	Standardised mortality ratio
Male gold card holders	49,501	43,260	1.14
Male white card holders	12,584	13,545	0.93
Female gold card holders	18,194	19,125	0.95

Note: Observed deaths, expected deaths and standardised mortality ratio in the DVA treatment population, by sex and card type, 1993–97. Expected deaths is the number of deaths, had veterans experienced the death rates of the general Australian population.

Source: Covance 2000.

Health studies of Korean and Vietnam War veterans

A study of the mortality of Australian veterans of the Korean War in the period 27 June 1950 to 31 December 2000, after their Korean service, was completed recently (Harrex et al. 2003).

The study demonstrated that participation in the Korean War is associated with an overall increase in mortality rate of 21% compared with an equivalent Australian male population, and an increase in cancer mortality of 31%. Cancer deaths associated with smoking were particularly high but the study showed that smoking was not the only reason for the elevated death rate. Other elevated causes of death included suicide (31% excess), respiratory diseases (32%), digestive diseases (35%) and cardiovascular diseases (13%).

In 2003 the AIHW compared cancer incidence among Korean War veterans over the period 1982–1999 with an expected incidence that was based on the Australian community (AIHW 2003b). This study showed that the incidence of all cancers among Korean War veterans was between 13% and 23% higher than expected. Much of this difference was due to the higher incidence among veterans of head and neck cancer (between 76% and 90% higher than expected), larynx cancer (60–72% higher), oesophagus cancer (42–54%) and lung cancer (31–42%). Smoking is a major risk factor with each of these cancers.

Among service types, Korean War veterans who served in the Navy and Army had an incidence of cancer that was between 13% and 25% higher than expected. Veterans who served in the RAAF showed no difference in the incidence of total cancer from expected, but did show between 64% and 68% higher incidence of melanoma.

The 1997 Morbidity Study into the health of Vietnam veterans and their children (DVA 1998b), and the subsequent Validation Study by the AIHW of the results of this study (AIHW 1999a), identified a number of health conditions where prevalence was higher among veterans and their children compared to the expected prevalence. The Validation Study found that, among veterans, the prevalence of melanoma of the skin and prostate cancer was higher than expected, based on Australian community rates. However, the prevalence of a range of other disorders, including colorectal, breast and eye cancer, non-Hodgkin's lymphoma and leukaemia, motor neurone disease and multiple sclerosis, was found to be no different than expected from that in the general community. For veterans' children, the prevalence of spina bifida maxima, cleft lip or palate, and deaths due to accident, illness and suicide were all shown to be higher than expected. Suicide among veterans' children was shown to be three times as frequent as expected, based on the Australian community prevalence.

4.8 Health of prisoners

On an average day during 2002–03, over 22,000 persons were detained in Australian prisons. The national rate of imprisonment during this year was 147 per 100,000 adults, a slight increase from 145 in 2001–02. The Northern Territory reported the highest imprisonment rate of 519 per 100,000 adults in 2002–03, while the Australian Capital Territory reported the lowest rate of 80. Most prisoners are male (93%), with the highest rate of imprisonment among the 25–29-year age group. Indigenous persons are over-represented, comprising 20% of the prisoner population in 2002 (ABS 2003f).

National data on the health status of Australian prisoners are unavailable. The information that is available indicates that this substantial population group is mostly from a disadvantaged socioeconomic background, often has poor physical and mental health status, frequently engages in risk-taking health behaviour and, as a result, has special health needs.

Two states have recently completed prisoner health surveys, enabling some health comparisons to be made (Table 4.16). The 2001 New South Wales Inmate Health Survey found that a high proportion of prisoners tested positive for communicable diseases, particularly hepatitis C (40% of the males, 64% of the females), hepatitis B (28% males, 31% females), and herpes simplex virus Type 1 (85% males, 89% females) and Type 2 (19% males, 51% females) (Butler & Milner 2003). The 2002 Queensland Women Prisoners' Health Survey found similarly high rates of hepatitis C (45%) (Hockings et al. 2002).

Table 4.16: Health conditions and risk behaviours among prisoners in full-time custody, New South Wales, 2001, and Queensland, 2002 (per cent)

	New South Wales		Queensland
	Males	Females	Females
Communicable diseases			
Hepatitis C antibody	40	64	45
Hepatitis B antibody	28	31	12
Herpes simplex virus, Type 1	85	89	n.a.
Herpes simplex virus, Type 2	19	51	n.a.
Risk factors and behaviours			
Ever used illicit drugs	80	84	80
Regular drug use at time of incarceration[(a)]	67	74	63
History of injecting drug use	53	73	56
Current smoker	78	83	83
Harmful or hazardous alcohol use	48	29	38
Overweight/obese	50	44	20
Mental health			
Treatment for emotional or mental health problem	41	54	61
Suicide attempt	20	30	32
Self-harm	12	21	21
Sexual abuse before age 16	37	60	43

n.a. Not available.

(a) Refers to daily or almost daily use of illicit drugs.

Sources: Hockings et al. 2002; Butler & Milner 2003.

Exposure to bloodborne viruses such as hepatitis C and hepatitis B is largely associated with injecting drug use. More than half of all male and female prisoners surveyed reported a history of injecting drug use. Regular drug use at the time of incarceration, which may include injecting, was reported by 67% of male prisoners in New South Wales, as well as 74% and 63% of female prisoners in New South Wales and Queensland respectively.

The proportion of current smokers among surveyed prisoners was over four times that of the general community (approximately 80% of prisoners compared with less than 20% among the total population aged 14 years and over) (AIHW 2002a). Additionally, almost half of all male prisoners and 29% of female prisoners in New South Wales reported consuming harmful or hazardous quantities of alcohol in the 12 months before imprisonment (Butler & Milner 2003). Rates were even higher among female prisoners in Queensland. The prevalence of harmful drinking among Indigenous women incarcerated in northern Queensland was over 70% (Hockings et al. 2002). In contrast, less than 10% of persons aged 14 years and over in the general community drank alcohol at levels considered to provide long-term health risk (AIHW 2002a).

Mental health concerns are common among inmates. In New South Wales, 41% of male and 54% of female inmates, and in Queensland 61% of female inmates, reported some form of treatment for an emotional or mental illness during their lifetime. Depression and anxiety were common diagnoses—schizophrenia was also diagnosed in 5% of male and 3% of female inmates in New South Wales, and 6% of female inmates in Queensland. One in five males and one in three females indicated that they had attempted suicide, as well as one in ten males and one in five females deliberately harming themselves. Sexual abuse before the age of 16 was widely reported, especially among female inmates.

Data on the HIV status of adults entering prisons is collected and published by the National Centre in HIV Epidemiology and Clinical Research. HIV testing on admission is not compulsory in all states and territories and in 2002 only 59% of adults admitted to Australian prisons were tested (NCHECR 2003) (Table 4.17). Testing was mandatory in Queensland and the Northern Territory; data were unavailable for Victoria. In 2002, 21 inmates (0.1%) tested positive for HIV antibodies.

Table 4.17: Proportion of new prisoners tested for and diagnosed with HIV, 2002

	NSW	Vic	Qld	WA	SA	Tas	ACT[(a)]	NT	Aust
Number of receptions	11,433	n.a.	11,108	6,207	2,643	1,520	108	1,751	34,770
Tested for HIV antibody (%)	35.6	n.a.	100.0	40.9	24.8	30.6	25.9	100.0	59.3
Number (%) with HIV	4 (0.1)	n.a.	7 (0.1)	4 (0.2)	3 (0.5)	1 (0.2)	0 (0.0)	2 (0.1)	21 (0.1)

n.a. Not available.

(a) The corrections centre in the ACT is a remand centre only. HIV antibody testing is carried out on prisoner request. Data only available for the last two months of 2002.

Source: NCHECR 2003.

Information on causes of deaths in prisons is also available nationally and is published by the Australian Institute of Criminology. In 2002, there were 50 prison custody deaths—of the 42 deaths for which a cause was noted, 23 were deemed to be of natural causes, 5 of multiple causes, and 14 through suicide by hanging (Collins & Ali 2003).

4.9 Health conditions of people with a disability

At the broadest level, the ABS 1998 Survey of Disability, Ageing and Carers estimated that over 3.6 million Australians (19.3% of the population) had some form of disability. These disabilities and accompanying functional limitations are in turn associated with a wide range of health conditions. A particular level of disability or functional limitation (for instance, needing assistance with self-care) may be shared by people with health conditions as diverse as diabetes, cardiovascular disease, mental illness or paraplegia. This large group of Australians is therefore deserving of attention in its own right from the perspective of health as well as disability.

This section summarises the most common health conditions associated with the five broad disability groups outlined in the overview of disability in Chapter 2. The most common health conditions associated with disability in Australia are summarised in Box 4.3.

Self reported health of people with a disability

Survey respondents aged 15 and over with a disability in 1998 tended to report lower levels of health than the general population. 'Poor health' was reported by 11.0% of the sample of people with a disability and 'excellent health' by 8.6% (Table 4.18). In comparison, 4.8% of a sample from the general population reported 'poor health' and 18.9% reported 'excellent health' (ABS 2002b).

Table 4.18: Self-perceived health by disability status, persons aged 15–64 years, 1998 (per cent)

Self-perceived health	Profound core activity restriction	Severe core activity restriction	Total with disability[(a)]
Excellent	6.4	3.7	8.6
Very good	11.6	11.7	21.5
Good	20.8	29.6	34.7
Fair	29.2	33.1	24.1
Poor	32.0	21.9	11.0
Total	**100.0**	**100.0**	**100.0**
Total ('000)	*85.8*	*338.4*	*1,926.1*

(a) 'Total with disability' is not the sum of the preceding columns. It includes people with a disability but no profound or severe core activity restriction.

Source: AIHW 1999b.

Accessibility of the health system and related outcomes

There is growing attention to the questions of how accessible the health system is for people with disabilities, and what effect this has on their health.

Durvasula and Beange (2001) reviewed emerging evidence that people with intellectual disabilities have poorer health, in terms of lower life expectancy and more prevalent other physical and mental health problems, than the general population. They also found that people with intellectual disability do not access health services, in particular preventive health care, to the same extent as the rest of the population. A Sydney-based study has found higher mortality rates among people with intellectual disability (Durvasula et al. 2002). People with intellectual disabilities were less likely to undergo health screening and were less exposed to health promotion than other patients attending general health services.

Box 4.3: Common diseases or conditions associated with disability

Intellectual, psychiatric, sensory/speech and physical/diverse disability may be associated with various diseases or conditions. On the basis of self-report, or responses from carers, some of the most commonly associated diseases or conditions in 1998 were:

Intellectual disability

- *Around 60,100 people with an intellectual disability, or 0.3% of the Australian population, had ADHD. Of these, 42,700 were children aged under 15 (1.1% of children of that age).*
- *Nearly 10,000 people had conditions associated with Down syndrome.*
- *About 10,700 children aged under 15, or 0.3% of children of that age, had autism and related conditions.*

Psychiatric disability

- *Nervous tension or stress was the most common condition associated with a psychiatric disability, affecting 258,200 people, or 1.4% of the population.*
- *There were 177,400 people (1.0%) who had depression and about 30,500 people (0.2% of the total population) who suffered from schizophrenia.*
- *Around 100,300 people (0.5% of the total population) had dementia. Most of these were aged 65 and over (4.2% of the population of that age).*

Sensory/speech disability

- *Loss of sight was mostly associated with cataract (79,300 people, or 0.4% of the total population) and glaucoma (56,400, or 0.3% of the total population). These conditions were mostly found among people over the age of 65.*
- *Around 78,100 people, or 0.4% of the total population, had a congenitally related hearing loss. About 330,100 people, or 1.8% of the population, had a hearing loss associated with exposure to loud noise. (Note that most hearing loss in the general population is related to ageing.)*

Physical diverse/disability

- *More than one million people had one or more heart diseases or related conditions. Around 638,200 people, or 3.4% of the total population, had high blood pressure.*
- *About 408,700 people, or 2.2% of the total population, had asthma-related conditions. Asthma was most commonly reported among children of school age (5–14), 66,000 people or 2.5% of children of that age.*
- *Back problems were the most common musculoskeletal condition other than arthritis; 1,007,000 people, or 5.4% of the total population, had these conditions. There were 72,500 people, or 0.4% of the total population, who reported having osteoporosis, mostly people aged 45 or older.*
- *There were 90,900 people (0.5%) who had conditions associated with epilepsy and 55,000 (0.3%) who had conditions associated with migraines. About 31,000 people (0.2%), mostly among those aged 65 or more, had conditions associated with Parkinson's disease.*

Source: AIHW 2003g; AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

Possible barriers in providing general health care for people with developmental disabilities include a lack of comprehensive medical histories and insufficient physical access to community facilities (Burbidge 2003; Parmenter et al. 1999). Health professionals treating people with various disabilities do not always have sufficient knowledge of the relevant conditions, inhibiting the provision of effective health care (Buzio 2001; Parmenter et al. 1999). Specific measures have been suggested in order to counter these problems and barriers, such as standards regarding the frequency of checking dental health, hearing and vision (Beange et al. 1999). The Centre for Developmental Disability Studies in Sydney has been involved in programs funded by the NSW Health Department to sensitise hospital staff to the needs of people with disabilities, and is developing a training package for doctors relating to cervical screening for women with disabilities (Parmenter 2003).

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5 Health resources

5.1 Introduction

As with most areas of endeavour, the resources available to provide for the health care needs of a population are limited. Other chapters concentrate on the outcomes of the health system; this chapter focuses on the financial and human resources Australia uses and how they are allocated in achieving those outcomes.

When examining how much is spent on health and who provides the funds for that spending, two concepts are used—funding and expenditure. These concepts, while related, are quite distinct (see Box 5.1). Nevertheless, when discussing expenditure on major health services categories, which include public hospitals, medical services, pharmaceuticals and private hospitals, it is important to include some discussion of the particular funding arrangements for them.

Box 5.1: Defining health funding and expenditure

Health funding

Health funding is reported on the basis of who provides the funds that are used to pay for health expenditure. In the case of public hospital care, for example, although the states and territories incur the related expenditure, the Australian Government and the states and territories together provide over 90% of the funding. Some other funding comes from private health insurers (for insured patients) and from individuals who choose to be treated as private patients and pay any fees charged.

Health expenditure

Health expenditure is reported in terms of who incurs the expenditure, rather than who ultimately pays for that expenditure. In our example of public hospital care, all the related expenditures (that is, expenditure on medical and surgical supplies, drugs, salaries of doctors and nurses, etc.) are incurred by the states and territories although a considerable proportion of those expenditures is funded by transfers from the Australian Government.

Summary of health resources in Australia

Below are some important aspects of health resources in Australia featured in this chapter:

- National expenditure on health was equivalent to 9.3% of gross domestic product (GDP) in 2001–02, compared with 8.9% in 1999–00 (Table 5.1).
- Total health expenditure was $66.6 billion in 2001–02, compared to $55.8 billion in 1999–00 (Table 5.1). Of this, governments funded 68.6%, which was lower than the government share (69.9%) in 1999–00 (Table 5.11).

- Health expenditure per person was $3,292 in 2001–02, up from $3,034 in 1999–00 (constant 2000–01 dollars) (Table 5.3).
- Spending on hospital services accounted for more than one-third (35.4%) of recurrent expenditure in 2001–02, compared with 36.6% in 1999–00 (Table S.48).
- Real growth in recurrent expenditure averaged 5.7% per year between 1999–00 and 2001–02. The major drivers of this growth were expenditures on pharmaceuticals, which averaged growth of 13.9% per year and private hospitals (5.1% per year) (Table S.45).
- The Australian Government provided 46.3% of total funding in 2001–02 compared with 46.9% in 1999–00, while the states, territories and local governments provided 22.3%, compared with 23.0% in the earlier year. Funding from the non-government sector increased from 30.1% to 31.4%. (Table 5.11).
- In 2001, there were 2,322 health workers for every 100,000 people living in Australia. This was an increase from 2,206 in 1996.
- Nursing workers per 100,000 population decreased from 1,267 in 1996 to 1,259 in 2001.
- The health workforce is ageing. About 39% of people employed in health occupations were aged 45 years or more, up from 31% in 1996. The proportion of workers aged 45+ increased faster for females (from 29% to 37%) than for males (from 38% to 43%), reflecting the rapid ageing of the female nursing labour force.
- The 'oldest' health occupations were medical workers, complementary therapy workers and pharmacists.
- In the 2001 Census, 3,742 people reported being Indigenous and employed in a health occupation. Half of these were employed in nursing.
- Nearly half (47%) of medical workers reported working 49 or more hours per week, far higher than any other broad health occupational group. Conversely, more than half (51%) of nursing workers worked less than 35 hours per week.
- In most health industries there were decreasing rates of employees with increasing remoteness in 2001. For example, there were 1,147 per 100,000 head of population employed in hospitals in major cities, compared with 601 in very remote areas. Small industries, in particular, were not as well represented in more remote regions. For example, in the optometry and optical dispensing industry, the ratios were 53 per 100,000 population in major cities compared to 14 and 2 in remote and very remote areas, respectively.

5.2 Health expenditure

Health expenditure in Australia covers expenditure on the range of health goods and services that are provided by governments, by non-government organisations and by individual health service providers. It also includes expenditure on health research and administration and capital expenditure (such as buildings and equipment).

In this chapter, total expenditure on health is examined in terms of recurrent and capital expenditures. Recurrent expenditure, which relates to operational expenditures, is split between the major types of health goods and services and health-related activities. Capital expenditure, on the other hand, relates to large-scale investment in plant and facilities that often support a range of health services and cannot readily be allocated to individual health goods and services.

Some of the main factors contributing to changes in health expenditure over time are described in this chapter. Expenditure over recent years is compared across states and territories. Furthermore, Australia's expenditure is compared with that of other OECD member countries.

Expenditure on health in Australia, 1991–92 to 2001–02

Estimated total expenditure on health in Australia in 2001–02 was $66,582 million or 9.3% of national GDP (Table 5.1). By way of comparison, in 1999–00, Australians spent $55,809 million or 8.9% of GDP on health, and the $33,123 million spent on health in 1991–92 represented 8.1% of GDP in that year.

Table 5.1: Total health expenditure and GDP, current prices, 1991–92 to 2001–02

Year	Total health expenditure ($ million)	GDP ($ million)	Ratio of health expenditure to GDP (%)
1991–92	33,123	406,605	8.1
1992–93	35,098	426,231	8.2
1993–94	36,990	447,024	8.3
1994–95	39,216	471,349	8.3
1995–96	42,082	502,828	8.4
1996–97	45,296	529,885	8.5
1997–98	48,273	561,229	8.6
1998–99	51,629	591,916	8.7
1999–00	55,809	628,620	8.9
2000–01	60,897	669,307	9.1
2001–02[(a)]	66,582	712,874	9.3

(a) Based on preliminary AIHW and ABS estimates.

Sources: AIHW Health Expenditure Database; *ABS Australian National Accounts–National Income, Expenditure and Product, June quarter*, various years (Cat. No. 5206.0).

Between 1991–92 and 2001–02, real growth in health expenditure averaged 4.6% per year (Table 5.2). The period of most rapid growth, averaging 5.4% per year, was between 1997–98 and 2001–02.

The gradual increase in the ratio of health expenditure to GDP was due to nominal expenditure on health rising faster than nominal expenditure on other areas within the economy. This, in turn was partly the result of faster real growth in the health area and partly due to excess health inflation (see Australian and international health expenditure for an explanation of excess health inflation).

Table 5.2: Total health expenditure and GDP, constant prices[(a)], 1991–92 to 2001–02

	Total health expenditure		GDP	
Year	Amount ($m)	Growth rate (%)	Amount ($m)	Growth rate (%)
1991–92	41,002	. .	473,559	. .
1992–93	43,093	5.1	490,901	3.7
1993–94	44,417	3.1	510,002	3.9
1994–95	46,062	3.7	531,577	4.2
1995–96	48,021	4.3	554,001	4.2
1996–97	50,362	4.9	574,989	3.8
1997–98	52,280	3.8	600,590	4.5
1998–99	54,632	4.5	632,488	5.3
1999–00	57,810	5.8	657,771	4.0
2000–01	60,897	5.3	669,307	1.8
2001–02[(b)]	64,529	6.0	695,633	3.9
Average annual growth rates				
1992–93 to 1997–98		3.9		4.1
1997–98 to 2001–02		5.4		3.7
1991–92 to 2001–02		4.6		3.9

. . Not applicable.

(a) See Box 5.2 for explanation of constant price estimating method.

(b) Based on preliminary AIHW and ABS estimates.

Sources: AIHW Health Expenditure Database; *ABS Australian National Accounts–National Income, Expenditure and Product, June quarter*, various years (Cat. No. 5206.0).

Box 5.2: Constant price estimates and current prices

Wherever 'constant price' estimates are shown they are intended to reflect changes in volume expressed in terms of prices in the reference year – 2000–01 in this publication. Most constant price estimates are calculated using the annually re-weighted chain price indexes produced by the Australian Bureau of Statistics (ABS). In some cases, however, chain price indexes are not available, and implicit price deflators derived by the ABS are then used to calculate the constant price estimates.

A full discussion of chain volume measures can be found in the 1997 ABS publication Chain Volume Measures in the Australian National Accounts *(ABS Cat. No. 5248.0).*

The term 'current prices' is used to refer to amounts reported for a particular year, unadjusted for inflation.

Average per person expenditure on health services

In 2001–02, Australians spent, on average, $3,397 per person on health (Table 5.3). After adjusting for inflation, per person health expenditure grew between 1991–92 and 2001–02 at an average of 3.4% per year. This growth reflects the combined effects of changes in the average number of health services used and the nature of those services.

Table 5.3: Health expenditure per person, current and constant prices[(a)], and annual growth rates, 1991–92 to 2001–02

	Amount ($)		Growth rate over previous year (%)	
Year	**Current**	**Constant**	**Current**	**Constant**
1991–92	1,904	2,357	. .	. .
1992–93	1,996	2,450	4.8	3.9
1993–94	2,082	2,500	4.3	2.0
1994–95	2,183	2,564	4.9	2.6
1995–96	2,313	2,639	5.9	2.9
1996–97	2,458	2,733	6.3	3.6
1997–98	2,591	2,807	5.4	2.7
1998–99	2,741	2,900	5.8	3.3
1999–00	2,929	3,034	6.9	4.6
2000–01	3,147	3,147	7.4	3.7
2001–02[(b)]	3,397	3,292	8.0	4.6
Average annual growth rates				
1992–93 to 1997–98			5.4	2.8
1997–98 to 2001–02			7.0	4.1
1991–92 to 2001–02			6.0	3.4

. . Not applicable.

(a) See Box 5.2 for explanation of constant price estimating method.

(b) Based on preliminary AIHW and ABS estimates.

Source: AIHW Health Expenditure Database.

Between 1998–99 and 2000–01, per person expenditure on health in Australia grew at an average of 8.5% per year (Table 5.4). In five jurisdictions, South Australia (17.9%); Western Australia (10.9%); Victoria (10.3%); Queensland (9.5%); and the Northern Territory (15.9%), growth was faster than the national average, while the growth rates in Tasmania (8.0%), New South Wales (5.5%) and the Australian Capital Territory (3.2%) were all below that average.

Table 5.4: Average per person expenditure on total health, 1998–99 to 2000–01, constant prices[(a)] ($)

State/territory	1998–99	1999–00	2000–01	Change 1998–99 to 2000–01 (%)
NSW	2,944	3,033	3,105	5.5
Vic	2,941	3,004	3,245	10.3
Qld	2,901	3,119	3,176	9.5
WA	2,748	2,868	3,047	10.9
SA	2,754	3,017	3,246	17.9
Tas	2,934	3,072	3,168	8.0
ACT	3,019	3,175	3,117	3.2
NT	3,036	3,260	3,518	15.9
Australia	**2,900**	**3,034**	**3,147**	**8.5**

(a) See Box 5.2 for explanation of constant price estimating method.

Source: AIHW Health Expenditure Database.

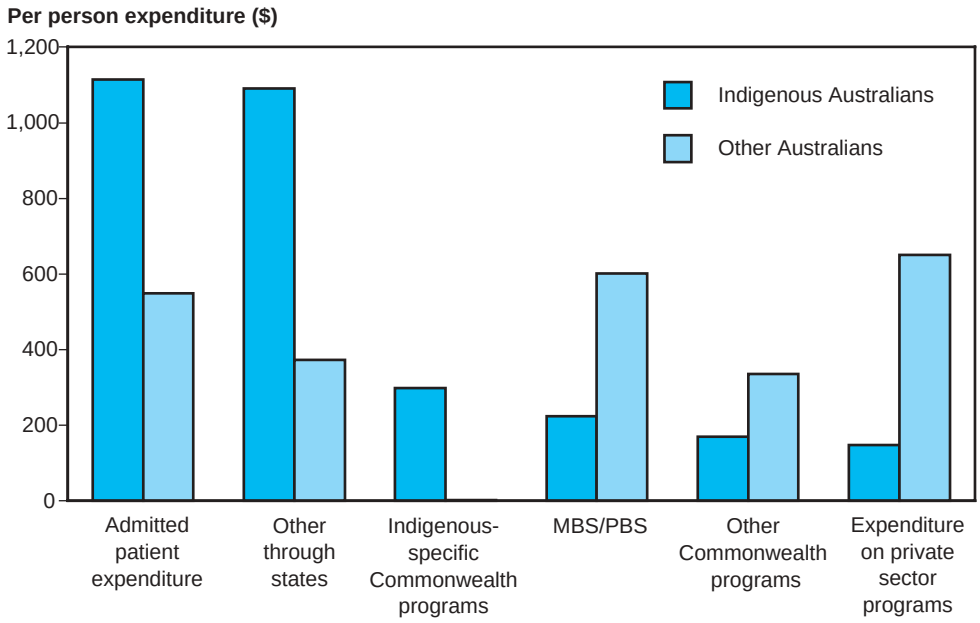
Expenditure on health services for Aboriginal and Torres Strait Islander people

The latest estimates of expenditure on health for Aboriginal and Torres Strait Islander people relate to 1998–99 (AIHW 2001a).

Despite their much poorer health status on a number of health indicators (see Chapter 4), average per person expenditure on health services for Indigenous people in 1998–99 was only 22% higher than for the rest of the population.

Total recurrent health expenditure on Indigenous people was estimated at $1,245 million, or 2.6% of total recurrent health expenditure across the entire population. That translates into an average of $3,065 per Indigenous person, compared with an average of $2,518 for other Australians (Table S.47).

There were substantial differences in the patterns of expenditure applying to services for Aboriginal and Torres Strait Islander people and to services for non-Indigenous people. The ratio of Indigenous per person expenditure to that of other Australians for all health programs for which state and territory governments had primary responsibility (including public hospitals and community health services) was 2.4:1 (Figure 5.1).



Source: AIHW Health Expenditure Database.

Figure 5.1: Estimated health expenditures per person for Aboriginal and Torres Strait Islander people and other Australians, 1998–99

Although the Australian Government jointly funds public hospitals, they are not included as an Australian Government program for the purpose of determining Indigenous to non-Indigenous expenditure ratios. They are included as state or territory government health services.

For the other two major Commonwealth funding programs, Medicare and the PBS, average per person expenditure on Aboriginal and Torres Strait Islander people was just over one-third (37%) that of other Australians. After including spending on Indigenous-specific Australian Government programs (essentially grants to Aboriginal Community Controlled Health Services) and other nationwide Commonwealth health services, the Indigenous to non-Indigenous expenditure ratio was 0.74:1.

Average expenditure on private services (that is, neither Commonwealth nor state or territory services) provided to Aboriginal and Torres Strait Islander people, such as private hospital and dental services, and services provided by other heath professionals, was also much lower than for the other Australian population. The Indigenous to non-Indigenous expenditure ratio for all non-government health goods and services, combined was 0.23:1.

Expenditure on veterans

Expenditure by the Department of Veterans' Affairs (DVA) on health and other care services in 2002–03 totalled $3,631 million. This provided services largely to eligible veterans, their war widows and widowers with gold or white DVA cards (Table 5.5). The largest components were for hospitals, and for Local Medical Officers (general practitioners) and specialists. Note that elsewhere in this chapter, DVA expenditure is included in expenditure of the Australian Government but not separately identified.

Table 5.5: Department of Veterans' Affairs health expenditure[(a)], 2002–03

Type of health service	$ million
Pubic and Private hospitals	1,446
Local Medical Officers and Specialists	633
Residential Aged Care Subsidy	630
Pharmaceuticals	417
Allied Health	110
Rehabilitation Appliances	75
Dental Services	67
Community Nursing	63
Veterans' Home Care	75
Travel for Treatment	68
Other	46
Total	**3,631**

(a) Actual expense for 2002–03.

Note: Components do not add to totals due to rounding.

Source: DVA unpublished data.

DVA health expenditure on eligible gold card holders rose from an average of $5,800 per card holder in 1996–97 to an estimated $10,300 in 2002–03 (Table 5.6).

Table 5.6: Department of Veterans' Affairs health expenditure, aggregate and per eligible gold and white card holder[(a)], 1996–97 to 2002–03

Year	DVA-administered health expenditure ($ million)	Eligible veteran population[(b)] at 30 June (number)	Expenditure per gold cardholder ($)
1996–97	1,600	340,327	5,800
1997–98	1,800	339,310	6,600
1998–99	2,000	353,840	6,900
1999–00	2,300	348,996	7,600
2000–01	2,500	345,131	8,400
2001–02	2,700	340,716	9,350
2002–03[(c)]	3,000	335,160	10,300

(a) Excludes residential aged care subsidy, salaries and administration and certain minor items not directly related to veteran health care (e.g. health research). These expenditures are included in Table 5.7.

(b) Includes gold and white cardholders.

(c) Estimate subject to revision.

Source: DVA Annual Reports and DVA unpublished data.

Recurrent expenditure by type of health service

In 2001–02, recurrent expenditure on health was estimated at $62,693 million, or 94.2% of total expenditure on health, whereas in 2000–01 recurrent expenditure sat at $57,297 million (tables S.43 and S.44). The largest component of recurrent expenditure in 2001–02 was for hospital services, totalling $22,236 million. This was made up of public (non-psychiatric) hospitals ($16,678 million), public (psychiatric) hospitals ($409 million) and private hospitals ($5,149 million).

Spending on medical services ($11,187 million) and pharmaceuticals ($8,989 million) were the next largest expenditures, representing 17.9% and 14.4% of all recurrent expenditure, respectively (Table S.48). High-level residential care and dental services accounted for 6.6% and 5.9% of recurrent expenditure, respectively. A further $2,521 million or 4.0% of recurrent expenditure was spent on services provided by other health professionals, such as physiotherapists, chiropractors, acupuncturists, psychologists and podiatrists.

Expenditure on hospitals

Hospital services (public and private, combined) accounted for 35.4% of recurrent expenditure in 2001–02. This was marginally higher than in 2000–01 (35.3%). It was below the proportion in 1999–00 (36.6%) and much lower than at the beginning of the 1990s (39.7% in 1991–92) (Table S.48).

The decline between 1991–92 and 2001–02 was largely related to the public hospital systems of the states and territories. In 1991–92, 30.7% of all recurrent expenditure on health was for public (non-psychiatric) hospitals. This fell to 27.7% by 1999–00, 26.8% in 2000–01 and 26.7% in 2001–02. Expenditure on private hospitals, on the other hand, which had consumed 7.1% of recurrent expenditure in 1991–92, rose to 8.2% in 1998–99, fell to 8.0% in 1999–00 and 7.8% in 2000–01, and recovered to 8.0% in 2001–02.

Expenditure on public (non-psychiatric) hospitals represented three-quarters of all expenditure on hospitals during 2001–02 (Table S.42A). Such hospitals are largely funded through five-year funding agreements between the Commonwealth and the states and territories. Consequently, those funding agreements exert major influences on levels of expenditure on hospitals.

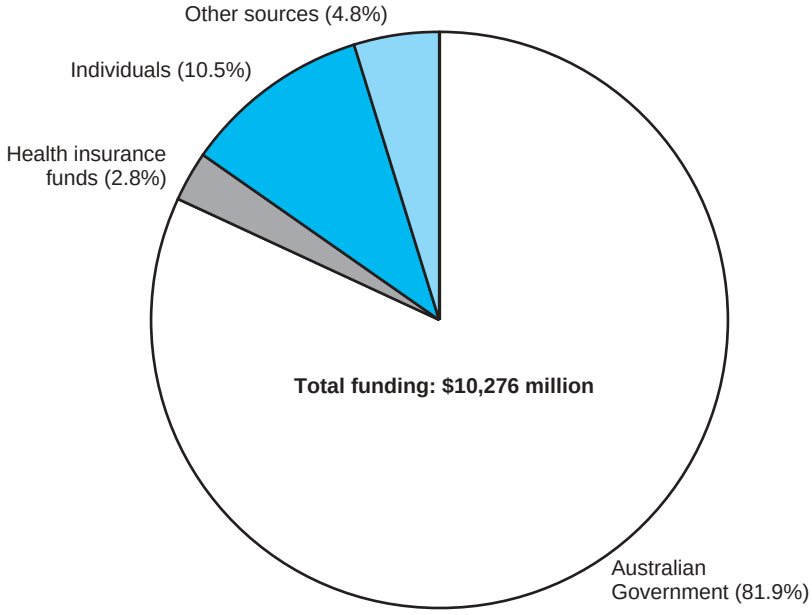
Private hospitals accounted for 23.2% of expenditure on hospitals and public (psychiatric) hospitals for the remaining 1.8%.

Expenditure on medical services

The following discussion of expenditure on medical services relates essentially to services provided by private medical practitioners operating on a fee-for-service basis. Most of these services attract benefits under Medicare. It includes medical services provided to private patients in hospitals, but does not include the 'medical' component of care provided to public patients in public hospitals, which is included as expenditure on hospitals.

Total expenditure on medical services in 2000–01 was $10,276 million (Table S.43 and Figure 5.2). In 2001–02 it was estimated at $11,187 million (Table S.44), or 17.9% of recurrent expenditure in that year (Table S.48).

Expenditure on medical services averaged real growth of 3.7% per year between 1991–92 and 2001–02 (Table S.45). Preliminary expenditure estimates for 2001–02 indicate that $11.2 billion was spent on medical services in that year (Table S.44).



Source: Table S.43.

Figure 5.2: Recurrent expenditure on medical services, current prices, by source of funds, 2000–01

Medical indemnity

Most of the estimated $11.2 billion spent on medical services in 2001–02 flowed through private medical practices and was used to finance the expenses incurred by those practices. An important such expense is the premiums paid to indemnify the practices themselves and the practitioners who operate within the practices. In the case of general medical practices, professional indemnity insurance expenses were estimated at $61.3 million in 2001–02 (ABS 2003). This represented, on average, 1.9% of the total operating expenses of those medical practices. For specialist practices, the professional indemnity insurance cover expenses totalled $191.6 million, or about 4.8% of their operating expenses. For pathology laboratories it was $3.7 million (0.3% of operating expenses). These estimates relate only to the expenses incurred by medical practices on behalf of either the practices or the medical practitioners who work in the practices (and who may be principals or employees of the practices). Some individual practitioners personally pay for indemnity cover and those payments are not included in expenses of the practices; therefore, the amounts shown above do not represent total expenditure on professional indemnity insurance.

Expenditure on pharmaceuticals

Expenditure on pharmaceuticals includes expenditure on prescribed medications (both PBS and non-PBS) as well as over-the-counter medicines and other non-durable therapeutics.

Pharmaceutical expenditure increased consistently as a component of recurrent expenditure during the 1990s. In 1991–92 expenditure on pharmaceuticals sold in pharmacies, supermarkets and other retail outlets represented 9.9% of recurrent expenditure; this had risen to 14.1% by 2000–01 and an estimated 14.4% in 2001–02 (Table S.48).

Estimated expenditure on these non-hospital pharmaceuticals, alone, was $8,989 million in 2001–02. This comprised $5,586 million on benefit-paid pharmaceuticals and $3,320 million on other non-hospital pharmaceuticals. The Commonwealth contributed $4,746 million in benefits under the PBS and the Repatriation Pharmaceutical Benefits Scheme (RPBS). Individual patients paid $841 million in statutory co-payments under the PBS and RPBS and $3,189 million by way of payments for non-benefit pharmaceuticals (Table 5.7).

Total expenditure on all pharmaceuticals in 2001–02 was estimated at $10,304 million (Table 5.7). This included $1,315 million of drugs used by hospitals in the provision of hospital services. These in-hospital expenditures are not normally included in national estimates of expenditure on pharmaceuticals, but are included as part of estimates of expenditure on hospitals. The $1,315 million estimated expenditure on in-hospital drugs was made up of $1,105 million on drugs dispensed in public hospitals and $210 million on drugs in private hospitals.

Expenditure on benefit-paid items under the PBS was the largest single component of total expenditure on pharmaceuticals. The cost to government under the PBS (not including expenditure under the RPBS) in 2001–02 was $4,181 million. This increased to an estimated $4,572 million in 2002–03 (Table 5.8). The share of total cost of the PBS met by the Commonwealth has risen each year in recent years. In 1998–99 the government share was 82.2% and this rose to 83.8% in 2001–02 and 84.2% in 2002–03.

Table 5.7: Expenditure on pharmaceuticals[(a)], current prices, 2001–02 ($ million)

	Benefit-paid pharmaceuticals	All other pharmaceuticals		Total pharmaceuticals
		Non-hospital	Hospital	
Public sector				
Australian Government Department of Veterans' Affairs	357	. .	. .	357
Australian Government Department of Health and Ageing[(a)(b)]	4,389	86	. .	4,475
Public acute care and psychiatric hospitals[(c)]	. .	. .	1,105	1,105
Total public sector	*4,746*	*86*	*1,105*	*5,936*
Private sector				
Health insurance funds	. .	44	. .	44
Individuals	841	3,189	. .	4,030
Private hospitals[(d)]	. .	. .	210	210
Other non-government	. .	83	. .	83
Total private sector	*841*	*3,317*	*210*	*4,334*
Total[(b)]	**5,586**	**3,403**	**1,315**	**10,304**

. . Not applicable.

(a) Includes $208 million in Section 100 payments for human growth hormones, IVF and other subsidised pharmaceuticals.

(b) Excludes $307 million in payments for highly specialised drugs.

(c) Includes $275 million in Australian Government payments to states for highly specialised drugs.

(d) Includes $32 million in Australian Government payments for highly specialised drugs.

Note: Some components may not add to totals due to rounding.

Source: AIHW Health Expenditure Database.

Table 5.8: Cost of PBS[(a)] items to the Australian Government and patients, 1998–99 to 2002–03 ($ million)

Benefit category	1998–99	1999–00	2000–01	2001–02	2002–03
Patient contributions					
General patients	318	346	407	444	489
Concessional patients	283	306	337	362	370
Total patient contributions	601	652	744	806	860
Government benefits					
General patients–no safety net	469	521	662	704	770
General patients–safety net	107	107	128	151	174
Total general patients	576	628	790	855	944
Concessional patients–no safety net	1,740	2,001	2,360	2,584	2,769
Concessional patients–safety net	467	548	660	743	859
Total concessional patients	2,207	2,548	3,020	3,326	3,629
Total cost to government	2,783	3,177	3,810	4,181	4,572
Total cost of PBS benefit-paid items[(b)]	3,384	3,828	4,554	4,987	5,432

(a) Does not include Repatriation Pharmaceutical Benefits Scheme.

(b) Excludes Section 100 payments for human growth hormones, IVF and other non-PBS subsidised pharmaceuticals.

Note: Some components may not add to totals due to rounding.

Source: DoHA 2003.

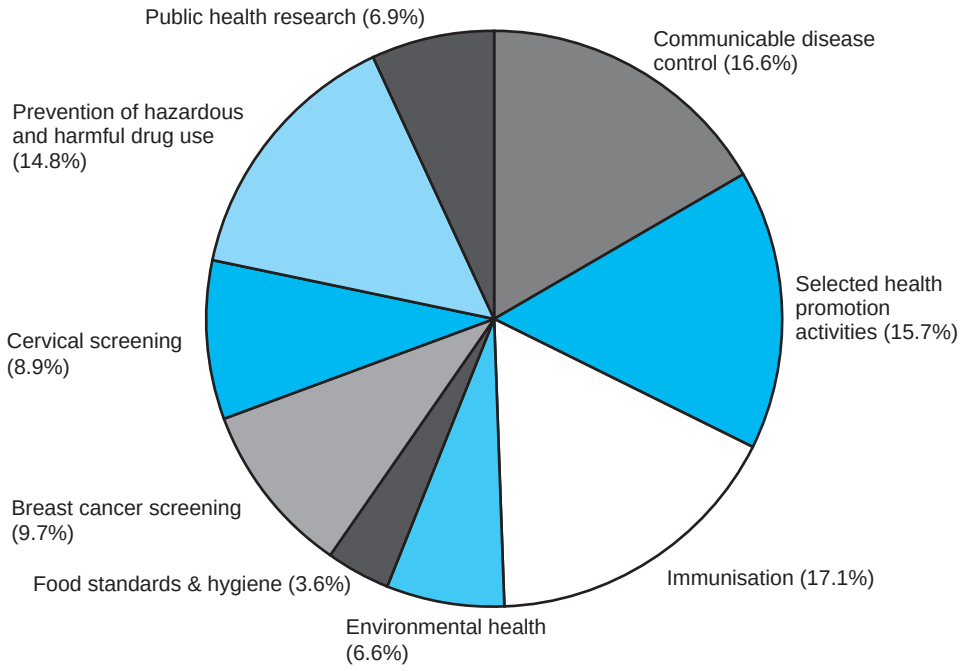
Expenditure on public health activities

Expenditure on public health activities has been described through the National Public Health Expenditure Project, an initiative of the National Public Health Partnership (AIHW 2001c; AIHW 2002b).

In 2000–01, estimated national expenditure on public health by the Australian Government and by state and territory health departments was $987.0 million (Table S.50). This amounted to 1.7% of total recurrent expenditure on health during that year.

At the national level, expenditure on organised immunisation accounted for $169.0 million or 17.1% of all expenditure on public health activities during 2000–01 and was the most significant single area of expenditure (Figure 5.3). The next largest areas of expenditure were communicable disease control (16.6% or $163.6 million) and selected health promotion (15.7% or $155.3 million). Another significant area of expenditure was on prevention of hazardous and harmful drug use ($146.2 million).

State and territory health departments spent $690.7 million on public health activities, of which $253.0 million was funded by the Australian Government. In addition, the Australian Government spent $296.3 million directly on its own public health programs.



Source: AIHW 2004b.

Figure 5.3: Expenditure on public health by activity, 2000–01

Capital expenditure

The roles of the different sectors in funding capital expenditure are quite diverse. State and territory governments control large-scale assets such as hospitals, community health centres and residential aged care facilities. Consequently, most of their capital expenditure is for the purchase of new or replacement assets . Most non-government investment relates to private hospitals and residential care facilities using a combination of funding by the private sector and by governments.

Total capital expenditure in 2000–01 was $2,631 million (Table S.43). Of this, 52.2% was sourced from state, territory and local governments. Non-government sources and the Australian Government accounted for 44.6% and 3.2%, respectively (Table 5.9).

Table 5.9: Shares of outlays on health capital, current prices, 1991–92 to 2000–01 (per cent)

	Government				
Year	Australian Government	State/territory and local	Total	Non-government	Total
1991–92	12.9	50.7	63.6	36.4	100.0
1992–93	8.8	49.4	58.1	41.9	100.0
1993–94	5.3	48.5	53.9	46.1	100.0
1994–95	0.5	54.6	55.1	44.9	100.0
1995–96	4.4	49.6	54.0	46.0	100.0
1996–97	2.7	52.1	54.8	45.2	100.0
1997–98	2.6	57.0	59.7	40.3	100.0
1998–99	6.5	54.3	60.8	39.2	100.0
1999–00	3.2	53.1	56.2	43.8	100.0
2000–01	3.2	52.2	55.4	44.6	100.0

Note: Some components may not add to totals due to rounding.

Source: AIHW Health Expenditure Database.

Australian and international health expenditure

This section compares Australia's health expenditure during the 1990s with that of other members of the OECD, with particular reference to six countries (Canada, France, Japan, New Zealand, the United Kingdom and the United States) with which Australia shares similar economic and social structures. The comparison gives an indication of the relative economic share of their health service delivery systems. Differences between countries, in terms of what is included as 'health services', complicate the comparison to some extent. Therefore, caution is advised when drawing conclusions from these comparisons.

Considerable work is currently being undertaken by the OECD to standardise definitions and increase the international comparability of estimates of health expenditure by member countries.

One useful measure of the relative burdens of health systems in different countries is the health expenditure to GDP ratio. This measures the proportion of a country's production that is used up by its health system. The average health expenditure to GDP ratio for all those OECD members that submitted data in both 1991 and 2001 was 9.4%

in 1991, 9.9% in 1996 and 10.6% in 2001 (Table S.52). For the group of seven selected countries mentioned above, the ratio was 10.0% in 1991, 10.6% in 1996 and 11.5% in 2001 (Table S.49). Australia's ratio (8.1% in 1991, 8.5% in 1996 and 9.3% in 2001) was consistently below both the OECD average and that of the smaller group throughout the period. The United States was by far the highest spender on health care, spending 13.9% of GDP on health in 2001.

Health expenditure per person was calculated after adjusting for differences in the purchasing powers of national currencies. This was done using broad GDP purchasing power parity calculations.

Throughout the period, Australia's per person expenditure on health was below both the OECD average and that of the seven selected countries. In 2001, its average was $3,397, compared with the OECD average of $3,690 (Table S.52) and the smaller group average of $4,755 (Table 5.10).

Table 5.10: Health expenditure per person, Australia and other selected OECD countries, current prices, 1991 to 2001[(a)] ($)

Year[(a)]	Australia	Canada	France	Japan	NZ	UK	USA	Average[(b)]
1991	1,904	2,483	2,240	1,594	1,355	1,410	4,051	2,847
1996	2,458	2,721	2,583	2,192	1,639	1,872	4,930	3,541
2001	3,397	3,741	3,432	2,856	2,291	2,669	6,548	4,755

(a) Australian and New Zealand data relate to the year ending 30 June in the following year; data for France relate to the calendar year indicated; data for Canada, Japan and the United Kingdom relate to the year commencing 1 April in the year indicated; and United States data relate to the year ending 30 September.

(b) Average weighted by population.

Note: Expenditures converted to Australian dollar values using GDP purchasing power parities.

Sources: AIHW Health Expenditure Database, OECD 2003.

Nominal increases in expenditure on health over time are the result of the combined effects of inflation (both general inflation and health inflation) and changes in the quantities of services used, either from population growth or from more intensive per person use of services.

Prices within the health sector often move at different rates from other prices throughout an economy. Movements in health prices (health inflation) result from a combination of the general inflationary pressures that apply throughout the economy and inflationary pressures that relate specifically to the health sector. The inflation (above the general rate of inflation) that can be attributed to these health sector-specific price pressures is referred to as 'excess health inflation'. The ability of a nation's health financing system to control health prices is an important factor in controlling growth in the share of GDP required to fund expenditure on health.

During the 1990s Australia's excess health inflation rate averaged 0.7% (Table S.53). Its general inflation rate over the same period averaged 1.8%, giving it an overall health inflation rate of 2.5% per year between 1991 and 2001. Canada (0.1%) and France (0.0%) both had excess health inflation rates that were below Australia's. Japan, on the other hand, had an excess health inflation rate of 2.7%.

Consequently, while Australia's health expenditure to GDP ratio increased by 1.2 percentage points, from 8.1% in 1991 to 9.3% in 2001, Canada's ratio did not increase from its 1991 level (9.7%) and France's increased by only 0.7 percentage points, from 8.8% in 1991 to 9.5% in 2001 (Table S.51). Japan's ratio, on the other hand, grew by 2.1 percentage points, from 5.9% in 1991 to 8.0% in 2001.

5.3 Funding of health expenditure

Funding for health services comes from both government and non-government sources. In the case of government sources, the contribution of each level of government—Commonwealth, state and territory, or local—differs, depending on the particular health services concerned.

Both the major levels of governments (that is, the Commonwealth (Australian Government), and the state and territory governments) provide funding for health services from their respective revenue sources. Local governments also fund health services from their own revenues. There are often difficulties in distinguishing funding provided by local governments from that provided by state governments for particular health care activities. Therefore, for much of the discussion that follows, funding by state and territory governments and local governments are combined.

The Commonwealth provided 46.3% of the funding for health expenditure in 2001–02; states and territories and local governments funded 22.3% and non-government sources provided 31.4% of funding (Table 5.11).

Table 5.11: Government and non-government sector expenditure as a proportion of total health expenditure, 1991–92 to 2001–02, current prices (per cent)

	Government			Non-government				
Year	Australian Government[(a)]	State/ territory and local	Total	Health insurance funds	Individuals[(a)]	Other	Total	Total
1991–92	42.8	24.6	67.3	11.5	16.7	4.5	32.7	100.0
1992–93	43.6	23.4	66.9	11.3	16.8	4.9	33.1	100.0
1993–94	45.1	21.3	66.4	11.0	17.0	5.7	33.6	100.0
1994–95	44.8	21.6	66.3	10.7	17.1	5.9	33.7	100.0
1995–96	45.1	22.0	67.1	10.5	16.0	6.3	32.9	100.0
1996–97	43.7	22.9	66.7	10.4	16.7	6.3	33.3	100.0
1997–98	44.7	23.8	68.5	8.8	16.5	6.1	31.5	100.0
1998–99	46.1	22.9	69.0	7.5	17.5	6.0	31.0	100.0
1999–00	46.9	23.0	69.9	6.5	17.4	6.2	30.1	100.0
2000–01	47.1	22.6	69.7	6.8	18.2	5.3	30.3	100.0
2001–02[(b)]	46.3	22.3	68.6	7.4	18.6	5.4	31.4	100.0

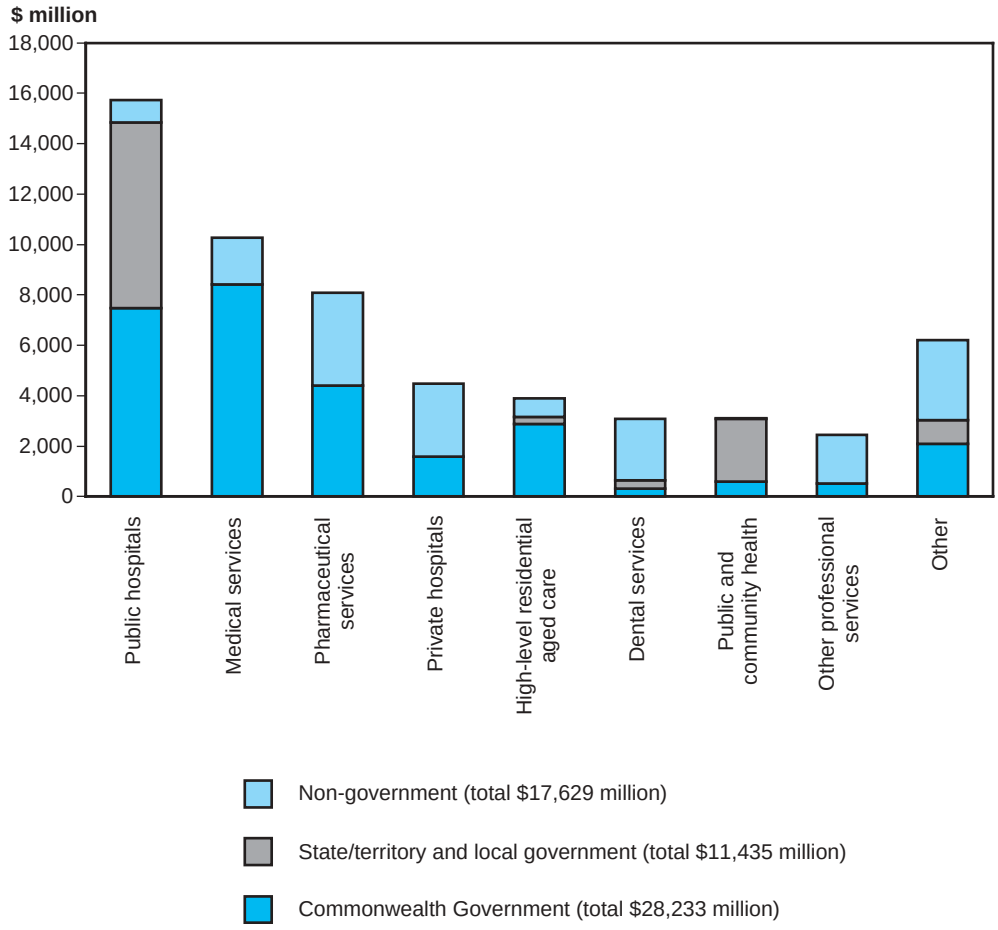
(a) Australian Government and individuals' expenditure has been adjusted for tax expenditures (see Table S.42).

(b) Based on preliminary AIHW and ABS estimates.

Note: Some components may not add to totals due to rounding.

Source: AIHW Health Expenditure Database.

As mentioned previously, the relative importance of the major funding sources varies according to the type of health service being funded. The Commonwealth is the most important source of funds for high-level residential aged care, medical services and health research. State and territory governments, on the other hand, provide most of the funding for community health services and public health activities. Funding for public hospitals is shared between the Australian Government and the states and territories, while funding for pharmaceuticals is shared between the Australian Government and non-government sources. Private hospitals are largely funded by non-government sources (Figure 5.4).



Source: AIHW Health Expenditure Database.

Figure 5.4: Recurrent health expenditure by health services area and source of funds, current prices, 2000–01

Funding by the Commonwealth

The Commonwealth provides most of the funding for:

- medical services and certain dental and other professional services covered by Medicare;
- high-level residential aged care; and
- pharmaceuticals under the Pharmaceutical Benefits Scheme (PBS).

Yet another avenue for funding by the Commonwealth is through specific purpose payments (SPPs) to the states and territories. The main health SPPs provided during 2000–01 were the payments under the Australian Health Care Agreements (AHCAs) and the Public Health Outcomes Funding Agreements, and SPPs for the provision of highly specialised drugs to outpatients in public hospitals and blood transfusion services.

It also funds health activities indirectly by subsidising private health insurance cover through the private health insurance rebates.

In 2001–02 more than half of the Commonwealth's recurrent health funding was directed to medical services (29.6%) and public (non-psychiatric) hospitals (26.2%) (calculated from Table S.44). Pharmaceuticals (15.8%) and high-level residential aged care (10.1%) were also major consumers of the Commonwealth's recurrent funding in 2001–02.

The Australian Government's Medicare Levy (see Box 5.3) raised $5.0 billion in 2001–02. This was equivalent to 16.2% of the estimated total health funding by the Australian Government, and is slightly lower than its share of 16.9% in 1999–00. As a proportion of total Commonwealth funding of health, the levy's contribution was higher than in its first full year of operation (1984–85), when it was 10.1%.

Box 5.3: Medicare levy

All Australian Government funding for health services comes from its general revenues, one part of which is notionally identified as health-related – the Medicare Levy.

This levy was introduced in 1984 and was originally set at 1.0% of taxable earnings. It has been increased several times since then and is currently set at 1.5% of taxable income. It has also been subject to 'one-off' surcharges from time to time to cover non-health initiatives of the Australian Government.

From October 1997, a surcharge of 1.0% has been levied on high-income earners without private insurance cover for hospital care.

Funding by state and territory and local governments

The bulk of the funding from this combined source comes from the state and territory governments. The contribution by local governments is confined to some high-level residential aged care homes and public and community health services.

State and territory governments also make health-specific payments to local governments, and these are included in the estimates of funding by the state or territory governments concerned. Likewise, Commonwealth payments to the state and territory

governments for health are regarded as funding by the Australian Government and are not included as funding by state and territory governments.

Nationally, most funding by state, territory and local governments was directed to services in public hospitals ($8.1 billion or 54.5% in 2001–02). In addition, a large proportion of the capital expenditure funded by state and local governments would be in respect of public hospital facilities (Table S.44).

State and territory governments fund a range of health goods and services from their own resources. In addition to their joint funding of public hospital services, states and territories incur expenditure in regulating other health services that operate within their borders, and providing or purchasing ambulance, dental and community health services. They provide most of the funding for these types of services and are a major funding source for public health activities in Australia.

Funding by non-government sources

The main non-government funding sources are out-of-pocket expenditure by individuals and benefits paid by private health insurance. Other non-government sources include providers of compulsory motor vehicle third party insurance and workers' compensation insurance.

In 2001–02 out-of-pocket payments totalled $12.5 billion, or 60% of all non-government health funding. Private health insurance funds contributed $4.9 billion (23%), and a further $3.6 billion (17%) came from other sources, such as the compulsory motor vehicle third party and workers' compensation insurers and private funders of capital.

Real growth in funding, by sources of funds

Over the longer period (1991–92 to 2001–02) funding by governments has generally grown more rapidly than non-government funding. But in recent years (1999–00 to 2001–02) non-government funding growth (7.5% per year) has outstripped growth in expenditure by both the Commonwealth (6.1%) and states and territories (4.4%) (Table 5.12).

States and territories are responsible for funding in areas with relatively lower growth rates than those for which the Australian Government provides most of the funding. For example, a large share of funding by states and territories is directed to public hospitals. Total expenditure on public hospitals between 1991–92 and 2001–02 grew in real terms at an average of 3.0% a year (3.3% for public (non-psychiatric) hospitals and −5.9% for public (psychiatric) hospitals (Table S.45)). On the other hand, expenditure on medical services and pharmaceuticals, for which the Commonwealth provides most of the funding, experienced real average growth of 3.8%, and 9.4% per year, respectively, over that same period.

Influence of Commonwealth–state health service funding agreements

Commonwealth and state and territory funding for public hospitals and some related state health services has, during the life of Medicare, been governed by a series of five-year agreements between the Commonwealth and each of the states and territories (see Box 5.4 for details). These have had an important influence on both the overall level of expenditure on health in Australia and on the contributions made by the different sources to the funding of health services.

Table 5.12: Funding of health, constant prices[(a)], and annual growth rates, 1991–92 to 2001–02

	Government							
	Australian Government[(b)]		State/territory and local		Non-government[(b)]		Total	
Year	Amount ($m)	Growth (%)	Amount ($m)	Growth (%)	Amount ($m)	Growth (%)	Amount ($m)	Growth (%)
1991–92	16,722	. .	9,531	. .	14,749	. .	41,002	. .
1992–93	17,982	7.5	9,486	–0.5	15,626	5.9	43,093	5.1
1993–94	19,139	6.4	8,993	–5.2	16,285	4.2	44,417	3.1
1994–95	19,886	3.9	9,526	5.9	16,650	2.2	46,062	3.7
1995–96	21,090	6.1	10,260	7.7	16,671	0.1	48,021	4.3
1996–97	21,665	2.7	11,369	10.8	17,328	3.9	50,362	4.9
1997–98	23,259	7.4	12,339	8.5	16,682	–3.7	52,280	3.8
1998–99	25,027	7.6	12,370	0.2	17,236	3.3	54,632	4.5
1999–00	26,978	7.8	13,269	7.3	17,564	1.9	57,810	5.8
2000–01	28,734	6.5	13,751	3.6	18,412	4.8	60,897	5.3
2001–02[(c)]	29,799	3.7	14,449	5.1	20,281	10.2	64,529	6.0
Average annual growth rates								
1992–93 to 1997–98		5.3		5.4		1.3		3.9
1997–98 to 2001–02		6.4		4.0		5.0		5.4
1991–92 to 1999–00		6.2		4.2		2.2		4.4
1999–00 to 2001–02		6.1		4.4		7.5		5.7
1991–92 to 2001–02		5.9		4.2		3.2		4.6

. . Not applicable.

(a) See Box 5.2 for explanation of constant price estimating method.

(b) Australian Government and non-government sector funding adjusted for tax expenditures (see Table S.42).

(c) Based on preliminary AIHW and ABS estimates.

Note: Some components may not add to totals due to rounding.

Source: AIHW Health Expenditure Database.

Box 5.2: Commonwealth–state health funding agreement periods

First Medicare (Compensation) Agreement: 1984 to June 1988

Second Medicare Agreement: 1 July 1988 to 30 June 1993

Third Medicare Agreement: 1 July 1993 to 30 June 1998

First Australian Health Care Agreement: 1 July 1998 to June 2003

Second Australian Health Care Agreement: 1 July 2003 to 30 June 2008

The agreements influence the relative shares of funding for total health provided by the different levels of government in particular years. In the first year following the signing of a set of agreements, the Commonwealth's share of funding tends to increase. Over the remainder of the agreements period, Commonwealth funding declines as the states and territories increase their funding share.

This trend is masked in the agreements period 1998–2003, primarily because of the Commonwealth's 30% health insurance premium rebate, which has helped to maintain the Commonwealth's share of funding. Consequently, in the fourth year of the agreements, 2001–02, the Commonwealth's share of funding (46.3%) was marginally higher than in the first year, 1998–99 (Table 5.11).

Box 5.5: Treatment of 30% rebate on private health insurance premiums in expenditure estimates

When individuals purchase private health insurance, they are charged periodic premiums (per month, quarter, year etc.). These premiums enable the private health insurers to fund their liabilities with respect of approved health expenditure incurred by people with insurance cover.

The Private Health Insurance Incentives Act (1997) *introduced a means-tested subsidy aimed at helping low-to-middle income earners obtain private health insurance cover. This was replaced, in January 1999, by a 30% premium rebate that is payable to anyone with private health insurance cover. The rebate, like the subsidy it replaced, may be claimed as a reduced health insurance premium or as a tax rebate. As such, the rebate reduces the price of private health insurance and is not directly related to potential benefits liability of the funds in respect of those members. At the same time, the revenues flowing into the funds are maintained at a level considered necessary to meet the emerging liabilities of the funds.*

The gross premiums charged by funds (including the subsidy or rebate) are based on a community rating principle. As such, the premiums can vary between funds given the actual and potential benefit liabilities of the entire fund but not between the individual members on the basis of individual risk.

Before 1997 all health benefits paid out of the funds, plus the cost of administering the funds, were regarded as health funding by health insurance funds.

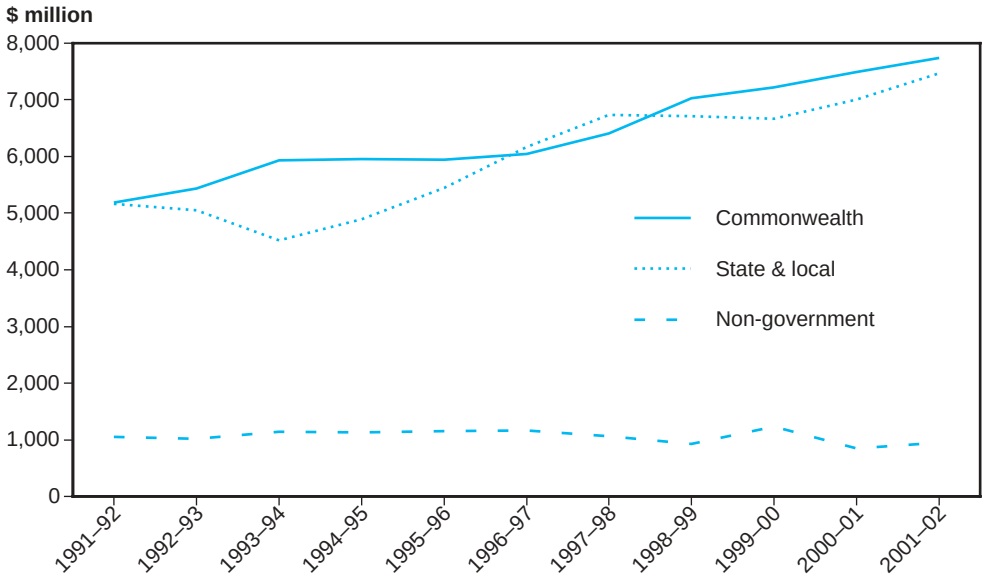
The introduction of the Private Health Insurance Incentives Subsidy (PHIIS) and its replacement premium rebate meant that part of the revenue used by the funds to pay for the health benefits and administration is provided by the Australian Government. In this way, the Commonwealth shares with the funds the funding of part of the charges raised by service providers.

In this report, the 30% rebate on premiums is allocated across all the expenses incurred by the funds each year (benefit payments related to health goods and services, benefit payments for non-health goods and services, management expenses, and adjustment to provisions for outstanding and future potential claims). However, only that proportion of the rebate that can be attributed to benefits for health goods and services and to management expenses is included as funding for health by the Australian Government. This same amount is deducted from the gross benefits and management expenses paid by the health insurance funds in the calculation of health funding by private health insurance.

Funding of hospitals

The discussion below examines the changes in the funding for hospitals over the latest three completed health care agreement periods (i.e. from July 1988 to the end of June 2001, the latest year for which comprehensive data are available). In this discussion, funding by the Australian Government includes funding provided outside the Commonwealth–State agreements (for example, funding by DVA for services provided to eligible veterans and their dependants).

The funding shares of the different levels of government have tended to follow the same patterns as described previously in relation to total health funding, with rises and falls depending on proximity to the beginning of an agreement period (Figure 5.5). In most years since 1991–92, funding for hospitals provided by the Commonwealth was greater than that provided by states and territories.



Source: AIHW 2003a.

Figure 5.5: Expenditure on public (non-psychiatric) hospitals, constant prices, 1991–92 to 2001–02

From 1997–98 to 1998–99 (that is, from the end of one agreements period to the beginning of the next), the Commonwealth's share of funding for hospitals increased, from 38.2% to 42.0% (Table 5.13). This was due partly to the new agreements and partly to the effect of the 30% rebate on private health insurance premiums on funding shares for private hospitals. The Commonwealth's share of funding continued to increase over the life of that particular agreements period. This was largely due to changes in the private health insurance arrangements (see Box 5.6) and was mostly felt through the funding of private hospitals.

Table 5.13: Shares of recurrent expenditure on hospitals, current prices, 1988–89 to 2001–02 (per cent)

	Government				
Year	Australian Government	State/territory and local	Total	Non-government	Total
1988-89	37.0	41.2	78.1	21.9	100.0
1991–92	36.2	39.3	75.6	24.4	100.0
1992–93	37.5	37.7	75.2	24.8	101.0
1993–94	40.5	33.4	73.8	26.2	100.0
1995–96	37.7	35.7	73.4	26.6	100.0
1997–98	38.2	38.2	76.4	23.6	100.0
1998–99	42.0	36.9	78.8	21.2	100.0
1999–00	43.8	35.8	79.6	20.4	100.0
2000–01	45.0	34.9	80.0	20.0	100.0
2001–02[(a)]	44.0	36.4	80.4	19.6	100.0

(a) Based on preliminary AIHW and ABS estimates.

Note: Some components may not add to totals due to rounding.

Source: AIHW Health Expenditure Database.

The Australian Government's rebate on private health insurance premiums has been treated as an indirect subsidy to the different types of goods and services that receive funding through private health insurance (see Box 5.5). Because benefit payments for private hospital services comprise the main type of private health insurance expenditure, this treatment of the rebate has resulted in a marked apparent movement of funding for hospitals away from non-government sources to the Australian Government.

Funding of medical services

Most funding for medical expenditure is provided by the Commonwealth through Medicare benefits (Figure 5.4). The Commonwealth also provides other forms of support to private medical practices and these are included in the estimates of its funding for medical services. Yet another form of Commonwealth funding for medical services is that provided by the DVA for eligible veterans and their dependants.

Direct expenditure on medical services by state, territory and local governments is negligible.

Most non-government funding for medical services is through co-payments for services provided under Medicare. In 2000–01 these totalled $1,078 million. Health insurance funds provided $287 million and other non-government sources (mostly workers' compensation and compulsory motor vehicle third party insurers) contributed a further $492 million.

The Commonwealth's share of funding for medical services increased during the early 1990s—from 80.7% in 1991–92 to 82.8% in 1993–94 (Table 5.14). This is reflected in the fall in the share of funding being provided by individuals (11.7% to 9.9%), and occurred during a period of rapid growth in bulk-billing.

In 1991–92, 62.8% of medical services were bulk-billed and by 1993–94 this had risen to 68.1%. Although the bulk-billing rate continued to increase after 1993–94 to 1999–00, the annual increases were much lower than had been the case during that earlier period. In recent times, the bulk-billing rate declined (from 72.3% in 1999–00 to 70.4% in 2001–02). At the same time, the Commonwealth's share of funding also declined (from 82.3% to 81.0%).

Table 5.14: Shares of recurrent funding for medical services, current prices, and proportion of medical services bulk-billed, 1991–92 to 2001–02 (per cent)

		Non-government					
Year	Australian Government	Health insurance	Individuals	Other	Total	Total	Bulk-billing rate
1991–92	80.7	3.2	11.7	4.4	19.3	100.0	62.8
1992–93	81.6	3.2	10.8	4.5	18.4	100.0	65.1
1993–94	82.8	3.0	9.9	4.3	17.2	100.0	68.1
1994–95	82.4	2.9	9.6	5.0	17.6	100.0	69.6
1995–96	82.5	2.8	9.6	5.0	17.5	100.0	71.1
1996–97	81.9	2.8	10.0	5.3	18.1	100.0	71.8
1997–98	81.7	2.5	10.6	5.2	18.3	100.0	71.8
1998–99	81.7	2.2	10.8	5.3	18.3	100.0	72.0
1999–00	82.3	2.0	10.3	5.4	17.7	100.0	72.3
2000–01	81.9	2.8	10.5	4.8	18.1	100.0	71.4
2001–02[(a)]	81.0	3.7	10.7	4.6	19.0	100.0	70.4

(a) Based on preliminary AIHW and ABS estimates.

Source: AIHW Health Expenditure Database.

Private health insurance

All Australians are eligible to receive public hospital treatment at no direct personal cost. Private health insurers provide cover for people who choose to be treated by doctors of their choice in hospitals. They may also provide a range of other benefits to insured people (Box 5.6).

Total funding for health services through private health insurance (that is, total benefits paid both out of members' net premiums and the Commonwealth rebate—see Box 5.5 on page 5) in 2001–02 was $7,036 million (Table S.56). This was 10.6% of estimated $66,582 million in total expenditure on health in that year (Table S.44). Of the funding through health insurance, an estimated $2,110 million (30.0%) was funded from the Australian Government's 30% rebate.

This was the second year that the lifetime cover arrangements had been in operation (see Box 5.6). In the previous year, 2000–01 health funding through private insurance was $6,191 million (Table S.56), of which 30% rebate contributed $2,031 million. In the two years before the lifetime cover arrangements, 1998–99 and 1999–00, health funding through private insurance had been $4,843 million and $5,186 million, respectively (AIHW 2002a).

Box 5.6: Private health insurance arrangements

Since 1984, private health insurance funds in Australia have offered insurance cover for approved services provided in public and private hospitals. They also offer cover through ancillary tables for a range of non-hospital health and health-related services. There are four categories of health insurance membership – singles, couples without children, sole parents, and couples with children.

The funds can tailor their insurance products to meet particular needs of different groups of contributors. For example, they may offer tables that exclude benefits for obstetrics or hip replacements, which may be attractive to some groups of contributors. The premiums for such insurance reflect the particular exclusion(s) and are lower than for similar insurance that does not contain such exclusion(s). 'Front-end deductible' tables are also available. These allow contributors to meet a set amount of the charge for hospital care from their own pockets whilst paying a reduced premium.

Health insurance arrangements changed substantially on 1 July 2000, with the introduction of 'lifetime' health cover incentives. These encourage people to take out and retain private health insurance cover throughout their lives. From that date, people who join a health insurance fund before their thirtieth birthday and maintain their hospital cover pay lower premiums throughout their lives than someone who joins later in life. People over 30 years old who take out hospital cover pay a loading of 2% for each year that their entry age is over 30. Fund members who had hospital cover at 1 July 2000 and maintain it are exempt from the loading. People who were aged 65 years and over at 1 July 1999 are also exempt from the premium loading.

The net funding of health services by private health insurance (that is, not including the amount met from the premium rebate) increased from $4,160 million in 2000–01 to $4,926 million in 2001–02 (tables S.43 and S.44). In the last two years before lifetime cover, 1998–99 and 1999–00, net funding had been $3,886 million and $3,614 million, respectively (AIHW 2002a).

An influx of new members about the time the lifetime health cover arrangements were introduced in July 2000 (see Box 5.6), coupled with the statutory waiting periods for eligibility for benefits, meant that funds' net incomes during 2000–01 exceeded the net health-related benefits and administrative expenditure by $1.1 billion. Accordingly, combined operating profits, before abnormals and extraordinary items, of the funds in that year were much higher ($852 million) than in 1999–00 ($381 million). In 2001–02, health insurance funds had an operating loss,

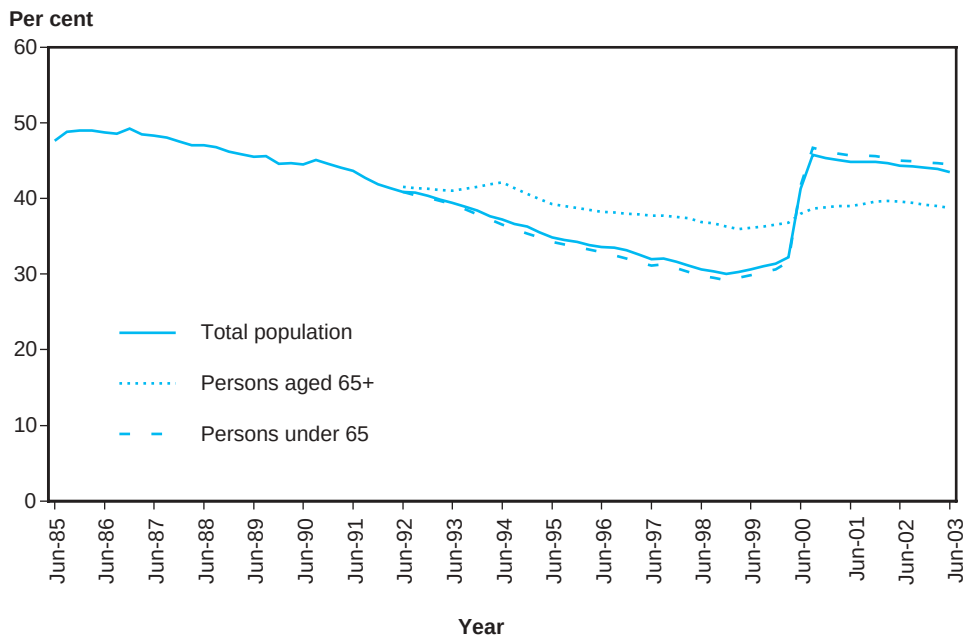
before abnormals and extraordinary items, of $32 million (Table S.56). Much of this turn-around was due to a large fall in other revenue—from $226 million in 2000–01 to $66 million in 2001–02.

In 2001–02, benefits paid for private hospital services accounted for $2,381 million, or 48.3% of the net health funding by private insurance funds (4,926 million). Dental benefits ($661 million, 13.4%) and administration ($511 million, 10.4%) were the next largest areas of funding by private insurance.

There was also a large increase in private health insurance funding for non-health ancillaries—such as funeral expenses, gym memberships, etc.—during 2001–02. These rose from a net $19 million in 2000–01 to $52 million in 2001–02.

Trends in private health insurance coverage, membership and premiums

At the end of June 2003, 8.6 million Australians or 43.5% of the population were covered by private health insurance (PHIAC 2003). This was down by 1.1 percentage points from 44.3% in June 2002 and represented an overall fall of 2.3 percentage points from the peak of 8.8 million (45.7%) at the end of the first quarter following the introduction of the lifetime cover arrangements in July 2000 (Figure 5.6).



Sources: OECD 2003, PHIAC 2001, PHIAC 2002 and PHIAC unpublished data.

Figure 5.6: Proportion of population covered by basic health insurance, 1985 to 2003

From 1985, when about 50% of the population had private health insurance cover, to December 1998, the general trend in coverage had been downward. At the end of December 1998, 30% of the population were covered by health insurance.

From December 1998 to September 2000 coverage grew each quarter. This was largely due to:

- the introduction, in October 1997, of a tax levy of 1% of taxable income for high income earners (single people with incomes over $50,000 and couples with incomes greater than $100,000) without insurance cover for hospital services;
- replacement of the Private Health Insurance Incentives Scheme by the non-means-tested 30% rebate on premiums in 1999; and
- the introduction of the 'lifetime health cover' arrangements (see Box 5.6).

This latest change exerted by far the greatest immediate influence on the level of coverage. Coverage increased from 32.3% in March 2000, a quarter before the deadline for joining a fund (1 July 2000), to 45.7% in September 2000, immediately after the deadline.

Since September 2000 there has been a consistent fall in the level of cover each quarter.

Expenditure on diseases

This section provides an overview of how health expenditure in Australia is distributed among specific disease and injury groups, and by age groups and sex. The estimates were derived using a method that ensures that they add across disease, age and sex groups to the total Australian health system expenditure for 2000-01 allocable by disease. They provide a useful description of the use and costs of health services in Australia, as well as a reference source for planners and researchers interested in costs and usage patterns for a particular disease group (AIHW 2004a).

It should be noted that expenditure on disease should not be used as a measure of the size of the disease burden on the community (i.e. as the 'size of the problem'). It does not equate to loss of health due to disease, nor to the priority for intervention. Neither should the estimates of disease expenditure be regarded as estimates of potential savings from prevention. Moreover, it should be emphasised that this analysis does not attempt to estimate the total economic impact of diseases in the Australian community. Not included are the costs that accrue to patients such as the cost of pain and suffering, travel costs of patients, the social and economic burden on carers and family, and lost quality and quantity of life.

The total health expenditure in Australia in 2000–01, summarised at the broad disease group level, is shown in Table 5.15. The disease cost estimates allocate around 86% of the recurrent health expenditure in 2000–01, or just over $49.1 billion in total. The remaining $11.7 billion of health expenditure which cannot be allocated by disease includes recurrent expenditure on community and public health services, health administration, the transport of patients, and health aids and appliances of $8.1 billion and capital expenditures of $3.6 billion.

Table 5.15: Diseases and injury by burden of disease chapter: health system costs by health sector, 2000–01 ($ million)

Burden of disease chapter	Hospitals[(a)]	Aged care homes[(b)]	Out-of-hospital medical services	Dental[(d)] and other professional services[(c) (e)]	Total pharma-ceuticals[(f)]	Research	Total expenditure allocated by disease	% of total allocated expenditure
Cardiovascular	2,533	526	782	78	1,411	153	5,484	11.2
Nervous system	1,115	2,168	573	410	468	204	4,878	9.9
Musculoskeletal	1,828	482	879	760	680	55	4,684	9.5
Injuries	2,830	105	622	284	184	6	4,031	8.2
Respiratory	1,437	88	840	64	1,189	35	3,654	7.4
Oral health	189	0	15	3,110	34	27	3,374	6.9
Mental disorders[(g)]	1,196	366	499	144	616	109	2,929	6.0
Digestive system	1,571	34	347	204	637	31	2,825	5.7
Neoplasms	1,988	37	258	24	183	215	2,705	5.5
Genitourinary	1,317	14	469	31	233	13	2,078	4.2
Endocrine, nutritional & metabolic	396	14	340	64	714	68	1,594	3.2
Skin diseases	562	13	341	103	344	13	1,376	2.8
Maternal conditions	1,178	0	107	10	9	11	1,315	2.7
Infectious & parasitic	478	8	366	27	209	139	1,226	2.5
Diabetes mellitus	289	38	183	36	234	35	814	1.7
Neonatal causes	334	0	12	0	1	11	358	0.7
Congenital anomalies	158	6	19	1	2	37	221	0.5
Signs, symptoms, ill-defined conditions and other contact with the health system[(h)]	2,633	0	1,802	174	996	21	5,626	11.4
Total	**22,030**	**3,899**	**8,454**	**5,524**	**8,085**	**1,182**	**49,174**	**100.0**
As percent of total	**44.8**	**7.9**	**17.2**	**11.2**	**16.4**	**2.4**	**100.0**	

(a) Public and private acute hospitals and psychiatric hospitals. Includes a preliminary estimate of private medical services provided in hospital.
(b) Includes expenditure on residents that require and receive a level of care that falls within one of the four highest levels in residential aged care services.
(c) Based on preliminary AIHW estimates.
(d) Expenditure on dental services was $3,084 million and is all included in the 'Oral health' category.
(e) Includes services delivered outside of hospitals by paramedical professionals such as physiotherapists, chiropractors, occupational therapists, audiologists, speech therapists, hydropaths, podiatrists, therapeutic and clinical massage therapists, clinical psychologists, dietitians and osteopaths.
(f) Includes all pharmaceuticals for which a prescription is needed, including private prescriptions and under-copayment prescriptions, and includes over-the-counter medicaments such as vitamins and minerals, patent medicines, first aid and wound care products, analgesics, feminine hygiene products, cold sore preparations and a number of complementary health products that are sold in both pharmacies and other retail outlets.
(g) Does not include expenditure on community mental health services (see p. 10).
(h) Signs, symptoms and ill-defined conditions' includes diagnostic and other services for signs, symptoms and ill-defined conditions where the cause of the problem is unknown. 'Other contact with the health system' includes fertility control, reproduction and development; elective plastic surgery; general prevention, screening and health examination; and treatment and aftercare for unspecified disease.

The seven disease groups that account for the greatest health expenditure in Australia are:

- Cardiovascular diseases—$5.5 billion (11.2% of total allocated health expenditure)
- Nervous system disorders—$4.9 billion (9.9%)
- Musculoskeletal diseases—$4.7 billion (9.5%)
- Injuries—$4.0 billion (8.2%)
- Respiratory diseases—$3.7 billion (7.4%)
- Oral health—$3.4 billion (6.9%)
- Mental disorders $3.0 billion (6.0%).

These seven conditions together account for $29 billion, or 59% of allocated health expenditure.

For 2000–01, cardiovascular disease was the most expensive group ($5.5 billion), and also accounted for 38% of deaths.

Nervous system disorders was the second most expensive group ($4.9 billion) and has increased markedly since 1993–94 due to significantly increased expenditure on aged care home care for people with dementia. Total expenditure for Alzheimer's and other dementias in 2000–01 was $2.2 billion.

The National Health Priority Areas (NHPAs) are cardiovascular health, cancer control, injury prevention and control, mental health, musculoskeletal conditions, diabetes mellitus and asthma.

Four of the seven NHPAs rank within the top seven conditions listed in Table 5.15—cardiovascular disease, musculoskeletal diseases, mental disorders and injury. The fifth, neoplasms (which includes cancer), ranks ninth ($2.7 billion, or 5.5% of allocated expenditure); and the sixth, diabetes, ranks fifteenth ($0.8 billion or 1.7% of allocated expenditure). Diabetes also is a cause of other diseases such as cardiovascular and renal diseases, so total health expenditure attributable to diabetes is greater than $0.8 billion. Asthma is the seventh NHPA. It is contained within the respiratory diseases group and accounts for $0.7 billion, or 1.4% of allocated health expenditure.

Different illnesses require different treatment modes (Figure 5.7). For cardiovascular diseases, injuries, neoplasms and mental disorders, expenditure in hospitals and aged care homes account for a relatively high proportion of total expenditure, reflecting these conditions' demand for labour-intensive health services. Pharmaceutical costs for asthma, diabetes, cardiovascular conditions and mental disorders constitute a significant part of the total cost of treating these diseases. For musculoskeletal diseases, medical and other professional services are a greater proportion of costs than for other diseases.

Health system expenditures allocated by disease are 26% higher for females than for males—$27.7 billion compared with $21.5 billion. Expenditure per person is $2,851 for females, which is 27% higher than the $2,247 for males. When maternal conditions are excluded, expenditure per person for females is 21% higher than for males. (Table 5.16 and Figure 5.8).

This remaining difference for females largely reflects the fact that there are more women than men in the older age groups, where expenditure is highest, and it is in this age group that expenditure in aged care homes is very high.

Expenditure per person is higher for females than males for disease groups such as the nervous system, musculoskeletal conditions and oral health. It is higher for males for the cardiovascular, cancer and injury groups (Table 5.16).

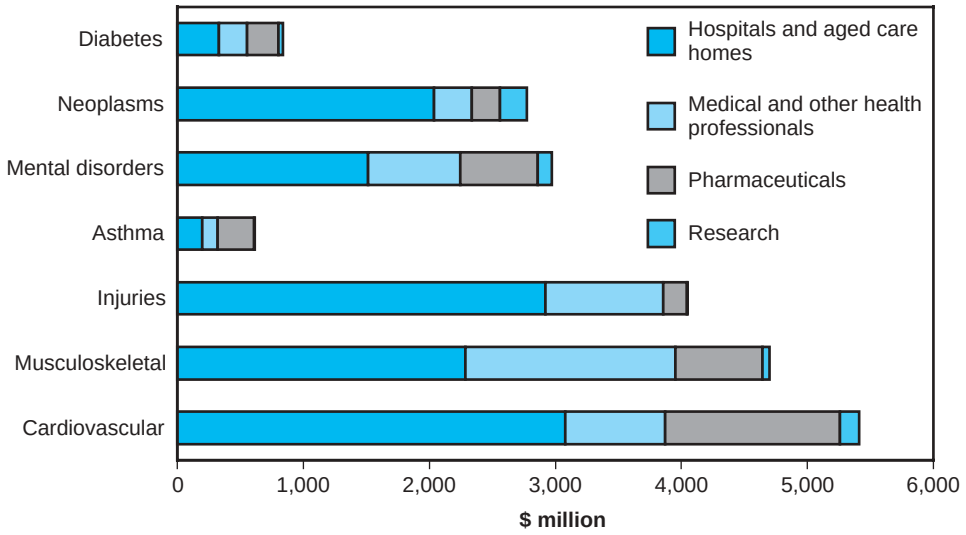


Figure 5.7: Total cost of disease, by health sector for NHPA, Australia, 2000–01

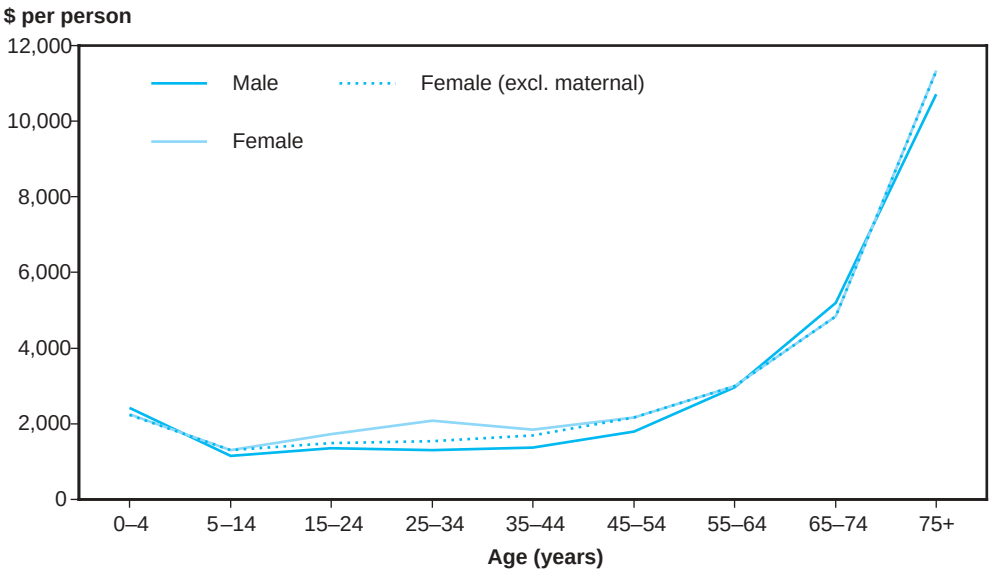


Figure 5.8: Allocated health expenditure per person by age and sex, Australia, 2000–01 ($ million)

Table 5.16: Allocated health expenditure per person by age, sex and burden of disease chapter, Australia, 2000–01

Selected burden of disease chapter and sex	Age (years)									
	0–4	5–14	15–24	25–34	35–44	45–54	55–64	65–74	75+	Total
Cardiovascular										
Male	13	7	17	36	96	262	620	1,302	2,040	297
Female	9	4	13	41	70	210	426	887	1,804	273
Neoplasms										
Male	25	12	18	25	43	120	277	641	984	146
Female	19	18	26	45	90	185	248	389	480	135
Musculoskeletal										
Male	24	42	85	158	190	245	359	504	738	207
Female	29	29	78	127	186	280	432	656	1,346	279
Nervous system										
Male	164	66	44	73	78	112	174	448	1,745	189
Female	118	57	64	81	85	130	176	506	2,897	316
Injuries										
Male	151	160	339	235	173	164	208	295	608	232
Female	101	132	137	120	126	146	165	299	750	187
Maternal conditions										
Female	0	1	236	535	150	2	0	0	0	135
Total										
Male	**1,876**	**1,091**	**1,271**	**1,230**	**1,402**	**1,915**	**3,179**	**5,657**	**9,924**	**2,247**
Female	**1,564**	**1,240**	**1,732**	**2,126**	**1,936**	**2,343**	**3,305**	**5,371**	**10,877**	**2,851**
Female (excl. maternal)	**1,564**	**1,240**	**1,497**	**1,591**	**1,786**	**2,342**	**3,305**	**5,371**	**10,877**	**2,716**

Health expenditure per person is $1,876 on average per year for males aged 0 to 4 years. It then decreases to $1,091 for boys aged 5 to 14 years and from there increases with age to $9,924 for men aged 75 years and over. For females, the pattern is the same for children, but in adulthood expenditure peaks in the 25–34 years age group, reflecting child-bearing expenditure; it then declines for the age range 35 to 44 years and from there increases steadily with age to $10,877 per year for women aged 75 years or over (Figure 5.8).

5.4 Health workforce

In a climate of rapid change over recent years, the present and future capability of the health workforce has come under question. Some of the factors contributing to this concern include: an ageing population; the emergence of new diseases, treatments and technologies; changing employment patterns; an increasing focus on rural and Indigenous health; trends in litigation; and the limited growth expected in the workforce, reflecting the low fertility rates of recent years.

According to the ABS Census, in 2001 there were 450,792 people in Australia who were employed in health occupations, but not all of these were working in health industries. For example, many safety inspectors work in government administration or the mining and

construction industries, and most pharmacists work in the retail industry. Moreover, there are many non-health occupations in health industries, such as managers, tradespeople, labourers, clerical and service workers, who provide infrastructure and support, as well as welfare professionals for whom there is some overlap with health workers. There is, however, considerable overlap in health occupations and industries (Figure 5.9). In this section, the health workforce refers mainly to paid workers in health occupations (outlined by the shaded boxes), although paid workers in health industries are also discussed briefly.

	Health services industry	Other industries	Total
Health occupations	356,088 employed persons e.g. doctors, nurses, dentists, allied health workers, ambulance officers, etc.	94,704 persons employed in health occupations in other industries e.g. retail pharmacists, safety inspectors, environmental health officers, etc.	450,792
Other occupations	201,693 persons employed in other occupations in health industries e.g. clerical workers, service workers, welfare professionals, etc.		
Total	557,781		

Note: Within the following discussion, the total number of people employed in health occupations differs between tables due to random adjustment of Census figures to protect the confidentiality of individuals, as well as the exclusion or inclusion of non-respondents.

Source: AIHW & ABS 2003.

Figure 5.9: The relationship of health occupations to the health services industries and other industries, 2001

Health workers

Of the 450,711 people employed in a health occupation in 2001, more than half (244,473 or 54%) were in nursing occupations (Table 5.17). Apart from other health workers (the broad occupation group comprising all the smaller occupations), medical workers and allied health workers formed the next largest occupation groups, at 11% and 9% of the total health workforce, respectively. Between 1996 and 2001 there was an overall growth of 12% in the number of health workers (AIHW and ABS 2003). There was growth in each of the broad occupation groups, the largest occurring for complementary therapy workers (30%) and the smallest for nursing workers (5%).

For every 100,000 people living in Australia in 2001, there were 2,322 health workers, an increase from 2,206 in 1996 (Table 5.17). The largest increases in rates occurred in Other health workers (up from 252 to 302 per 100,000 population in 1996 and 2001, respectively) and Allied health workers (up from 170 to 203). Nursing workers were the only broad occupation group in which the number of workers per 100,000 population decreased (down from 1,267 in 1996 to 1,259 in 2001).

Table 5.17: Persons employed in health occupation groups, numbers and rates, 1996 and 2001

Occupation	1996 Number	1996 Per 100,000 population	2001 Number	2001 Per 100,000 population	% growth 1996–2001
Medical workers	45,923	251	51,809	267	12.8
Medical imaging workers	6,524	36	8,111	42	24.3
Dental workers	23,306	127	25,853	133	10.9
Nursing workers	231,926	1,267	244,473	1,259	5.4
Pharmacy workers	12,305	67	13,902	72	13.0
Allied health workers	31,185	170	39,457	203	26.5
Complementary therapy workers	6,584	36	8,533	44	29.6
Other health workers	46,210	252	58,573	302	26.8
Total	**403,963**	**2,206**	**450,711**	**2,322**	**11.6**

Sources: AIHW 2001b; AIHW & ABS 2001.

Age and sex of people in health occupations

The health workforce, like the workforce in general, is ageing (see Box 5.7). The most rapidly ageing occupations (that is, those with the largest increases in the proportion of workers aged 45 years and over) were nursing (up from 32% to 42% between 1996 and 2001), medical imaging workers (up from 22% to 28%), dental workers (up from 21% to 26%) and medical workers (up from 41% to 46%).

Box 5.7: The ageing of the population and labour force

Between 1996 and 2001, Australia's population increased from 18.3 million to 19.4 million (up 6.0%) and the median age rose from 34 years to 35 years. The proportion of the population aged 65 years and over increased from 12.1% in 1996 to 12.6% in 2001 These trends are projected to continue, increasing the demand for health services.

In August 2001, there were an estimated 9,124,200 persons employed in Australia, of whom almost a third were approaching retirement age. The proportion of workers aged 45 years or more rose from 29.8% in 1996 to 32.8% in 2001. The health labour force is also ageing. Of the 450,711 people employed in health occupations, 38.6% were aged 45 years or more, a strong proportional increase over the 31.3% recorded in 1996. This proportion increased at a faster rate for females (from 29.0% to 37.1%) than for males (from 37.6% to 43.2%), reflecting the rapid ageing of the largest component – the female nursing labour force. The number of female nurses aged 45 years or over rose from 31.6% to 41.6% between 1996 and 2001.

A likely decline in the number of health workers as older workers retire, coupled with an increase in the number of older people in the population, places pressure on the capacity of the health labour force to provide care to all who need it.

Source: AIHW 2001b; AIHW & ABS 2003; ABS 2001a; ABS 1996 and 2001b.

In 2001, the broad occupational groups with the highest proportions of workers aged 45 years and over were medical workers (46%), complementary therapy workers (43%), pharmacy workers (42%) and nursing workers (41%) (Table 5.18). The broad occupation groups with the highest proportion of workers aged less than 35 years of age were dental workers (47%), medical imaging workers (44%) and allied health workers (42%). In almost all occupations the proportion of males aged 45 and over was higher than that for females. Conversely, in all occupations except nursing, the proportion of females aged over 35 exceeded that for males.

Table 5.18: Persons employed in health occupations: age and sex, 2001

		Age distribution (years)				
Occupation	**Sex**	**<35**	**35–44**	**45+**	**Total**	**Number**
			Per cent			
Medical workers	M	20.1	27.6	52.4	100.0	33,636
	F	33.3	34.0	32.8	100.0	18,173
	P	*24.7*	*29.8*	*45.5*	*100.0*	*51,809*
Medical imaging workers	M	43.1	30.2	26.7	100.0	2,501
	F	43.8	28.1	28.0	100.0	5,610
	P	*43.6*	*28.8*	*27.6*	*100.0*	*8,111*
Dental workers	M	23.7	29.2	47.1	100.0	8,641
	F	59.1	26.2	14.7	100.0	17,212
	P	*47.3*	*27.2*	*25.5*	*100.0*	*25,853*
Nursing workers	M	33.9	30.9	35.2	100.0	26,778
	F	26.4	32.0	41.6	100.0	217,695
	P	*27.2*	*31.9*	*40.9*	*100.0*	*244,473*
Pharmacy workers	M	27.3	20.0	52.7	100.0	6,685
	F	44.1	24.3	31.5	100.0	7,217
	P	*36.1*	*22.3*	*41.7*	*100.0*	*13,902*
Allied health workers	M	38.8	29.1	32.1	100.0	8,799
	F	42.5	26.7	30.9	100.0	30,658
	P	*41.6*	*27.2*	*31.2*	*100.0*	*39,457*
Complementary therapy workers	M	24.4	28.2	47.4	100.0	3,604
	F	31.5	28.9	39.6	100.0	4,929
	P	*28.5*	*28.6*	*42.9*	*100.0*	*8,533*
Other health workers	M	28.3	31.2	40.5	100.0	25,365
	F	40.5	30.2	29.3	100.0	33,208
	P	*35.2*	*30.6*	*34.2*	*100.0*	*58,573*
Total	**M**	**27.8**	**29.0**	**43.2**	**100.0**	**116,009**
	F	**32.1**	**30.9**	**37.1**	**100.0**	**334,702**
	P	***31.0***	***30.4***	***38.6***	***100.0***	***450,711***

M = males, F = females, P = persons.

Note: Components may not add to totals due to rounding.

Source: ABS Census of Population and Housing, 2001.

There were higher proportions of males than females in the oldest age bracket (45 years and over) and lower proportions of males than females aged less than 35 years in every broad occupational group except Nursing and Medical imaging workers (both with a majority of female workers). This is a reflection of increases over the last decade in the number of females graduating from tertiary institutions, particularly in less 'traditionally female' fields of study, and then entering the workforce. For example, 50% of these completing medical undergraduate degrees in 2001 were female compared with 41% in 1991. For dentistry, the corresponding rise was from 33% to 59%.

Box 5.8: Indigenous people in the health labour force

In the 2001 Census of Population and Housing, 3,742 people reported being Indigenous and employed in a health occupation (Table S.59). Of these, 1,916 (51%) were employed in nursing, with the largest category of these (789, or 41%) being registered nurses. The next most numerous occupation, Indigenous health workers (853, or 23%), was the only occupation in which the Indigenous people made up the majority of workers (93%). There were also 155 dental workers and 151 medical workers who reported that they were Indigenous in the 2001 Census.

Between 1996 and 2001, there was a large increase (up 28% or 186) in the number of Indigenous people working as Indigenous health workers (i.e. those working in the area of Indigenous health) and a relatively small overall increase (5% or 89) in nursing workers. In line with the changing structure of the nursing workforce in general, there were increases in Indigenous registered nurses (up 180) and personal care assistants (up 172), and a decrease in enrolled nurses (down 362).

The most popular health field of study for Indigenous students completing degrees in 2001 was nursing, with 73 students (Table 5.19). This was a rise of 18% from 1996. This rise occurred solely in the postgraduate level (from 8 postgraduate Indigenous students in 1996 to 25 in 2001, compared to a fall from 54 to 48 undergraduate Indigenous students).

With 58 completions, Indigenous health was also a popular field of study for Indigenous students in 2001.

Table 5.19: Indigenous students completing selected higher education courses in health, 1996 and 2001

Field	1996	2001
Nursing	62	73
Medical studies	6	8
Physiotherapy	1	5
Rehabilitation services—other	6	6
Radiography	—	3
Pharmacy	—	1
Indigenous health[(a)]	n.a.	58

— Nil.

n.a. Not available.

(a) Indigenous health was not available as a unique category in the 1996 'field' classification.

Note: The classifications for 'field' differed between 1996 and 2001. Those fields with a best match are presented here.

Source: AIHW analysis of Department of Education, Science and Training data.

Hours worked

Of the broad health occupation groups, medical workers stand out as the profession with the longest working week, with nearly half (47%) working 'long hours' (49 or more hours per week), far higher than any other broad occupational group (Table S.58). Among the

medical workers, specialist medical practitioners recorded the highest proportion working long hours (55%), slightly ahead of medical practitioners-in-training (53%).

Conversely, more than half (51%) of nursing workers worked part-time (under 35 hours per week), and most of the rest (another 37%) worked 40 hours or less. Over three-quarters of medical imaging workers (79%) and dental workers (77%) worked between 35 and 40 hours per week. This is a reflection of the high proportion of females in these three occupations (89%, 69% and 67%, for nurses, medical imaging workers and dental workers, respectively). Females are more likely to work part-time than males.

Within each of the broad occupational groups, there was considerable variation between the individual occupations. For example, medical administrators generally worked shorter hours than others in the medical workers group, but much longer hours than people in other health occupations. Similarly, directors of nursing/nursing managers worked much longer hours than other nursing workers, with 22% working 49 or more hours per week compared with 6% for all nursing workers (Table S.58). Also, a higher percentage of retail pharmacists worked 49 or more hours per week (27%) than other pharmacists (11%).

Between 1996 and 2001, the proportions of people in health occupations working part-time (less than 35 hours per week) and working long hours (49 hours or more per week) both increased. The net result was an overall decrease in the average hours worked from 30.9 to 30.8 per week (AIHW and ABS 2003). This decrease was more marked for doctors and nurses: AIHW labour force surveys show that total average weekly hours for medical practitioners decreased from 48.1 in 1996 to 45.4 in 2001, and that for nurses decreased from 32.3 in 1995 to 30.5 in 2001. When changes in the numbers of doctors and nurses, and population growth are also taken into account, the overall supply of doctors remained steady at 357 full-time equivalent (FTE) practitioners per 100,000 population in 1996 and 2001, while the supply of nurses dropped from 1,127 FTE per 100,000 in 1995 to 1,024 in both 1999 and 2001 (AIHW 2003b and AIHW 2003c).

Geographic distribution of health occupations and industries

Health occupations

The provision of health services outside the main population centres has been subject to increasing attention over recent years. Access to a wide range of health workers, particularly medical specialists, may be limited in more sparsely settled and remote areas.

The concentration of medical practitioners was much higher in Major cities (296 per 100,000 population) than in all other areas, with remote areas (108 per 100,000) having approximately one-third the rate of Major cities, and Very remote areas (73) having less than one-quarter (Table 5.20). However, it must be remembered that the work of many medical practitioners relies on the infrastructure and services of hospitals. These rates also do not capture those practitioners who make regular visits to regions outside of their place of residence. The AIHW medical labour force surveys show that primary care practitioners are more evenly spread, with 118, 92, 85, 76 and 81 per 100,000 in 2001, respectively, in Major cities, Inner regional, Outer regional, Remote and Very remote areas of Australia (AIHW 2003b).

The geographic spread of nursing professionals was more even than that of medical practitioners, although there was still considerable variation (ranging from 911 per 100,000 population in Inner regional areas down to 514 in Very remote areas). This was not the case with enrolled nurses, for whom the highest rate occurred in Outer regional areas (152 per 100,000 population), followed by Inner regional (141).

Table 5.20: Persons employed in selected health occupations per 100,000 population: remoteness areas (ASGC[(a)]), 2001

Occupation	Major cities	Inner regional	Outer regional	Remote	Very remote	Total[(b)]
			Number			
Medical practitioners	38,137	6,691	2,632	349	131	48,211
Nursing professionals	115,241	36,668	15,416	2,057	918	171,607
Enrolled nurses	10,050	5,671	3,067	440	127	19,496
Other health workers[(c)]	52,644	12,565	4,818	561	147	71,238
			Number per 100,000 population			
Medical practitioners	296	166	131	108	73	248
Nursing professionals	895	911	766	634	514	884
Enrolled nurses	78	141	152	136	71	100
Other health workers[(c)]	409	312	239	173	82	367

(a) Australian Standard Geographic Classification Remoteness Areas.

(b) Includes 2,222 people whose remoteness area was coded as 'Migratory/Not stated'.

(c) Includes dental practitioners, pharmacists, occupational therapists, optometrists, physiotherapists, speech pathologists, chiropractors/osteopaths and podiatrists.

Note: Components may not add to totals due to rounding.

Source: ABS Census of Population and Housing, 2001.

The rate of other health workers per 100,000 population decreased with increasing remoteness even more sharply than medical practitioners. There were 409 other health workers per 100,000 population in Major cities in 2001, steadily dropping with remoteness to 82 in Very remote areas (Table 5.20).

Health industries

As a rule, the rate of employees decreased with increasing remoteness for most health industries. For example, in 2001 there were almost twice as many workers per head of population employed in hospitals in Major cities than in Very remote areas (1,147 and 601 per 100,000 population, respectively) (Table 5.21). Small industries, in particular, were not as well represented in more remote regions. For example, in the optometry and optical dispensing industry, there were 53 workers per 100,000 population in Major cities, compared to 14 and 2 in Remote and Very remote areas, respectively.

Nevertheless, there were some notable exceptions to the rule. In particular, the rate of people employed in community health centres increased with remoteness (from 93 per 100,000 population in Major cities to 222 in Very remote areas) (Table 5.21).

Table 5.21: Persons employed in health industries per 100,000 population: remoteness areas (ASGC[(a)]), 2001

Industry	Major cities	Inner regional	Outer regional	Remote	Very remote	Total
Health services, undefined	216	260	258	307	320	234
Hospitals and nursing homes, undefined	8	11	11	15	11	9
Hospitals (except psychiatric hospitals)	1,147	995	891	816	601	1,085
Psychiatric hospitals	13	14	6	4	—	12
Nursing homes	334	380	322	144	71	338
Medical & dental services, undefined	14	9	8	5	3	12
General practice medical services	351	280	228	198	109	320
Specialist medical services	147	105	59	26	15	126
Dental services	168	127	104	71	35	151
Other health services, undefined	16	15	11	12	7	15
Pathology services	93	64	47	19	11	81
Optometry and optical dispensing	53	44	30	14	2	48
Ambulance services	37	59	54	56	31	44
Community health centres	93	103	105	165	222	100
Physiotherapy services	48	37	27	22	7	43
Chiropractic services	26	31	21	10	2	26
Health services, nec	242	195	133	92	53	218
Total health services	3,005	2,729	2,314	1,975	1,498	2,862

(a) Australian Standard Geographic Classification Remoteness Areas.

Note: Components may not add to totals due to rounding.

Source: AIHW & ABS 2003.

Specific health occupations

The Australian Institiute of Health and Welfare's periodic national health labour force surveys, conducted by the state and territory health departments in conjunction with relevant state and territory occupation registration boards, provide more specific information on various health occupations. For each occupation the most recent results available are presented in this section.

There are differences between the ABS Census of Population and Housing and the AIHW health labour force surveys in the number of workers reported in each of the professional groups. This is due to differences in the collection methods. The Census

tends to capture health professionals who are in clinical practice only, in the week of the Census—not those in administration, research or education. The AIHW health labour force surveys, on the other hand, count all registered workers, regardless of whether they are clinicians or non-clinicians, in each of the surveyed health professions.

The medical labour force

According to the Medical Labour Force Survey, there were 53,384 employed medical practitioners in 2001, an increase of 12.2% from 1996 (Table 5.22). The jurisdictions with the highest rates of practitioners in 2001 were the Australian Capital Territory, the Northern Territory and South Australia (354, 327 and 303 per 100,000 population, respectively). The rates increased in all jurisdictions between 1996 and 2001 except Queensland, where the rate decreased slightly from 235 to 233 per 100,000 population.

Table 5.22: Employed medical practitioners, states and territories, 1996 and 2001

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
					Number				
1996	16,885	11,972	7,852	4,151	4,244	1,117	913	439	47,573
2001	18,677	14,147	8,453	4,529	4,586	1,212	1,131	647	53,384
					Number per 100,000 population				
1996	272	263	235	235	288	235	296	241	260
2001	284	294	233	238	303	257	354	327	275

Note: Components may not add to totals due to rounding.

Source: AIHW Medical Labour Force surveys, 1996 and 2001.

The great majority (93%) of employed medical practitioners in 2001 were clinicians, of whom just under half (44%) were primary care practitioners and about a third (35%) were specialists (Table 5.23). Administrators and researchers made up a large proportion of the non-clinical workforce (32% and 26%, respectively), which also included teachers/educators, public health physicians and occupational health physicians.

Overall, in 2001 medical practitioners in Remote and Very remote areas were more likely to be younger than those in other regions, and they tended to work more hours per week. For example, they were, on average, 3 years younger and they worked longer by some 3 hours and 7.5 hours per week, respectively, than their colleagues in Major cities (Table 5.22). They were also more likely to be female (38% in Very remote areas, compared with 31% in Major cities).

For vocationally registered general practitioners the pattern was similar. Although they were older, on average, than other doctors in each region, their average age decreased with increasing remoteness (from 49.6 years in major cities to 43.8 years in very remote areas); and their average weekly hours, while lower than those of other doctors in each region, also increased with increasing remoteness (from 41.4 hours to 51.3 hours) (AIHW 2003b, unpublished data).

Table 5.23: Employed medical practitioners, by type of practitioner, remoteness areas (ASGC[(a)]), 2001

	Major cities	Inner regional	Outer regional	Remote	Very remote	Total[(b)]
Type of medical practitioner						
Clinicians	37,532	6,652	2,717	371	198	49,393
Primary care practitioners	15,170	3,706	1,718	248	145	21,671
Hospital non-specialists	3,872	669	231	56	39	5,169
Specialists	13,845	1,922	604	51	12	17,124
Specialists-in-training	4,646	355	165	16	2	5,429
Non-clinicians	3,387	285	132	30	4	3,991
Total	**40,919**	**6,937**	**2,849**	**401**	**203**	**53,384**
No. per 100,000 population	318	172	141	124	113	275
% female	31.3	26.3	29.7	36.0	37.6	30.7
Average age (years)[(c)]	46.1	46.4	45.5	43.0	42.6	46.1
Average hours worked per week	45.1	46.6	47.1	48.2	52.6	45.4

(a) Australian Standard Geographic Classification Remoteness Areas.

(b) Includes 2,075 medical practitioners who did not provide information on the location of their main job.

(c) Excludes Tasmania.

Source: AIHW Medical Labour Force Survey, 2001.

The nursing labour force

There were 228,230 employed nurses in 2001 (Table 5.24). Although this was an increase of 3.4% since 1995, the Australian population rose by 7% during this time. This resulted in a decrease of 45 in the rate of nurses per 100,000 population (from 1,221 in 1995 to 1,176 in 2001). Across the states and territories, only Queensland, the Australian Capital Territory and the Northern Territory recorded an increase in the rate of nurses from 1995 to 2001. Tasmania had the largest decrease, from 1,375 to 1,208.

The vast majority (80%) of employed nurses in 2001 were registered nurses, while the remaining nurses were enrolled (20%) (Table 5.24). The proportion of registered nurses increased by 2.5 percentage points since 1995, with Tasmania having the highest level in 2001 at 86% and Victoria the lowest level at 76%.

Table 5.24: Employed registered and enrolled nurses, states and territories, 1995 and 2001

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
					Number				
1995	67,545	63,942	35,069	21,435	20,981	6,511	3,338	1,846	220,667
2001	70,906	63,805	39,297	21,613	21,071	5,700	3,751	2,087	228,230
					Number per 100,000 population				
1995	1,102	1,415	1,074	1,236	1,428	1,375	1,095	1,040	1,221
2001	1,078	1,328	1,083	1,137	1,394	1,208	1,175	1,055	1,176
					% registered				
1995	81.7	72.7	80.9	75.2	75.5	82.8	83.5	85.0	77.8
2001	82.6	76.2	83.5	80.3	76.8	85.8	81.4	85.1	80.3

Source: AIHW Nursing Labour Force Surveys, 1995 and 2001.

Across geographic regions, the distribution of nurses closely matched that of the general population in 2001. The highest rate occurred in Inner regional areas (1,109 nurses per 100,000 population), while the lowest (959) was in Very remote areas.

Nursing is a mainly female occupation. In 2001, the great majority (92%) of nurses were female: a proportion that had been decreasing only slightly over the previous six years). This proportion ranged from 91% in Inner regional and Very remote areas to 95% in Remote areas. Remote areas had the lowest proportion of registered nurses (71%), while Major cities and Very remote areas had the highest (84% and 79%, respectively).

Both the average age of nurses and their average hours worked per week were fairly consistent across geographic regions. The average age of nurses ranged from 41.9 years in Major cities and Very remote areas to 43.0 years in Outer regional areas (Table 5.25). Similarly, the average hours worked per week by nurses was about 30 hours in all regions except Very remote areas, where it was 33 hours.

Table 5.25: Employed registered and enrolled nurses by remoteness areas (ASGC[(a)]) of main job, 2001

	Major cities	Inner regional	Outer regional	Remote	Very remote	Total[(b)]
Number	136,256	44,635	21,270	3,353	1,713	228,230
No. per 100,000 population	1,059	1,109	1,056	1,034	959	1,176
% female	91.6	91.2	94.2	94.9	91.2	91.6
% registered	83.7	75.4	71.2	70.6	78.7	80.3
Average age (years)	41.9	43.2	43.0	42.8	41.9	42.2
Average hours worked per week	30.7	30.1	30.1	30.0	33.3	30.5

(a) Australian Standard Geographic Classification Remoteness Areas.

(b) Includes 21,003 nurses who did not provide information on the location of their main job.

Source: AIHW Nursing Labour Force Survey, 2001.

The pharmacy labour force

In 1996, there were 13,834 employed pharmacists in Australia, providing a rate of 75.6 pharmacists per 100,000 population. From 1996 the number of pharmacists grew by 7% to 14,747 in 1999 and the rate grew to 77.9 (Table 5.26). The highest rates of pharmacists occurred in New South Wales (84.7 pharmacists per 100,000 population) and Tasmania (84.6). The Northern Territory had just over half these rates in 1999, at 43.1 pharmacists per 100,000 population. This can be entirely attributed to the very low rate of community pharmacists (24.9 per 100,000 population compared with the national rate of 62.5) rather than hospital/clinic pharmacists, for which the Northern Territory had the highest rate of all the jurisdictions (14.5).

The rate of pharmacists per 100,000 population increased between 1996 and 1999 in most jurisdictions except Queensland (down from 72.9 to 72.3) and the Australian Capital Territory (down from 86.3 to 83.2) (Table 5.26). In 1999, 47% of employed pharmacists were females, slightly higher than in 1996 (45%). The pharmacy labour force aged slightly between 1996 and 1999, from an average of 45.5 years to 46.1 years.

However, there was a considerable age difference between the sexes. Over 60% of females were aged under 45 years in 1999, compared with 35% for males, while 44% of males were aged 55 years or more compared with 16% of females.

Table 5.26: Employed pharmacists, states and territories, 1996 and 1999

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
					Number				
1996	4,936	3,587	2,433	1,224	959	355	266	73	13,834
1999	5,430	3,703	2,531	1,344	996	399	260	83	14,747
					Number per 100,000 population				
1996	79.6	78.7	72.9	69.3	65.0	74.8	86.3	40.1	75.6
1999									
Community pharmacists	69.1	60.8	61.4	59.2	52.7	65.8	49.0	24.9	62.5
Hospital/clinic pharmacists	10.2	13.6	9.1	10.2	11.1	12.7	13.1	14.5	11.1
Other pharmacists	5.4	4.6	1.8	3.2	2.6	6.2	21.1	3.6	4.4
All employed pharmacists	**84.7**	**79.0**	**72.3**	**72.7**	**66.5**	**84.6**	**83.2**	**43.1**	**77.9**

Note: Components may not add to totals due to rounding.

Source: AIHW Pharmacy Labour Force surveys, 1996 and 2001.

The dental labour force

The dental labour force is made up of dentists, dental therapists, dental hygienists and dental prosthetists. Information about dentists is collected annually from registration boards in each state and territory. However, states and territories do not uniformly register practitioners of other dental occupations and some of those occupations are not permitted to practise in some jurisdictions. Hence, information about dental occupations other than dentists is derived from a range of sources, including state/territory dental boards and questionnaires mailed directly to practitioners who are members of professional associations.

The distribution of practising dentists per 100,000 population varies widely across Australia. The highest rates in both 1994 and 2000 occurred in the Australian Capital Territory (57.5 and 59.3, respectively) and South Australia (49.7 and 54.8, respectively) (Table 5.27). The lowest rates in 1994 and 2000 occurred in Tasmania (25.2 and 25.3, respectively, which represented very little change). The largest increase between 1994 and 2000 in the rate of dentists occurred in Western Australia (from 39.7 to 48.5), while the rate in the Northern Territory fell (from 32.1 to 30.5).

In 2000, 23% of practising dentists were female, up from 18% in 1994. The average age of female dentists in 2000 was 38.2 years, while for males it was 46.2 years. Females worked on average 33.7 hours per week in 2000, while males worked 41.1 hours.

Dental therapists and prosthetists were more evenly spread among the states and territories than dentists were, with a few exceptions. Western Australia had a high number of dental therapists per 100,000 population, although there was a slight decrease between 1997 and 2000 (17.8 and 17.6, respectively), well above the national rates of 7.1 and 6.6 per 100,000 population in those years, respectively (Table 5.27). This was also the case for the rate of dental prosthetists in Tasmania in 2000 (11.1 per 100,000 population compared with 4.4 nationally).

The number of dental hygienists nationally is very small. In 2000, there were an estimated 398 dental hygienists across all states and territories except Tasmania. This was a rise of 74% from 1996 (up from 227 per 100,000 population), which can, in part, be attributed to the introduction of Western Australia into the collection in 1997.

Table 5.27: Employed dental labour force, states and territories, 1994, 1997, 1998 and 2000

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
				Number per 100,000 population					
Practising dentists									
1994	45.2	41.7	41.1	39.7	49.7	25.2	57.5	32.1	43.0
2000	48.4	46.3	43.9	48.5	54.8	25.3	59.3	30.5	46.9
Dental therapists									
1997	3.6	2.7	12.3	17.8	9.2	14.6	5.5	9.1	7.1
2000	3.3	2.9[(a)]	10.1	17.6	8.5	10.6	6.1	8.2	6.6
Dental prosthetists									
1998	4.4	5.0	3.5	2.9	1.7	11.2	3.9	. .[(b)]	4.2
2000	4.7	5.5[(a)]	3.3	3.2	1.8	11.1	5.1	. .[(b)]	4.4

. . Not applicable.

(a) Victoria was not included in the 2000 collection of dental therapists and prosthetists. Estimates were imputed.

(b) Dental prosthetists were not permitted to practise in the Northern Territory.

Source: AIHW Dental Labour Force surveys, 1994, 1997, 1998 and 2000.

The podiatry labour force

There were 2,011 employed podiatrists in Australia in 1999 (Table 5.28). This was an increase of 22% since 1994. The largest increases in the labour force between 1994 and 1999 were in South Australia (up 32%) and Queensland (up 26%).

Table 5.28: Employed podiatrists, states and territories, 1994 and 1999

Year	NSW	Vic	Qld	WA	SA	Tas	ACT	Total
				Number				
1994	456	590	196	169	185	57	n.a.	1,653
1999	566	667	247	194	245	63	29	2,011
				Number per 100,000 population				
1994	7.5	13.1	6.1	9.9	12.6	12.1	n.a.	9.3
1999	8.8	14.2	7.1	10.5	16.4	13.4	9.3	10.6

n.a. Not available.

Note: Podiatrists are not required to be registered in order to work in the Northern Territory, therefore podiatrists in that jurisdiction were not included in the Podiatry Labour Force surveys; this was also the case for the Australian Capital Territory in 1994.

Source: AIHW Podiatry Labour Force surveys, 1994 and 1999.

Nationally, there were 10.6 podiatrists for every 100,000 people in Australia (Table 5.28). The highest rate occurred in South Australia (16.4), while Queensland recorded the lowest (7.1).

Podiatry remained a mostly female field, but males made up a larger proportion (36%) of the labour force in 1999 than in 1994 (32%). The podiatry workforce is also relatively young, with just over half (51%) aged under 35 years. In 1999, the average age of male podiatrists was 36.9 years, which was younger than in 1994 (38.2 years). For females the average age was 37.7 years, which, in contrast to males, was older than in 1994 (33.3 years). The average age for all employed podiatrists in 1999 was 37.4 years.

The physiotherapy and occupational therapy labour forces

In 1998, there were 11,304 employed physiotherapists in Australia, representing about 60 per 100,000 population (Table 5.29). The rates for South Australia (74.4), Western Australia (71.9) and the Australian Capital Territory (68.4) were all above the national average (60.4), with Queensland and the Northern Territory having rates (52.2 and 43.2 respectively) that were well below the national average.

Physiotherapy is mainly a female field, with males making up less than a quarter (23%) of physiotherapists in 1998. The average age of employed physiotherapists was 38.6 years and they worked an average of 34.4 hours per week.

Table 5.29: Employed physiotherapists and occupational therapists, states and territories, 1998

Occupation	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
					Number				
Physiotherapists	3,844	2,688	1,799	1,311	1,108	259	212	82	11,304
Occupational therapists[(a)(b)]	n.a.	1,418	766	786	n.a.	n.a.	86	60	. .
					Number per 100,000 population				
Physiotherapists	60.6	58.0	52.2	71.9	74.4	54.9	68.4	43.2	60.4
Occupational therapists	. .	30.6	22.2	43.1	. .	. .	27.8	31.6	. .

. . Not applicable.

n.a. Not available.

(a) Occupational therapists are not required to be registered in order to work in New South Wales, Victoria, Tasmania and the Australian Capital Territory. With assistance from OT Australia, occupational therapists in Victoria and the Australian Capital Territory were able to be included in the Occupational Labour Force Survey in 1998. This survey was not conducted in South Australia.

(b) Includes occupational therapists on extended leave of three months or more.

Note: Components may not add to totals due to rounding.

Source: Physiotherapy and Occupational Therapy Labour Force surveys, 1998.

Occupational therapists provide support to a wide range of people with physical, psychological or developmental injuries or disabilities. The information presented here relates only to Queensland, Western Australia, the Northern Territory, Victoria and the Australian Capital Territory.

There were 3,116 occupational therapists employed in 1998 in Victoria, Queensland, Western Australia, the Australian Capital Territory, and the Northern Territory (Table 5.28). Of these jurisdictions, Western Australia had the highest number of therapists per 100,000 population (43.1) while Queensland had the lowest (22.2).

Occupational therapy had the highest proportion of female employees (95%) of all the health occupations surveyed. Male and female occupational therapists were virtually the same age on average (35.5 and 35.7 years, respectively). Males worked more hours per week on average than females (39.3 and 31.8 hours, respectively).

Entrants to the workforce

Higher education

In 2001, the highest number of students completing an undergraduate or postgraduate health-related course was in the field of nursing (8,216) (Table 5.30). This was, however, a fall of 19% from 1996 when there were 10,110 students who completed a nursing course. However, it is likely that the number completing courses at either the undergraduate or postgraduate level will start to increase in a few years' time: there was a sharp increase in the number commencing undergraduate medical courses between 2001 (8,051 students) and 2002 (8,803 students). Although the proportion of females who completed a nursing course remained stable at 90%, more students completed their nursing course at a postgraduate level in 2001 than in 1996 (from 20% in 1996 to 30% in 2001). This difference may be due, in part, to a change in the classification of the field of study in the intervening years.

The next largest field was medical studies. In 2001, 2,058 students completed an undergraduate or postgraduate course in medical studies, an increase of 18% from 1996 (Table 5.30). More female students completed a medical course in 2001 than male students, a reversal from 1996 (52% female in 2001 compared to 48% in 1996). Furthermore, the proportion of students completing medical studies who did so at the postgraduate level increased from 24% to 32% between 1996 and 2001.

Rehabilitation services in general had the largest percentage increases between 1996 and 2001 in the number of students completing courses. Speech pathology and audiology rose by more than half (59%, from 252 to 401), as did occupational therapy (51%, from 440 to 665), podiatry rose by a quarter (27%, from 114 to 145) and the remainder more than doubled (116%, from 299 to 646) (Table 5.30).

Table 5.30: Australian citizens/residents completing selected health-related higher education courses, sex and course level, 1996 and 2001

	1996			2001			% change
Field	**Number**	**% female**	**% undergrad**	**Number**	**% female**	**% undergrad**	**1996 to 2001**
Dentistry	303	49.8	89.4	339	54.9	81.1	11.9
Medical studies	1,743	47.7	76.1	2,058	52.2	67.7	18.1
Nursing	10,110	89.7	80.4	8,216	89.6	69.8	–18.7
Radiography	493	67.1	92.9	571	69.7	67.1	15.8
Nutrition and dietetics	229	84.7	27.1	248	89.5	51.2	8.3
Speech pathology/Audiology	252	92.5	81.7	401	94.0	80.5	59.1
Podiatry	114	57.0	80.7	145	57.9	93.8	27.2
Physiotherapy	681	61.4	77.7	784	60.1	80.9	15.1
Occupational therapy	440	88.6	89.1	665	90.2	88.4	51.1
Rehabilitation services—other	299	69.6	27.1	646	61.5	50.0	116.1
Optometry	184	60.3	89.1	172	59.9	58.1	–6.5
Pharmacy	536	60.8	82.3	682	63.2	88.3	27.2
Total	**15,384**	**80.1**	**79.0**	**14,927**	**78.4**	**71.1**	**–3.0**

Note: The classifications for 'field' differed between 1996 and 2001. Those fields with a best match are presented here.

Source: AIHW analyses of Department of Education, Science and Training data.

Migration

In 2001–02, 10,394 health professionals entered Australia and 8,122 left Australia for stays of 12 months or more (defined as long-term) (Table 5.31). This resulted in a net gain of 2,272 health professionals. Note, however, that these arrivals and departures are for all purposes, not just employment, and can therefore not be equated with additions to the health labour force. Also, they exclude short-term arrivals (of less than 12 months' duration), some of whom could temporarily work in the Australian health labour force.

Table 5.31: Migration of health professionals: overseas arrivals and departures, 2001–02

	Arrivals				Departures			
Occupation	Long-term residents	Permanent settlers	Long-term visitors	Total arrivals	Long-term residents	Permanent residents	Long-term visitors	Total departures
General medical practitioner	646	386	1,459	2,491	713	287	827	1,827
Specialist medical practitioner	72	73	178	323	79	21	58	158
Nurses (incl. midwives)	1,831	1,091	1,962	4,884	2,066	804	921	3,791
Dental practitioners	111	121	182	414	91	49	65	205
Pharmacists	171	164	211	546	171	58	126	355
Occupational therapists	156	42	48	246	231	53	26	310
Optometrists	76	83	105	264	96	48	99	243
Physiotherapists	299	116	149	564	404	85	91	580
Speech pathologists	57	13	16	86	79	13	10	102
Chiropractors/ osteopaths	51	10	26	87	51	24	12	87
Podiatrists	19	9	3	31	18	4	7	29
Medical imaging professionals	89	69	104	262	148	34	51	233
Other health professionals	92	51	53	196	109	44	49	202
Total	**3,670**	**2,228**	**4,496**	**10,394**	**4,256**	**1,524**	**2,342**	**8,122**

Note: This table includes all movements, regardless of the purpose (i.e. employment, holiday, etc.) but excludes short-term movements (i.e. less than 12 months).

Source: ABS, data available on request, Overseas Arrivals and Departures, Australia, July 2001 database.

The largest group of movements were nurses, with a total of 4,884 arrivals and 3,791 departures, a net gain of 1,093 (Table 5.31). Generalist medical practitioners formed the next largest group, with 2,491 arrivals and 1,827 departures, a net gain of 664.

In most occupations the total number of professionals arriving in Australia outnumbered those departing, but there were some occupations with a net loss in 2001–02. These were occupational therapists (246 arrivals and 310 departures), physiotherapists (564 arrivals and 580 departures) and speech pathologists (86 arrivals and 102 departures), as well as the miscellaneous group of 'other health professionals' (196 arrivals and 202 departures) (Table 5.31).

Overseas-trained medical practitioners who wish to have unconditional registration in any state or territory and who did not receive their initial qualifications from an accredited overseas medical school, are required to pass a series of exams and assessments conducted by the Australian Medical Council (AMC) or a relevant specialist college. While statistics on successful AMC applicants do not provide a complete picture of all the overseas-trained doctors who register each year, they can provide an indication.

There are two pathways for recognition of overseas medical qualification. For those doctors seeking registration as a specialist in Australia, they must apply to the relevant specialist college (through the AMC who administer the pathway). Due to the time required for recognition, it is difficult to report the number of successful applicants for each year. However, in the financial year 2001–02 there were 279 applications for specialist assessment made, an increase from 123 in 1997–98 (AMC 2002).

Overseas-trained practitioners applying for registration as a general practitioner or hospital non-specialist must apply for recognition through the general registration pathway. Applicants must pass a multiple choice questionnaire (MCQ) and clinical assessments. In the financial year 2001–02, 499 applicants passed the MCQ (out of a total of 884 applicants), while 319 applicants passed the two-stage clinical examination (out of a total of 619 applicants). This compares with 234 passing the MCQ and 151 passing the clinical assessments in 1997–98 (out of a total of 779 and 427 applicants, respectively) (AMC 2002).

Australian and international health workforces

Table 5.32 shows the number and rates per 1,000 population of workers in four key health professions in Australia and four other selected OECD countries, namely New Zealand, Canada, the United States of America and the United Kingdom.

Overall, the rates per 1,000 population varied somewhat across the five countries. Australia had higher rates than the other four countries for general practitioners and nurses, and was centrally placed for specialists and dentists.

Between 1996 and 2001, Australia recorded a fall in the rate of general practitioners and nurses, while the rates of specialists and dentists increased. There was also a decrease in the rate of nurses per 1,000 population in New Zealand (between 1996 and 2000) and Canada, and an increase in the United Kingdom. The United Kingdom recorded the highest increases in two out of the four occupations (medical specialists and nurses).

Table 5.32: Health professionals in selected OECD countries, number and rate[(a)], 1996 and 2001

Occupation/ year	Australia		New Zealand		Canada		USA		United Kingdom	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
General practitioners										
1996	25,089	1.4	2,935	0.8	29,805	1.0	189,431	0.7	35,922	0.6
2001	24,307	1.3	3,166[(b)]	0.8[(b)]	31,115	1.0	215,225[(c)]	0.8[(c)]	37,837	0.6
Medical specialists										
1996	20,209	1.1	2,319	0.6	32,033	1.1	358,597	1.3	78,284	1.3
2001	23,381	1.2	2,653[(b)]	0.7[(b)]	34,111	1.1	391,866[(c)]	1.4[(c)]	91,763	1.6
Dentists										
1996	8,000	0.4	1,364	0.4	15,819	0.5	160,400	0.6	22,928	0.4
2001	9,000	0.5	1,591[(b)]	0.4[(b)]	17,648	0.6	164,700[(c)]	0.6[(c)]	25,840	0.4
Nurses										
1996	197,500	10.8	36,303	9.7	307,209	10.4	2,161,700	8.0	475,000	8.2
2001	205,000	10.6	36,976[(b)]	9.6[(b)]	305,471[(b)]	9.9	2,271,300[(c)]	8.1[(c)]	530,000	9.0

(a) Number of workers per 1,000 population.

(b) 2000 figures.

(c) 1999 figures.

Source: OECD 2003.

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6 Health services

This chapter describes health services and their use in Australia. This material relates to the intervention component of the conceptual framework for Australia's health presented in Figure 1.1. The interventions covered in this chapter include those provided to individual patients by service providers such as hospitals and general practitioners (GPs), and those provided as public (population) health interventions.

6.1 Hospitals

Patients admitted to hospital

There were 6,398,171 separations of admitted patients from public acute, public psychiatric and private hospitals reported to the Australian Institute of Health and Welfare's (AIHW) National Hospital Morbidity Database for 2001–02 (Tables S30 and S31). This was a rate of 327 separations per 1,000 population (Table 6.1). There were 3,948,860 separations from public acute hospitals (62%), 16,652 separations from public psychiatric hospitals (0.3%) and 2,432,659 separations from private hospitals (which include private psychiatric hospitals and private free-standing day hospital facilities) (38%). These separations accounted for 23,201,186 patient days, 66% in public hospitals, 4% in public psychiatric hospitals and 30% in private hospitals (Tables S32 and S33).

Between 1997–98 and 2001–02, there was a 5.2% increase in separations from public acute hospitals and a 35.7% increase in separations from private hospitals (AIHW 2003a). There was a decrease of 0.5% in patient days for public acute hospitals over this period and an increase of 16.2% for private hospitals.

Box 6.1: Terms and data sources relating to the use of hospitals

Admitted patients

Statistics on admitted patients are compiled when an ***admitted patient*** *(a patient who undergoes a hospital's formal admission process) completes an episode of care and 'separates' from the hospital. This is because most of the data on the use of hospitals by admitted patients are based on information provided at the end of patients' episodes of care, rather than at the beginning. The length of stay and the procedures carried out are then known and the diagnostic information is more accurate.*

Separation *is the term used to refer to the episode of care, which can be a total hospital stay (from admission to discharge, transfer or death), or a portion of a hospital stay beginning or ending in a change of type of care (for example, from acute to rehabilitation). 'Separation' also means the process by which an admitted patient completes an episode of care by being discharged, dying, transferring to another hospital or changing type of care.*

(continued)

Box 6.1 *(continued)*: Terms and data sources relating to the use of hospitals

*For each separation, patients are assigned a **principal diagnosis**, which is the diagnosis established after study to be chiefly responsible for occasioning the patient's episode of admitted patient care. The principal diagnosis recorded for each separation is usually a disease, injury or poisoning, but can also be specific treatment of an already diagnosed condition, such as dialysis for renal disease, or other reasons for hospitalisation. If applicable, **procedures** are also reported. These can be surgical or non-surgical, and therapeutic or diagnostic. Diagnoses and procedures were reported using the second edition of the ICD-10-AM classification in 2001–02 (see Box 6.2). **Patient-day** means the occupancy of a hospital bed (or chair in the case of some same-day patients) by an admitted patient for all or part of a day.*

The state and territory health authorities compile information on patients admitted to hospitals and supply it to the AIHW for collation into the National Hospital Morbidity Database. This database is an electronic record for each separation from almost every hospital in Australia, including public acute and psychiatric hospitals (public sector), and private free-standing day hospital facilities and other private hospitals (private sector). Data are provided for all public hospital separations and about 95% of private hospital separations for most years.

As indicators of ill health, hospital separation data have limitations. Sick people who are not admitted to hospital are not counted and those who are admitted more than once are counted on each occasion. Hospital separation data are also affected by variations in admission practices, and in the availability of and access to hospitals.

Non-admitted patients

Hospitals provide services to non-admitted patients through emergency departments, outpatient clinics and a range of other specialised services. Summary information on these services is collated nationally for public hospitals by the AIHW and for private hospitals by the Australian Bureau of Statistics (ABS).

*An **occasion of service** for a non-admitted patient is defined as any examination, consultation, treatment or other service provided to a patient in each functional unit of a health service establishment each time the service is provided. National data are categorised into broad clinic- or service-based groupings.*

Definitions used for non-admitted patient hospital care are not completely uniform among the states and territories, and have varied over time. Existing national systems for counting and classifying this care are being revised with the aim of improving consistency and comparability. For example, collection of more detailed data on non-admitted patients registered for care in emergency departments began on 1 July 2003 in selected public hospitals.

After adjusting for changes in the age and size of the population, between 1997–98 and 2001–02 the number of separations per 1,000 population increased by 7.3% overall. The number of separations per 1,000 population fell by 1.2% for public acute hospitals, and increased by 25.6% for private hospitals (calculated from Table 6.1). The number of patient days per 1,000 population fell by 5.7% overall over the 4-year period and by 7.9% for public acute hospitals, but increased by 5.7% for private hospitals.

Table 6.1: Hospital use by admitted patients, 1997–98 to 2001–02

	1997–98	1998–99	1999–00	2000–01	2001–02
Separations per 1,000 population[(a)]					
Public hospitals	205.5	207.3	205.1	201.7	202.6
Public acute hospitals[(b)]	204.3	206.2	204.2	200.8	201.8
Public psychiatric hospitals	1.2	1.1	0.9	0.9	0.9
Private hospitals[(c)]	99.6	102.5	108.8	119.8	125.1
Private free-standing day hospital facilities	13.9	14.4	15.1	18.1	20.2
Other private hospitals	85.9	88.2	93.8	98.8	104.7
Total	**304.4**	**309.0**	**313.1**	**320.6**	**326.7**
Patient days per 1,000 population[(a)]					
Public hospitals	918.4	885.9	868.6	825.0	827.8
Public acute hospitals[(b)]	842.0	817.1	807.7	787.4	775.9
Public psychiatric hospitals	76.3	68.8	60.8	37.6	51.9
Private hospitals[(c)]	337.8	333.8	344.3	356.7	357.0
Private free-standing day hospital facilities	13.9	14.4	15.1	18.1	20.2
Other private hospitals	324.1	319.5	329.3	336.6	334.9
Total	**1,254.1**	**1,217.6**	**1,210.8**	**1,179.4**	**1,182.5**
Same-day separations as a percentage of total					
Public acute hospitals[(b)]	43.3	44.7	45.8	46.4	47.6
Private hospitals	53.1	54.8	56.1	58.5	60.0
Other private hospitals	45.6	47.6	49.2	51.6	52.8
Total[(d)]	46.3	47.9	49.2	50.8	**52.3**
Average length of stay (days)					
Public acute hospitals[(b)]	4.0	3.9	3.9	3.9	3.9
Private hospitals	3.3	3.2	3.1	3.0	2.9
Other private hospitals	3.7	3.6	3.5	3.3	3.2
Total[(d)]	**4.1**	**3.9**	**3.8**	**3.7**	**3.6**
Average length of stay, excluding same-day separations (days)					
Public acute hospitals[(b)]	6.4	6.3	6.4	6.4	6.5
Other private hospitals	6.0	5.9	5.9	5.8	5.7
Total[(d)]	**6.7**	**6.6**	**6.6**	**6.4**	**6.5**

(a) Figures are rates (per 1,000 population) directly age-standardised to the Australian population at 30 June 2001. For private hospitals, rates were derived using populations of the reporting states and territories only, without adjustment for incomplete reporting.

(b) Includes the Department of Veterans' Affairs hospitals for 1997–98.

(c) For 2000–01 and 2001–02 the hospital type was not specified for Tasmanian private hospitals, therefore data for Tasmania are included in the private hospitals total but not in the private hospital subcategories.

(d) Public psychiatric hospitals and private free-standing day hospital facilities included in these totals.

Source: AIHW 2003a.

Thus there was a shift from the use of public acute to private sector hospitals during the four-year period. In 1997–98, 67.4% of separations and 67.2% of patient days were in public acute hospitals, whereas in 2001–02 these proportions had fallen to 61.7% and 65.6% respectively. Within public acute hospitals, the proportion of patients admitted as public (Medicare) patients (see Box 6.3) remained relatively stable between 1997–98 (86.0%) and 2001–02 (86.2%).

The increase in separations for private hospitals was reflected in increases in the number of separations for a range of Australian Refined Diagnosis Related Groups (AR-DRGs) (see Box 6.2) for the private sector between 1999–00 and 2001–02 (AIHW 2003a). The AR-DRG with the greatest increase in separations was other colonoscopy, same-day for which an increase of 33,459 separations (24.6%) was reported. Other AR-DRGs for which relatively large increases were reported for the private sector were chemotherapy (an increase of 31,295 separations, 34.6%) and admit for renal dialysis (an increase of 26,353 separations, 42.2%).

Average length of stay

Although some categories of patients (such as those requiring rehabilitation, some specialised mental health services or palliative care) are not admitted for acute care services, most patients require a relatively short stay in hospital. There is an increasing trend towards day surgery and procedures for this group of patients, with improvements in medical technology (anaesthetics and microsurgery, for example) enabling a wider range of procedures to be performed on a same-day basis (Duckett 2002). Improved drug treatments and efforts to increase hospital productivity have also tended to result in decreased lengths of stay. Potentially increasing the average length of stay, however, some treatments that have previously been undertaken during short-stay admissions are not now included in these data as they are being provided in outpatient clinics and day care facilities or by community health services.

With public psychiatric hospitals excluded, the average length of stay was 3.6 days overall in 2001–02, 3.9 days in public acute hospitals and 2.9 days in private hospitals. Excluding same-day separations, the average length of stay was 6.5 days in public acute hospitals and 5.7 days in private hospitals.

The difference between public and private hospitals at least in part reflects the different range of patients cared for and treatments undertaken (casemix) in the two hospital sectors. For example, public hospitals had more children under the age of 5 years as patients (6.7% of separations) compared with private hospitals (2.3% of separations). As noted below, there were also differences in the area of usual residence of the patients, in the proportion of separations for which procedures were reported, in the average number of procedures reported per separation, in the range of AR-DRGs reported and in the AR-DRG-based average cost weights.

The average length of stay in hospital decreased from 4.1 days in 1997–98 to 3.6 days in 2001–02. The average length of stay excluding same-day separations also decreased, but less markedly, from 6.7 days in 1997–98 to 6.5 days in 2001–02. These figures are within the range of those reported for other OECD countries.

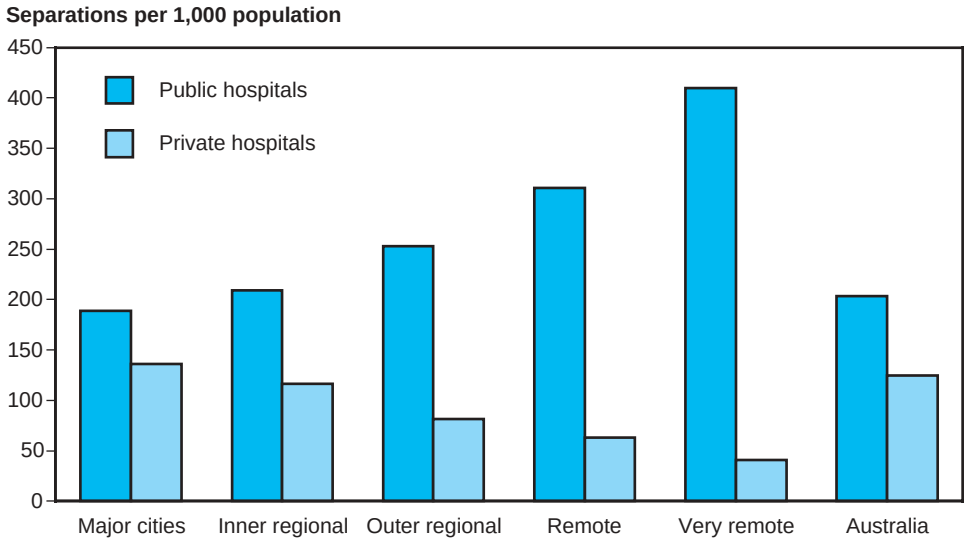
Same-day separations

In 2001–02, there were 3,348,846 same-day separations, 1,886,619 from public acute hospitals, 2,609 from public psychiatric hospitals and 1,459,618 from private hospitals (AIHW 2003a). There was a marked upward trend over the period 1997–98 to 2001–02 in the proportion of separations that were day-only. In 1997–98, 46.3% of separations were same-day separations, but by 2001–02 this had increased to 52.3% (Table 6.1).

Although the number of private free-standing day hospital facilities has increased markedly over recent years (from 140 in 1995–96 to 236 in 2001–02; Table 6.4), other private hospitals reported a greater increase in same-day separations between 1997–98 and 2001–02. The number of same-day separations increased by 52.9% to 1,048,668 for these hospitals (excluding Tasmania), compared with an increase of 51.0% to 372,737 for private free-standing day hospitals (excluding Tasmania). The number of same-day separations in public hospitals increased by 16.3% to 1,889,228.

Area of usual residence of the patients

In the public sector, the highest separation rates were reported for residents of very remote areas (410 separations per 1,000 population) (Figure 6.1). In the private sector, highest rates were reported for residents of major cities (136 separations per 1,000 population).



Note: Rates are age standardised to the 30 June 2001 Australian population.

Source: AIHW 2003a.

Figure 6.1: Separations per 1,000 population, by Remoteness Area of usual residence and hospital sector, 2001–02

Diagnoses, procedures and diagnosis-related groups for admitted patients

The conditions that hospitals treat are of interest to health service managers, planners, funders and epidemiologists. These conditions, the procedures that patients undergo in hospital and the consequent casemix of hospitals are detailed in the National Hospital Morbidity Database using the classification systems described in Box 6.2.

Principal diagnoses

For patients with a disease or injury recorded as a principal diagnosis (See Boxes 6.1 and 6.2), over half of all separations in Australian hospitals in 2001–02 had a principal diagnosis in five of the broad ICD-10-AM chapter groups. These were diseases of the digestive system; neoplasms; diseases of the circulatory system; injury and poisoning; and contact with health services (including dialysis, chemotherapy and rehabilitation) (Tables S34 and S35).

Box 6.2: Classification of diagnoses, procedures and separations for admitted patients

Diagnoses and procedures

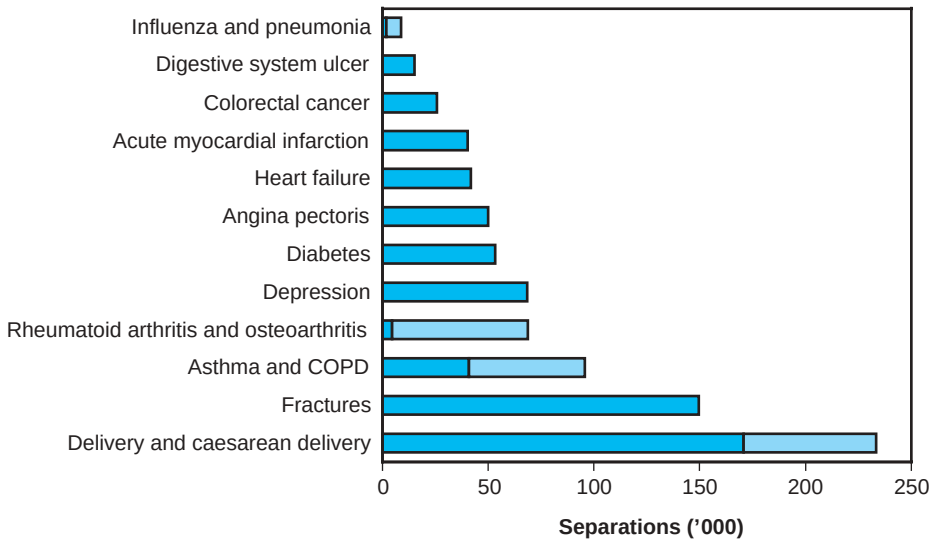
Hospital patient records contain information about a patient's diagnosis and about procedures performed during the hospital stay. To allow efficient storage and analysis of this information, detailed classification and coding systems are used to describe and record diagnoses and procedures. The classification used in 2001–02 in Australia was the second edition of the International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification (ICD-10-AM), developed by the National Centre for Classification in Health (NCCH 2000). It comprises classifications of diseases and external causes of injuries and poisoning, based on the World Health Organization version of ICD-10, and a classification of procedures based on the Australian Medicare Benefits Schedule. These ICD-10-AM codes can be a source of information on the diseases treated in hospitals and the operations performed, at very detailed levels or combined into broad groupings such as the ICD-10-AM chapters.

Diagnosis-related groups

Australian Refined Diagnosis Related Groups (AR-DRGs) is a classification system used mainly for acute care admitted patient episodes. This classification provides a means of summarising and relating the number and type of acute admitted patients treated in a hospital (that is, its casemix) to the resources expected to be used in their treatment. This classification groups episodes with similar clinical conditions and similar usage of hospital resources using information in the hospital separation record such as diagnoses, procedures, and age of the patient. This grouping is first to broad Major Diagnostic Categories, then to medical, surgical and other partitions and then to the AR-DRGs that they comprise.

Each AR-DRG is associated with information on the average length of stay and estimated average cost for patients in the group in the public and private sectors. This classification therefore has use in measuring outputs and performance of hospitals, and in planning and funding hospital service provision.

The National Health Priority Areas were represented in some high-volume diagnoses in 2001–02. There were 149,585 separations with a principal diagnosis of fracture, 95,774 separations with a principal diagnosis of asthma (40,918) (and 54,856 with a principal diagnosis of chronic obstructive pulmonary disease), 68,653 separations with a principal diagnosis of rheumatoid (4,609) or other (64,044) arthritis and 41,874 separations with a principal diagnosis of heart failure. Also of high volume were separations with a principal diagnosis of childbirth by caesarean section (62,663) or other delivery (170,799) (Figure 6.2).



(a) Bars with two categories of principal diagnosis are indicated using two shadings.

Note: COPD = Chronic obstructive pulmonary disease.

Source: AIHW 2003a.

Figure 6.2: Separations for selected principal diagnoses[(a)], Australian hospitals, 2001–02

Procedures

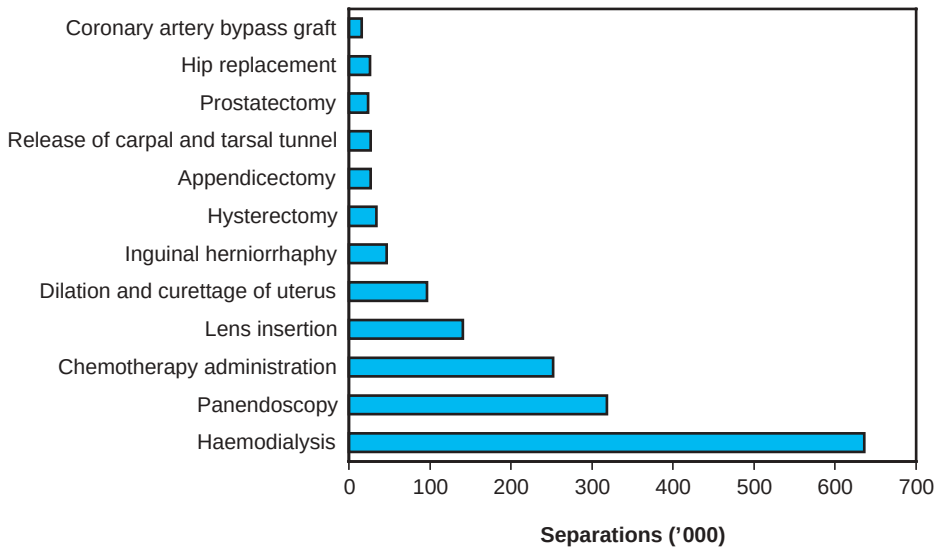
A procedure was reported for 79.1% of separations from Australian hospitals in 2001–02. Of these, 56.5% were in public hospitals, although public hospitals accounted for 62.0% of separations overall. Similarly, although 70.0% of overall patient days were in public hospitals, only 67.0% of patient days associated with procedures were in public hospitals. This reflects the higher proportion of separations in private hospitals (90.1%) that were reported with a procedure, compared to public hospitals (72.4%). An average of 1.7 procedures (excluding miscellaneous diagnostic and therapeutic procedures: procedures that are not 'operations' or obstetrical procedures) was reported for separations from public hospitals for which those procedures were reported. For private hospitals, there was an average of 1.6.

At the broad ICD-10-AM chapter level, if miscellaneous diagnostic and therapeutic procedures are not included, operations on the urinary system accounted for the largest

proportion of public hospital separations for which a procedure was reported (646,544 separations) (Table S36). Haemodialysis accounted for 84% (545,557) of these separations. The most commonly reported procedure group for the private sector was operations on the digestive system (635,074 separations) (Table S37). Within that grouping, panendoscopy with excision was reported for 32% of the separations, and fibreoptic colonoscopy with excision for 25%.

Other commonly reported procedures were chemotherapy administration (252,049 separations), lens insertion (140,449 separations), hip replacement (25,965 separations) and coronary artery bypass graft (16,120 separations) (Figure 6.3).

Some procedures are being increasingly undertaken in the private sector. For example, between 1993–94 and 2001–02 the number of separations for chemotherapy increased fivefold in the private sector and decreased by 2% in public hospitals. Thus, the proportion of separations for chemotherapy that was in private hospitals increased from 15% to 51% over this period. For haemodialysis, 8% of separations were in private hospitals in 1993–94 but, by 2001–02, this had risen to 14%.



Source: AIHW 2003a.

Figure 6.3: Separations for selected procedures, Australian hospitals, 2001–02

AR-DRGs

Using the AR-DRG classification of acute care separations (see Box 6.2), the Major Diagnostic Categories for which there were the most separations were kidney and urinary tract in public hospitals and digestive system in private hospitals (Tables S38 and S39). A total of 71.0% of separations in the public sector were for medical AR-DRGs (2,725,193), compared with 36.2% in the private sector (854,321). In contrast there was a larger proportion of separations for surgical AR-DRGs (40.6%, 959,489) in the private

sector than in the public sector (20.8%, 797,257). Overall, the average cost weight of separations (a summary measure of the relative resource intensity, based on the public sector cost estimates for each AR-DRG reported) was 0.99 for public acute hospitals and 0.91 for private hospitals (AIHW 2003a).

The AR-DRGs with the highest numbers of separations in 2001–02 featured several for which same-day separations dominated (Table 6.2). Among these were the top two groups in public hospitals, admit for renal dialysis (539,303 public sector separations) and chemotherapy (116,312 public sector separations); and the top two groups in the private sector, other colonoscopy, same-day (169,360 private sector separations) and chemotherapy (121,807 private sector separations). Vaginal delivery without complicating diagnosis was the most common AR-DRG that was not usually a same-day hospitalisation. This group was the third most common in public hospitals (96,714 separations) and the eleventh most common in private hospitals (36,462 separations).

Public hospitals reported separations for all AR-DRGs. Private hospitals reported separations for all but 7 of the 661 AR-DRGs: liver transplant, lung transplant, heart transplant, multiple organ transplants, extracorporeal membrane oxygenation without cardiac surgery, cardiothoracic/vascular procedures for neonates, and other HIV with catastrophic complications and comorbidities.

Table 6.2: Top 12 AR-DRGs version 4.2 with the highest number of separations, Australian hospitals, 2001–02[(a)]

AR-DRG		Separations	Same-day separations (per cent)	Patient days	Average length of stay (days)
L61Z	Admit for renal dialysis	628,110	99.9	628,374	1.0
R63Z	Chemotherapy	238,119	99.9	238,776	1.0
G44C	Other colonoscopy, same-day	231,356	100.0	231,356	1.0
G45B	Other gastroscopy for non-major digestive disease, same-day	152,265	100.0	152,265	1.0
O60D	Vaginal delivery without complicating diagnosis	133,176	3.0	438,916	3.3
C08Z	Major lens extraction	127,906	87.8	131,110	1.0
D40Z	Dental extractions and restorations	98,667	93.8	100,566	1.0
Z40Z	Follow-up after completed treatment with endoscopy	92,696	97.5	93,814	1.0
J11Z	Other skin, subcutaneous tissue and breast procedures	85,915	90.8	99,430	1.2
I18Z	Knee procedures	83,197	70.0	105,479	1.3
U60Z	Mental health treatment same-day without electroconvulsive therapy	81,685	100.0	81,685	1.0
O40Z	Abortion with dilatation and curettage, aspiration curettage or hysterotomy	68,924	87.9	71,536	1.0

(a) Separations for which the care type was reported as acute, or as newborn (with qualified patient days), or was not reported.

Source: AIHW 2003a.

AR-DRGs for veterans

Veterans receive admitted patient care in both public and private hospitals. In 2001–02, 327,927 separations for veterans were reported to the AIHW National Hospital Morbidity Database by state and territory governments, 131,613 in public hospitals and 196,314 in private hospitals. The most frequently reported AR-DRGs were admit for renal dialysis (19,781 in public hospitals and 11,253 in private hospitals), major lens procedures (1,421 and 14,543, respectively), and chemotherapy (3,103 and 9,723, respectively). Eligibility to receive hospital treatment as a Department of Veterans' Affairs (DVA) patient may not necessarily have been confirmed by the DVA for these separations.

Non-admitted hospital patients

There were 39,522,981 non-admitted patient occasions of service delivered to individuals through public acute hospitals in 2001–02 or about 2,036 per 1,000 population (AIHW 2003a). Of these, 5,754,666 or 15% were accident and emergency occasions of service, 5,775,085 (15%) were allied health services, and 5,770,193 (15%) were reported in a category of medical/surgical/obstetric services other than particular types such as radiology and organ imaging. In addition to the services provided to individuals, 444,409 services for groups of patients were delivered through public acute hospitals.

There is considerable variation in practices among states and territories in how data on non-admitted patient occasions of service are collected, and the extent to which these types of services are provided in non-hospital settings (such as community health centres), and this may affect the comparability of data on this type of hospital activity (see Box 6.1).

Private hospitals also provide non-admitted patient services, with a different mix of types compared with the public hospitals. In 2001–02, private hospitals reported 1,748,000 occasions of service (ABS 2003a), with the largest numbers reported for accident and emergency (478,000 or 27%) and allied health services (409,000 or 23%).

Table 6.3 presents data on the provision of accident and emergency non-admitted occasions of service in public hospitals by remoteness area of the hospital. The ratio of services provided in the area to the number of residents in the area is presented as an approximation of population use, though services provided in one area may be provided to persons residing in other remoteness areas. Nationally, the ratio varied from 236 per 1,000 population in major cities to 377 per 1,000 population in regional areas and 881 per 1,000 population in remote areas. The pattern of utilisation may reflect a number of factors including patterns of availability of other health care services, patterns of disease and injury, and the poor health of Indigenous people, who have higher population concentrations in remote areas.

There are also fewer accident and emergency non-admitted patient occasions of service per 1,000 population for private hospitals in regional and remote areas. The ratio of services provided to the population resident in the area ranged from 28 per 1,000 population in major cities to 20 per 1,000 population in regional areas and 7 per 1,000 population in remote areas in 2000–01 (AIHW 2003a).

Table 6.3: Accident and emergency non-admitted patient occasions of service in public acute hospitals, by remoteness area of hospital, states and territories, 2001–02

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Accident and emergency services									
Major cities	1,116,925	788,228	458,302	260,548	314,244	. .	94,763	. .	3,033,010
Inner regional	611,293	318,693	356,362	46,205	48,714	64,855	0	. .	1,446,122
Outer regional	227,056	103,274	265,525	101,840	69,731	28,082	. .	36,933	832,441
Total regional	*838,349*	*421,967*	*621,887*	*148,045*	*118,445*	*92,937*	*0*	*36,933*	*2,278,563*
Remote	33,199	0	79,070	91,626	24,209	6,372	. .	42,048	276,524
Very remote	14,965	. .	61,176	60,628	11,998	1,463	. .	16,339	166,569
Total remote	*48,164*	*0*	*140,246*	*152,254*	*36,207*	*7,835*	*. .*	*58,387*	*443,093*
Total	**2,003,438**	**1,210,195**	**1,220,435**	**560,847**	**468,896**	**100,772**	**94,763**	**95,320**	**5,754,666**
Ratio of accident and emergency services provided in area to 1,000 population resident in area[(a)]									
Major cities	238	223	241	194	290	. .	297	. .	236
Inner regional	453	313	380	199	260	216	0	. .	359
Outer regional	470	409	411	547	390	175	. .	346	413
Total regional	*458*	*332*	*393*	*354*	*324*	*202*	*0*	*346*	*377*
Remote	845	0	855	1,010	531	761	. .	1,003	853
Very remote	1,871	. .	1,160	1,228	812	560	. .	333	933
Total remote	*1,019*	*0*	*966*	*1,087*	*600*	*713*	*. .*	*642*	*881*
Total	305	252	336	295	310	214	297	482	296

. . Not applicable.

(a) The ratio of services provided in the area to the number of residents in the area only approximates population use as services provided in an area may be provided to persons residing in other remoteness area categories.

Source: AIHW 2003a.

Hospitals and bed numbers

In 2001–02, there were 724 public acute care hospitals and 301 private hospitals other than free-standing day hospital facilities, numbers not much changed over recent years (Table 6.4). Acute care hospitals provide at least minimal medical, surgical or obstetric services for admitted patient treatment and/or care, and provide 24-hour nursing service as well as other necessary professional services. Private hospitals in this category include acute care and psychiatric hospitals. In contrast, there was a marked change in the number of private free-standing day hospital facilities, with numbers increasing from 140 in 1995–96, to 236 in 2001–02. These facilities provide investigation and treatment services for admitted patients on a day-only basis.

The number of public psychiatric hospitals declined from 37 in 1993–94 to 23 in 1996–97 and has remained stable since then. These hospitals are devoted mainly to the treatment and care of admitted patients with psychiatric, mental or behavioural disorders. Reforms under the National Mental Health Strategy meant that their role declined in the early to mid-1990s, with more services provided in acute care hospitals and community settings.

Public acute hospitals can be described in terms of 'peer groups' (Table 6.6), based on their volume of admitted patient activity and geographical location (AIHW 2003a). This peer grouping was developed to explain variability in the average cost per casemix-adjusted separation and also demonstrate some of the attributes of the state and territory hospital systems arising from differing geographical characteristics, for example. Thus, Small hospitals had an average of 24 beds in 2001–02, and were most numerous in Queensland and New South Wales. Principal referral and specialist women's and children's hospitals averaged 419 beds each nationally.

Changes in the numbers of hospitals are often due to changes in administrative or reporting arrangements and not necessarily to changes in the number of hospital campuses or buildings. A more reliable indicator of the availability of hospital services may be numbers of hospital beds. However, the concept of an available bed is also becoming less important, for example in the light of increasing same day hospitalisations and provision of hospital in the home care. The comparability of bed numbers can also be affected by the casemix of hospitals with, for example, differing proportions of beds available for special and more general purposes.

Between 1995–96 and 2001–02, there was an 11% reduction in available beds per 1,000 population (Table 6.4). The change in beds per 1,000 population was not evenly distributed between the public and private sectors, with private sector beds increasing by 8% per 1,000 population and public sector beds decreasing by 19% per 1,000 population.

Table 6.4: Hospitals and available beds, 1995–96 to 2001–02

	1995–96	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02
Hospitals							
Public acute	704	706	736	728	726	726	724
Public psychiatric	34	23	24	21	22	23	22
Total public	*738*	*729*	*760*	*749*	*748*	*749*	*746*
Private free-standing day hospital facilities	140	153	175	175	190	207	236
Private other[(b)]	323	319	317	317	312	302	301
Total private	*463*	*472*	*492*	*492*	*502*	*509*	*537*
Total	1,201	1,199	1,250	1,241	1,250	1,258	1,283
Available beds (per 1,000 population)[(a)]							
Public acute	3.0	2.9	2.8	2.7	2.6	2.6	2.5
Public psychiatric	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Total public	*3.2*	*3.1*	*3.0*	*2.9*	*2.8*	*2.7*	*2.6*
Private free-standing day hospital facilities	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Private other[(b)]	1.3	1.2	1.2	1.3	1.2	1.3	1.3
Total private	*1.3*	*1.3*	*1.3*	*1.3*	*1.3*	*1.4*	*1.4*
Total	4.5	4.4	4.3	4.2	4.1	4.1	4.0

(a) Average available beds through the course of the year where possible, otherwise available beds at 30 June.

(b) Includes private acute and private psychiatric hospitals.

Source: AIHW 2003a.

In 2001–02, the average number of public hospital beds per 1,000 population ranged from 2.1 per 1,000 population in the Australian Capital Territory to 3.3 per 1,000 population in South Australia. For the private sector, there was a range from 1.1 beds per 1,000 population in the New South Wales to 1.7 beds per 1,000 population in Queensland (Table 6.5). The ratio of public beds per 1,000 population to private beds per 1,000 population was 1.9 nationally, ranging from 1.6 in Queensland to 2.4 in New South Wales.

Table 6.5: Available hospital beds per 1,000 population, states and territories, 2001–02

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Public acute hospitals	2.5	2.4	2.6	2.6	3.0	2.3	2.1	2.8	2.5
Public psychiatric hospitals	0.2	0.0	0.1	0.1	0.3	0.1	. .	. .	0.1
Total public	*2.6*	*2.4*	*2.7*	*2.7*	*3.3*	*2.3*	*2.1*	*2.8*	*2.6*
Private free-standing day hospital facilities	0.1	0.1	0.1	0.1	0.1	n.a.	n.a.	n.a.	0.1
Other private hospitals[(a)]	1.0	1.3	1.6	1.5	n.a.	n.a.	1.0	n.a.	1.3
Total private	*1.1*	*1.4*	*1.7*	*1.5*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*1.4*
Total available beds per 1,000 population	3.7	3.8	4.4	4.2	n.a.	n.a.	n.a.	n.a.	4.0

(a) Includes private acute and private psychiatric hospitals.

n.a. Not available but included in totals.

. . Not applicable.

Source: AIHW 2003a.

Hospital performance indicators

The National Health Performance Framework (NHPC 2002) includes nine dimensions that can be used to assess how well the health system is performing in delivering quality health actions to improve the health of Australians. For several of these dimensions, indicators that relate to the performance of the acute care or hospital component of the health system have been identified. They include:

- the cost per casemix-adjusted separation, as an indicator of efficiency
- waiting times for elective surgery, as an indicator of access
- emergency department waiting times, as an indicator of responsiveness
- hospital separations with an adverse event, as an indicator of safety.

The first three of these indicators are used for public acute hospitals and the last is applicable to all hospitals.

Cost per casemix-adjusted separation

The cost per casemix-adjusted separation is a measure of the average cost of providing care for an admitted patient, adjusted for the relative complexity of the patient's condition (AIHW 2003a). It is calculated for selected public acute care hospitals as the recurrent expenditure that is estimated to have been associated with treating admitted patients, divided by the total separations adjusted using AR-DRG cost weights for their relative costliness.

Table 6.6 presents cost per casemix-adjusted separation data by hospital peer group for 2001–02 (AIHW 2003a). Nationally, the average cost per casemix-adjusted separation was $3,006. The cost varied from $3,720 for the Australian Capital Territory, to $2,715 for Queensland, and from $3,147 for Small hospitals, to $2,787 for Large hospitals.

Table 6.6: Cost per casemix-adjusted separation, by public hospital peer group[(a)], 2001–02

Peer group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Principal referral and specialist women's & children's hospitals									
Number of hospitals	21	16	15	4	4	2	1	1	64
Average beds per hospital	369	531	353	508	431	382	498	297	419
Average cost weight	1.09	1.01	1.07	1.09	1.08	1.06	0.97	0.81	1.05
Cost per casemix-adjusted separation ($)	3,130	3,105	2,831	3,036	2,914	2,968	n.p.	n.p.	3,054
Large hospitals									
Number of hospitals	20	7	8	1	3	1	1	1	42
Average beds per hospital	152	115	150	105	201	131	162	153	147
Average cost weight	1.02	0.88	0.90	1.03	1.06	1.25	1.14	0.70	0.97
Cost per casemix-adjusted separation ($)	2,810	2,917	2,321	2,503	2,967	n.p.	n.p.	n.p.	2,787
Medium hospitals									
Number of hospitals	40	21	17	12	13	0	0	0	103
Average beds per hospital	55	54	59	106	57	. .	. .	. .	62
Average cost weight	0.92	0.79	0.79	0.82	0.84	. .	. .	. .	0.85
Cost per casemix-adjusted separation ($)	2,953	2,960	2,266	3,491	2,706	. .	. .	. .	2,941
Small hospitals									
Number of hospitals	36	19	38	20	15	3	0	3	134
Average beds per hospital	24	24	22	23	25	16	. .	37	24
Average cost weight	0.84	0.80	0.75	0.78	0.88	0.79	. .	0.70	0.80
Cost per casemix-adjusted separation ($)	3,125	3,351	2,865	3,542	2,553	3,506	. .	3,893	3,147
Total selected public acute care hospitals									
Number of hospitals	117	63	78	37	35	6	2	5	343
Average beds per hospital	118	173	107	105	98	157	330	112	124
Average cost weight	1.04	0.97	1.00	0.99	1.02	1.08	1.00	0.76	1.00
Cost per casemix-adjusted separation ($)	3,035	3,087	2,715	3,152	2,873	3,082	3,720	3,710	3,006

n.p. Not published because there was only one hospital in the peer group.

. . Not applicable.

(a) For details of the methods used see AIHW 2003a. Hospital counts refer to the lowest level of establishment with available financial data. As a result, the numbers of hospitals and beds will be different from those reported in Table 6.4.

Source: AIHW 2003a.

Waiting times for elective surgery

Waiting times for elective surgery are an indicator of access to hospital services; that is, an indicator of the provision of timely care according to need. Waiting times are the focus rather than waiting lists. This is because, without knowledge of the rate of turnover of patients on a waiting list, its size is not a reliable indicator of access to the hospital system or the amount of time that a patient waits for surgery. In 2001–02, the AIHW National Elective Surgery Waiting Times Data Collection included data for an estimated 84% of public hospital elective surgery admissions (AIHW 2003a). Data were not available for smaller hospitals in several states; these hospitals may not have had waiting lists or may have had different waiting list characteristics compared with reporting hospitals.

Overall, the median waiting time for elective surgery was 27 days in 2001–02 (Table 6.7), ranging from 23 days in Queensland to 40 days in the Australian Capital Territory. The shortest median waiting time was for patients admitted for their surgery in Principal referral and specialist women's and children's hospitals. The longest median waiting time was for patients admitted for their surgery in Large hospitals.

In the Principal referral and specialist women's and children's hospitals peer group, 4.2% of patients were admitted after waiting more than 12 months. In the Large hospitals peer group 5.0% of patients waited more than 12 months and in Medium hospitals 4.7% of patients waited more than 12 months. Overall, the proportion of patients admitted after waiting more than 12 months varied among the states and territories, ranging from 3.6% in Queensland and South Australia to 9.0% in Tasmania.

Emergency department waiting times

Emergency department waiting times are regarded as indicators of responsiveness of the acute care sector (NHPC 2002). This information is summarised as the proportions of patients who wait longer for care than is clinically appropriate in public hospital emergency departments, by triage category (Figure 6.4).

The triage category indicates the urgency of the patient's need for medical and nursing care. Triage nurses usually assign a category to patients when, or shortly after, the patient presents to the emergency department, in response to the question 'This patient should wait for medical care no longer than...?'. The National Triage Scale has five categories that incorporate the time by which the patient should receive care:

- Resuscitation: immediate (within seconds)
- Emergency: within 10 minutes
- Urgent: within 30 minutes
- Semi-urgent: within 60 minutes
- Non-urgent: within 120 minutes.

The comparability of the data between hospital peer groups may be influenced by variation in the coverage of the data collection (AIHW 2003a). Coverage was 97% of estimated emergency department visits for the Principal referral and specialist women's and children's hospitals peer group (labelled 'Principal referral hospitals' in Figure 6.4), 80% for Medium hospitals, 31% for Small hospitals and 64% overall.

Table 6.7: Patients admitted from waiting lists, by public hospital peer group, 2001–02

Peer group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Principal referral and women's & children's hospitals									
Number of admissions[(a)]	89,299	83,257	79,135	21,784	24,796	10,612	4,460	3,932	317,275
Estimated coverage (%)[(b)]	100	100	100	100	100	100	100	100	100
Days waited at 50th percentile	22	27	21	23	32	33	n.p.	n.p.	24
% waited more than 12 months	3.4	5.0	3.7	4.8	3.3	8.6	n.p.	n.p.	4.2
Large hospitals									
Number of admissions[(a)]	51,313	25,620	22,301	n.a.	9,881	2,447	3,566	1,754	116,882
Estimated coverage (%)[(b)]	100	60	100	0	100	100	100	100	84
Days waited at 50th percentile	34	29	27	n.a.	41	n.p.	n.p.	n.p.	33
% waited more than 12 months	6.6	2.4	3.4	n.a.	4.4	n.p.	n.p.	n.p.	5.0
Medium hospitals									
Number of admissions[(a)]	38,286	2,084	5,012	17,048	n.a.	. .	. .	. .	62,430
Estimated coverage (%)[(b)]	100	6	77	72	0	. .	. .	. .	53
Days waited at 50th percentile	35	n.p.	29	27	n.a.	. .	. .	. .	32
% waited more than 12 months	5.8	n.p.	1.4	3.3	n.a.	. .	. .	. .	4.7
Total[(c)]									
Number of admissions[(a)]	186,229	112,309	108,844	38,832	34,677	13,059	8,026	6,395	508,371
Estimated coverage (%)[(b)]	100	70	98	72	61	99	100	100	84
Days waited at 50th percentile	28	28	23	25	34	34	40	29	27
% waited more than 12 months	5.0	4.4	3.6	4.1	3.6	9.0	6.8	4.4	4.5

. . Not applicable.

n.a. Not available

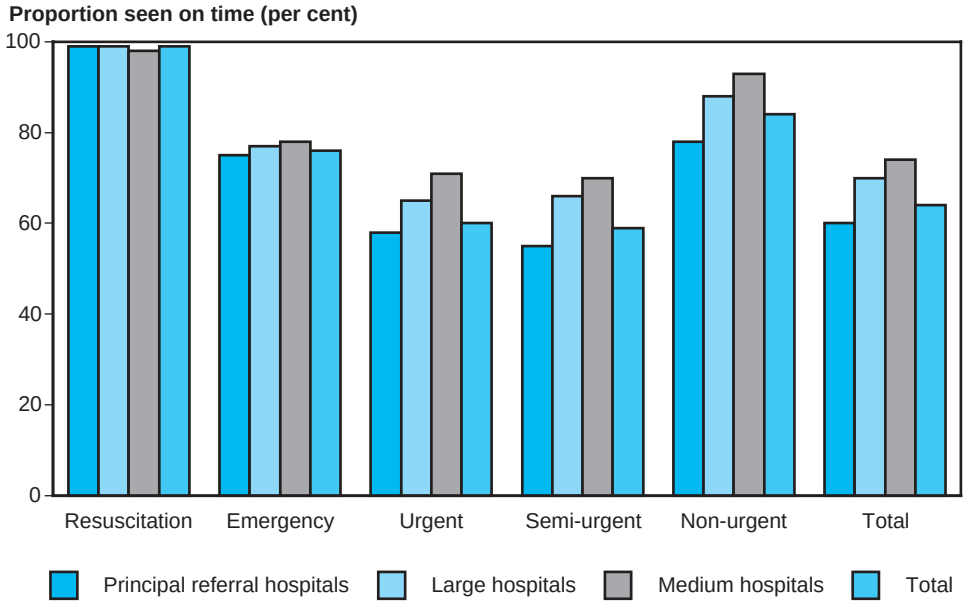
n.p. Not published because there was only one hospital in the peer group.

(a) Number of admissions for elective surgery reported to the AIHW National Elective Surgery Waiting Times Data Collection.

(b) Based on separations reported to the AIHW National Hospital Morbidity Database. See AIHW 2003a for more detail.

(c) Includes data for public hospitals not included in the specified hospital peer groups, and data for two private hospitals contracted to provide elective surgery in New South Wales.

Source: AIHW 2003a.



Source: AIHW 2003a.

Figure 6.4: Emergency department waiting time performance by triage category and public hospital peer group, 2001–02

The proportion of patients receiving care on time varied by triage category, from 99% for resuscitation patients to 59% for semi-urgent patients. Overall, the proportion of patients receiving emergency department care within the required time was 64%, varying from 60% in the Principal referral and specialist women's and children's hospitals peer group to 74% in the Medium hospitals peer group. For the non-urgent triage category, the proportion of patients seen on time was 84% overall, and ranged from 78% in the Principal referral and specialist women's and children's hospitals peer group to 93% in the Medium hospitals peer group.

Adverse events

Adverse events are defined as incidents in which harm resulted to a person receiving health care. They include infections, falls and other injuries, and medication and medical device problems, some of which may be preventable. The Australian Council for Safety and Quality in Health Care estimates that an adverse event is associated with about 10% of hospital separations in Australia and other developed countries (ACSQHC 2001). About 2% of separations are estimated to be associated with serious adverse events causing major disability (1.7%) or death (0.3%) (Runciman et al. 2000).

Data are not available to measure the number of adverse events in Australian hospitals accurately. However, hospital separations data can be used as an indication, as they include information on ICD-10-AM diagnoses and external causes of injury and

poisoning (see Box 6.2) that indicate that an adverse event was treated and/or occurred during the hospitalisation. Adverse events as recorded in hospital separations data have been used as an indicator of safety for the National Health Performance Framework (NHPC 2002).

In 2001–02, there were 264,950 separations reported to the AIHW National Hospital Morbidity Database that included an ICD-10-AM code for an adverse event, 4.1% of the total (Table 6.8). Included were 68,008 separations with adverse drug effects (when the drug had been used correctly), 7,510 with misadventures (such as an accidental cut, perforation or laceration during a surgical operation), 191,773 with a procedure such as a surgical operation described as the cause of a complication, and 147,700 with complications described as a diagnosis (including post-operative infections and haemorrhages).

Table 6.8: Hospital separations with an adverse event[(a)], 2001–02

	Separations with adverse events	Adverse event separations per 100 separations
Adverse drug effects	68,008	1.1
Misadventures	7,510	0.1
Procedures causing abnormal reactions/ complications	191,773	3.0
Diagnoses of complications of medical and surgical care	147,700	2.3
Total	**264,950**	**4.1**

(a) Other ICD-10-AM codes may also indicate that an adverse event occurred, and some adverse events are not identifiable using ICD-10-AM codes. Hence these data will underestimate the total number of adverse events. Categories do not sum to the totals, because multiple diagnoses and external causes can be recorded for each separation.

Source: AIHW National Hospital Morbidity Database.

Other ICD-10-AM codes may also indicate that an adverse event occurred, and some adverse events are not identifiable using ICD-10-AM codes. Hence, these data can be interpreted as representing selected adverse events in health care that have resulted in, or have affected, hospital admissions, rather than all adverse events that occurred in hospitals.

6.2 Private medical practice

The 2001–02 ABS survey of private medical practices and pathology businesses found that, at the end of June 2002, there were 19,464 medical practices (general practices and specialist medical practices) and 50 pathology laboratory businesses in Australia (ABS 2003b). Their key characteristics are described in this section, and information on the services they provide is presented in the sections on services funded by Medicare and the Department of Veterans' Affairs, general practice activity and private psychiatry services.

Medical practices were defined for the ABS survey as medical businesses, and any associated administrative service business. A medical business may be supported by an administrative service business used to manage the finances and secretarial activities of

the medical business. In that situation, the administrative service business and all medical businesses it supported were defined as a single medical practice. Medical businesses without administrative service businesses were treated as single-business medical practices.

There were 9,864 specialist practices in June 2002, with a total employment of 45,046 people at 16,585 locations. The specialties of surgery, internal medicine and psychiatry accounted for 61% of the practices, and surgery, diagnostic imaging and internal medicine accounted for 59% of the employment. The 9,864 specialist practices comprised 2,971 administrative service businesses (associated with 4,267 specialist medical businesses) and 6,893 specialist practices operating without an administrative service business. About 90% were single-practitioner practices. There was an increase in the number of specialist practices compared with the end of June 1995 (9,583) but a fall in employment (from 51,477).

Total income generated by specialist practices in 2001–02 was $5,911 million and total expenditure was $3,973 million. They had an operating profit before tax of $1,653 million, and an operating profit margin of 28.1%.

The 50 pathology laboratory businesses operated at 213 laboratory locations and 1,363 collection centres (some colocated with the laboratories). They employed 14,534 people, including 397 pathologists, 6,683 nurses/pathology collectors and 2,291 medical scientists/technologists. Total income in 2001–02 was $1,243 million and expenditure totalled $1,152 million. The operating profit before tax was $92.9 million, representing an operating profit margin of 7.5%.

There were 9,600 general practice businesses at the end of June 2002, incorporating 13,305 practices with a total employment of 56,911 people at 12,091 locations. There were 2,302 administrative service businesses (associated with 6,007 general practices) and 7,298 general practices operating without an administrative service business. About 69% were single-practitioner practices and about 6% had six or more practitioners. Businesses that included 10 or more medical businesses with an administrative service business (and could be regarded as a corporate general practice) operated at 211 locations.

The number of general practice businesses was lower in 2002 than at the end of June 1995 (10,349), possibly reflecting the corporatisation of general practices in recent years. Employment had grown from 54,657.

Total income generated by general practices in 2001–02 was $10,335 million and total expenditure was $3,146 million. They had an operating profit before tax of $1,107 million, and an operating profit margin of 26.4%.

Medicare-funded private medical services

Data on the operation of Medicare, Australia's system of universal health insurance, provide an overview of the use of private medical services (DoHA 2004). These include services provided outside hospitals as well as medical services for private patients in public and private hospitals. Note, however, that Medicare data do not provide a complete view of the use of private medical services (see Box 6.3).

Box 6.3: Medicare and Medicare benefits

***Medicare**, Australia's universal health insurance scheme, came into operation on 1 February 1984. Administered by the Health Insurance Commission (HIC), the scheme provides free or subsidised treatment by medical practitioners, participating optometrists and for certain services provided by other health professionals. All Australian residents are eligible for Medicare. Short-term visitors are not eligible unless they are covered by a reciprocal healthcare agreement and the services are of immediate medical necessity. Medicare is funded through taxation, which includes the Medicare levy (see Box 5.3).*

The term Medicare is also often used to refer to arrangements whereby people can access free public hospital outpatient and emergency department treatment, and admitted patient care as public (Medicare) patients in hospitals. These arrangements are agreed by the Australian Government and the state and territory governments under the Australian Health Care Agreements. Under them, doctors appointed by the hospitals provide medical care for public patients (at no cost to the patient). Patients who choose to be treated as private patients in public or private hospitals are liable for hospital accommodation and other charges, and for medical fees charged by private practitioners. Private health insurance can be purchased to cover these private hospitalisation costs (see Section 5.3 and Box 5.2).

The Pharmaceutical Benefits Scheme (see Box 6.5) can also be referred to as part of Medicare.

***Medicare benefits** provide financial assistance to people who incur medical expenses for selected professional services rendered by medical practitioners, participating optometrists and practice nurses, dentists and allied health professionals. A schedule of fees has been established, and Medicare benefits (the amounts paid by Medicare) are set as a proportion of those fees.*

Practitioners are not obliged to adhere to the schedule fees, except in the case of optometrists. However, if they direct-bill (bulk-bill) the HIC for any service rather than issuing patients with accounts, the amount payable then is the Medicare benefit, and additional charges cannot be raised for the service.

Some types of medical services do not qualify for Medicare benefits. These include services provided to entitled veterans and their dependants by the Department of Veterans' Affairs. Interim Medicare benefits may be paid for services for which claims may be lodged under motor vehicle third-party insurance and workers compensation schemes. These benefits are recovered by the HIC at the time when claims are settled. Other services which do not qualify for Medicare benefits include services provided by public authorities (including services to public patients in hospital) and most government-funded community health services, as well as services not necessary for patient care (such as examinations for employment purposes, cosmetic surgery and health screening services). To attract benefits, services must be 'clinically relevant', that is, reasonably required for the treatment of the patient's condition.

(continued)

Box 6.3 (*continued*): Medicare and Medicare benefits

For private patients who are admitted to hospitals or day-hospital facilities, the Medicare benefit is 75% of the schedule fee and the gap between the benefit and the schedule fee is insurable with private health insurance organisations. Amounts paid in excess of the schedule fee may be the subject of a private health insurance contract or no-gaps arrangement.

For non-hospital services, from 1 November 2003, the Medicare benefit is 85% of the schedule fee for schedule fees up to $390.70. For higher schedule fees, the Medicare benefit is the schedule fee less the maximum gap, which was $58.60 from 1 November 2003, and is indexed annually. The patient is responsible for the gap between the benefit paid and the fee charged, including amounts charged above the schedule fee.

General practitioners can claim an additional $5 for every bulk-billed service they provide to children under the age of 16 years and to Commonwealth concession card holders, and $7.50 for those categories of patients in regional, rural and remote Australia and in Tasmania.

A number of safety net arrangements apply in relation to non-hospital services. For Commonwealth concession card holders and families who receive Family Tax Benefit (A), once $300 has been paid as out-of-pocket expenses (the difference between the Medicare benefits and the amount charged by the doctor), Medicare covers 80% of the out-of-pocket costs (calculated in the same way) for the rest of the calendar year. For other families and individuals Medicare covers 80% of out-of-pocket costs after a threshold of $700 in a calendar year is reached. In addition, when gap amounts paid (the difference between the Medicare benefits and the schedule fees for services received) reach $328 per individual or family, Medicare benefits increase to up to 100% of the schedule fee for the remainder of the calendar year.

Medicare items cover a range of different services, from a single-doctor consultation to multiple pathology tests for a single patient episode, each of which is counted as a separate item. Consequently, it is not possible to directly compare different types of services based on the number of Medicare items. Also for this reason, the terms 'items' or 'items of service' are generally used when referring to Medicare services. The count of items is subject to changes in the bundling and unbundling of services so the count of items is not always completely comparable between years.

In 2002–03, Medicare provided benefits for 221.4 million services (Table 6.9). Non-referred (mainly GP) attendances accounted for 96.9 million services (43.8%) and pathology for 70.5 million (31.8%).

The 221.4 million services represented an increase of 0.3% over the 220.7 million services in 2001–02 and an increase of 3.5% over the 213.9 million in 2000–01. Item types that increased in number between 2000–01 and 2002–03 include those for pathology and assistance at operations, and there were decreases for non-referred attendances and obstetric items. The fall in the number of anaesthetic items recorded was affected by the introduction of the Relative Value Guide for anaesthetics in November 2001. This meant that episodes (rather than individual Medicare item numbers) were counted for anaesthetics.

Table 6.9: Medicare items processed, by broad type of service, 2000–01 to 2002–03

	Items per person				Items in 2002–03	
	2000–01	2001–02	2002–03	Average annual change (per cent)	Number	Per cent
Non-referred attendances[(a)]	5.22	5.12	4.90	–2.1	96,919,246	43.8
Specialist attendances	1.00	1.01	1.02	0.4	20,095,345	9.1
Obstetrics	0.08	0.08	0.07	–1.2	1,441,096	0.7
Anaesthetics	0.11	0.10	0.10	–3.1	1,913,847	0.9
Pathology	3.22	3.48	3.56	3.5	70,482,000	31.8
Diagnostic imaging	0.64	0.65	0.67	1.6	13,228,360	6.0
Operations	0.30	0.31	0.32	1.9	6,339,792	2.9
Assistance at operations	0.01	0.01	0.02	5.7	301,157	0.1
Optometry	0.22	0.23	0.23	1.6	4,572,650	2.1
Radiotherapy and therapeutic nuclear medicine	0.03	0.03	0.03	1.2	665,675	0.3
Other	0.26	0.27	0.28	1.9	5,447,016	2.5
Total	**11.10**	**11.30**	**11.19**	**0.3**	**221,406,184**	**100.0**
Pathology PEI items[(b)]	1.02	1.08	1.09	2.3	21,612,252	9.8
Total excluding pathology PEI items	**10.08**	**10.22**	**10.10**	**0.1**	**199,793,932**	**90.2**

(a) Includes GP attendances, emergency attendances, attendances after hours, other prolonged attendances, group therapy and acupuncture.

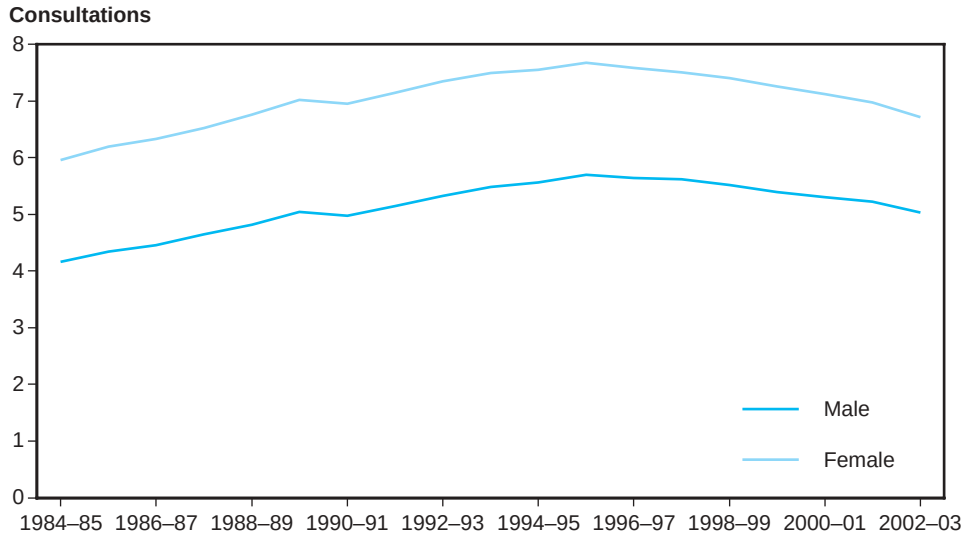
(b) Patient episode initiation items, covering the administrative costs associated with the collection of specimens.

Source: DoHA 2004.

In 2002–03, each person in Australia received, on average, 11.2 services under Medicare (or 10.1 services, if excluding pathology collection items that cover the administrative costs associated with collection of specimens for pathology). This was a decline of 1.0% compared with 2001–02 and an increase of 0.8% compared with 2000–01. In 2002–03, the services included an average of 4.9 non-referred attendances per person, 1.0 specialist attendance and 3.6 pathology services.

The number of services used per person varied considerably. For example, in 2002–03, approximately 3% of the population received 51 or more services each, and these accounted for 19.7% of total services and 22.2% of benefits paid. Between one and five services were received by approximately 34% of the population, and these accounted for 8.2% of services and 7.0% of the total benefits. No services were received by approximately 13% of the population (DoHA, unpublished data).

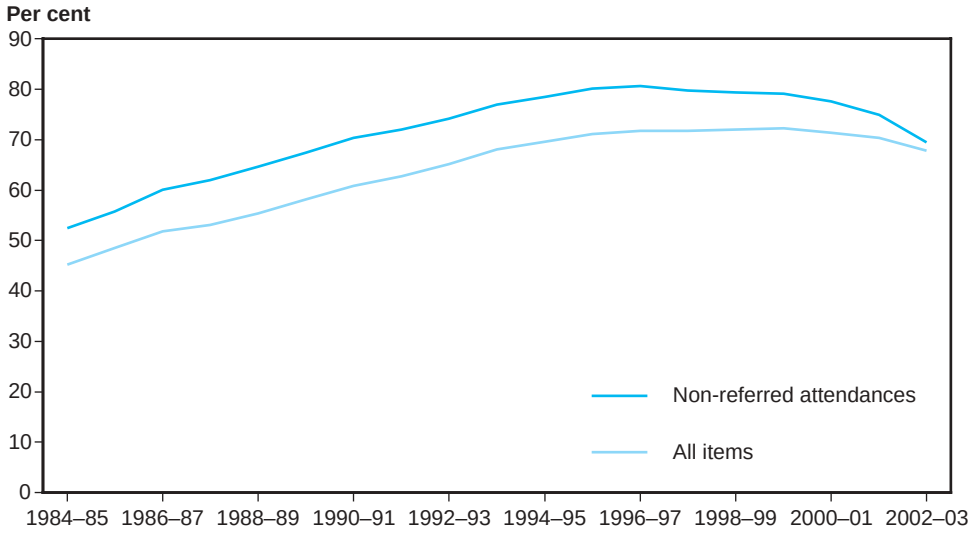
The average number of attendances with GPs and specialists per person per year increased steadily from 1984–85 to 1995–96, and has since declined (Figure 6.5). The data exclude obstetrics, pathology, radiology, anaesthetics, optometry and surgery. On an age-standardised basis, in 1984–85 males consulted a GP or specialist on average 4.2 times per year and the female population averaged 6.0 times per year. The peak was in 1995–96 (5.7 and 7.7, respectively) and in 2002–03 these rates were 5.0 and 6.7, respectively.



Note: Rates are age-standardised to the 2001 Australian population.

Source: DoHA 2004.

Figure 6.5: GP and specialist consultations per person, 1984–85 to 2002–03



Source: DoHA 2004.

Figure 6.6: Proportions of all Medicare items and non-referred attendance items that were bulk-billed, 1984–85 to 2002–03

Bulk-billing rates (for all items combined) increased from 45.2% in 1984–85 to a high of 72.3% in 1999–2000 and have been lower since then, to 70.4% in 2001–02, 67.8% in 2002–03 (Figure 6.6) and 67.9% in the quarter ending 31 March 2004. Bulk-billing rates for non-referred attendances increased from 52.5% in 1984–85 to a high of 80.6% in 1996–97. They were 74.9% in 2001–02, 69.5% in 2002–03 and 68.3% (excluding practice nurse services) in the quarter ending 31 March 2004.

Use of Medicare-funded services by state

The use of medical items varies among the states and territories. In 2002–03, the highest number of services (on an age-standardised basis) was recorded in New South Wales with 11.7 services per person. This was followed by Victoria (11.2) and South Australia (10.9). The Northern Territory recorded the lowest per person use of medical services with 7.5. This lower use in the Northern Territory is partly offset by services being provided to Aboriginal and Torres Strait Islander peoples through programs other than Medicare, and these services are not included in the data reported here.

DVA-funded medical services

The Department of Veterans' Affairs (DVA) funds medical services provided by local medical officers (GPs who are registered with DVA) and specialists for eligible veterans, war widows/widowers and their dependants. DVA issues each eligible veteran with a gold or white health card. The gold card is issued to veterans who are entitled to the full range of health care services funded by DVA. The white card provides access to the services for service-related conditions only.

There were 11,661,281 medical services funded by DVA in 2000–01, 11,919,510 in 2001–02, and 12,446,634 during 2002–03, increases of 2.2% and 4.4% respectively. Total expenditure was $634 million (DVA unpublished data).

The proportion of the eligible DVA population (335,160 as at 30 June 2003) using medical services was 94.7% in 2001–02 and 95.2% in 2002–03.

General practice activity

This section provides an overview of results from the fifth year of the BEACH (Bettering the Evaluation and Care of Health) program, a continuous study of general practice activity in Australia, and presents measures of changes in practice patterns from 1998–99 to 2002–03. The BEACH program provides insight into the patients and problems managed in general practice and how GPs manage a wide range of problems. From April 2002 to March 2003, inclusive, a random sample of 1,008 GPs from across Australia provided details of 100,800 GP-patient encounters (100,987 encounters, weighted by GP age-sex and GP activity) (AIHW: Britt et al. 2003).

The encounters

Most of the 100,987 encounters (98.4%) were direct (patient seen, face-to-face). The vast majority (95.0%) of these were claimable from Medicare or the DVA, and 82.9% were standard surgery consultations.

Of the encounters, 14% were with children aged less than 15 years, 10.1% were with young adults (15 to 24 years) and 24.2% with older adults (65 years and over). The patient was

female at 57.8% of encounters, held a Commonwealth Health Care card at 40.4%, and came from a non-English-speaking background at 10.6% of encounters. The patient identified themselves as an Aboriginal person or a Torres Strait Islander at 1.0% of encounters.

Box 6.4: The BEACH survey of general practice activity

The BEACH (Bettering the Evaluation and Care of Health) study is conducted by the General Practice Statistics and Classification Unit (an AIHW collaborating unit within the Family Medicine Research Centre, University of Sydney). BEACH began in April 1998 and each year about 1,000 GPs from a random sample participate, providing details of about 100,000 GP-patient encounters which represent the approximately one hundred million such encounters across the country each year. No information identifying patients is collected.

GPs who claimed at least 375 general practice Medicare items of service in the previous three months form the source population. This equates with 1,500 Medicare claims a year and ensures inclusion of the majority of part-time GPs while excluding those who are not in private practice but may claim for a few consultations a year. Each participating GP completes details of about 100 consecutive patient encounters on structured, paper encounter forms and provides information about themselves and their practice. Questions about selected patient health risk factors are asked of a subsample of patients.

For every 100 encounters there was an average 151 patient reasons for encounter (RFEs) recorded. The most common RFEs were those of a general and unspecified nature (22.9 per 100 encounters). Approximately half the RFEs related to the respiratory, musculoskeletal, skin, circulatory and digestive systems. The 20 most commonly recorded RFEs accounted for 48.1% of all RFEs. The need for a check-up was the most common RFE (13.6 per 100 encounters), followed by requests for medication (10.8). RFEs of a symptomatic nature, such as cough, were also commonly reported (Table 6.10).

Table 6.10: GP consultations: 20 most frequent patient reasons for encounter, 2002–03

Patient reason for encounter	Per cent of total RFEs	Rate per 100 encounters	Patient reason for encounter	Per cent of total RFEs	Rate per 100 encounters
Check-up	9.0	13.6	Headache	1.4	2.1
Prescription	7.1	10.8	Abdominal pain	1.3	1.9
Cough	4.5	6.7	Depression	1.3	1.9
Test results	3.6	5.4	Hypertension	1.2	1.8
Immunisation/vaccination	3.1	4.7	Nasal congestion/sneezing	1.2	1.7
Throat complaint	2.5	3.8	Ear pain	1.1	1.7
Back complaint	2.3	3.5	Diarrhoea	1.0	1.6
Rash	1.9	2.8	Weakness/tiredness	1.0	1.5
Fever	1.5	2.2	Administrative procedure	1.0	1.4
Upper respiratory tract infection	1.4	2.2	Knee complaint	0.9	1.3

Note: RFE—reason for encounter. Based on 152,341 RFEs at 100,987 encounters.

Source: AIHW: Britt et al. 2003.

The problems managed

Problems were managed at an average rate of 145 per 100 encounters. Those relating to the respiratory system, musculoskeletal system and skin accounted for almost 40% of all problems managed. The 20 problems most frequently managed accounted for 39.5% of all problems managed. The most common individual problems were hypertension (8.9 per 100 encounters), upper respiratory tract infection (6.4 per 100), immunisation/vaccination (4.6 per 100) and depression (3.5 per 100) (Table 6.11).

Table 6.11: GP consultations: 20 most frequently managed problems, 2002–03

Problem managed	Per cent of total problems	Rate per 100 encounters	Problem managed	Per cent of total problems	Rate per 100 encounters
Hypertension	6.1	8.9	Prescription	1.4	2.0
Upper respiratory tract infection	4.4	6.4	General check-up	1.3	1.9
Immunisation/vaccination	3.2	4.6	Contact dermatitis	1.3	1.9
Depression	2.4	3.5	Oesophageal disease	1.3	1.9
Lipid disorder	2.1	3.0	Female genital check-up/Pap smear	1.2	1.8
Diabetes (non-gestational)	2.0	2.9	Sprain/strain	1.2	1.7
Asthma	1.9	2.7	Urinary tract infection	1.2	1.7
Back complaint	1.8	2.6	Sleep disturbance	1.1	1.6
Acute bronchitis/bronchiolitis	1.8	2.6	Anxiety	1.1	1.6
Osteoarthritis	1.8	2.6	Menopausal complaint	1.0	1.5

Note: Based on 146,336 problems managed at 100,987 encounters.

Source: AIHW: Britt et al. 2003.

From 1998–99 to 2002–03, there were increased management rates of endocrine and metabolic problems, partly explained by increases in the management of lipid disorders and diabetes. There was a significant decrease in the management of respiratory problems, in particular asthma and acute bronchitis. There were also marginal decreases in the management of problems related to the ear, and to the blood and blood-forming organs.

Management

There was no specific treatment recorded for 8.7% of problems managed. The most common treatment was medication alone (33.8% of problems) followed by medication plus clinical treatments (12.1%) and then by clinical treatment alone (7.2%).

GPs undertook a total of 211,283 management activities in the 100,987 encounters, at a rate of 209 per 100 encounters and 144 per 100 problems. The most common management activity was medication prescribed, advised or supplied, at a rate of 103.8 per 100 encounters or 71.6 per 100 problems. Other treatments took place at the rate of 51.8 per 100 encounters, referrals at a rate of 11.1, pathology orders at a rate of 32.9 and imaging at a rate of 8.6 per 100 encounters (Table 6.12).

Table 6.12: GP consultations: management activities, 2002–03

Management type	Rate per 100 encounters	Rate per 100 problems
Medications	103.8	71.6
Prescribed	84.3	58.2
Advised for over-the-counter purchase	10.2	7.0
GP supplied	9.3	6.4
Other treatments	51.8	35.7
Clinical	37.2	25.7
Procedural	14.6	10.1
Referrals	11.1	7.7
Specialist	7.7	5.3
Allied health	2.5	1.7
Pathology	32.9	22.7
Imaging	8.6	5.9
Total management activities	**209.2**	**144.4**

Note: Based on 146,336 problems managed at 100,987 encounters.

Source: AIHW: Britt et al. 2003.

There were 104 medications recorded per 100 encounters, or 72 per 100 problems. These medications could be prescribed (81.3% of all medications), advised for over-the-counter purchase (9.8%), or supplied by the GP (9.0%).

- Medications were prescribed at a rate of 84.3 per 100 encounters or 58.2 per 100 problems managed, at least one being prescribed at 54.9% of encounters and for 47.2% of problems managed. The most commonly prescribed medication groups and generic medications are detailed in Section 6.5 Use of medications.
- Medications were recommended for over-the-counter purchase at a rate of 10.2 per 100 encounters and 7.0 per 100 problems managed. For medications supplied by the GP, the rates were 9.3 per 100 encounters and 6.4 per 100 problems. Medications most often recommended for over-the-counter purchase and supplied by the GP are detailed in Section 6.5 Use of medications.

Over the five years of the BEACH program there has been a significant decrease in the overall rate at which medications were prescribed, but not in the rates at which medications were advised for over-the-counter purchase or supplied by the GP. Changes in patterns of prescribing included:

- decreased rates of prescribing of antibiotics (from 17.3 per 100 encounters in 1998–99 to 13.8 per 100 encounters in 2002–03);
- decreased rates of overall prescribing of respiratory medications (from 6.9 per 100 encounters in 1998–99 to 5.3 per 100 encounters in 2002–03), in particular bronchodilators (from 3.7 per 100 encounters in 1998–99 to 2.5 per 100 encounters in 2002–03); and

- decreased rates of prescribing of simple and compound analgesics (from 4.7 and 3.3 per 100 encounters in 1998–99, respectively, to 3.9 and 2.4 per 100 encounters in 2002–03). In contrast there was an increase in prescription rates for narcotic analgesics (from 1.1 per 100 encounters in 1998–99 to 2.2 per 100 encounters in 2002–03).

Non-pharmacological treatments provided by the GP were classified as clinical and procedural. At least one non-pharmacological treatment was provided for 30.9% of problems. Clinical treatments were more frequent (37.2 per 100 encounters or 25.7 per 100 problems) than procedures (14.6 and 10.1 respectively). General advice and education (6.9 per 100 encounters) was the most common clinical treatment followed by counselling about the problem managed. The most frequent procedure was excision or removal of tissue (2.9 per 100 encounters).

At least one referral was given at 10.6% of encounters for 7.7% of problems. Referrals to medical specialists arose at a rate of 7.7 per 100 encounters, the most frequent being to orthopaedic surgeons. Referrals to allied health professionals were made at a rate of 2.5 per 100 encounters, the majority being to physiotherapists. Admissions to hospital and referrals to the emergency department were rare. Pathology was ordered for more than one in ten problems (at a rate of 32.9 tests per 100 encounters). Imaging was ordered for approximately one in 20 problems, at a rate of 8.6 per 100 encounters.

6.3 Dental services

This section presents information on use of dental care, using data from the National Dental Telephone Interview Survey conducted in 2002 (AIHW: Carter and Stewart 2003).

Children's use of dental care

In 2002, nationally, 81.6% of children aged 5–14 years had made a dental visit in the previous 12 months (Table 6.13). This proportion varied from 72% in the Australian Capital Territory and 74% in Victoria to 89% in Queensland and Western Australia. Just over 60% of children visited for a check-up, while 21% visited for pain or other problem (likely to include fillings and orthodontic consultations) and 18.4% recorded no visit in the previous 12 months. The proportion whose visits were for pain or other problem, rather than for a check-up, ranged from 15.9% in the Northern Territory to 28.0% in Queensland (calculated from Table 6.13).

In 2002, the school dental service provided care within the previous 12 months to more than 60% of children aged 5–9 years in Queensland, South Australia, Western Australia, Tasmania and the Northern Territory (Figure 6.7). The corresponding figures were 34% in Victoria and less than 30% in New South Wales and the Australian Capital Territory. A lower proportion of children aged 10–14 years visited a school dental service in the previous 12 months. Around 50% of children 10–14 in Queensland, South Australia, Tasmania and the Northern Territory, and about 70% in Western Australia had made a dental visit within the previous 12 months at a school dental service. Coverage of this age group (comprising both primary and

secondary students) is affected by variations among the states and territories in eligibility of card holders and secondary students, and in requirements for copayments.

Among children aged 5–14 years who were covered by a government concession card, 72% made their last visit at a school dental service compared with 43% of non-card holders; however, a higher proportion of card holders had not visited in the last year, 27% compared to 16% of non-card holders.

Table 6.13: Last dental visit in the previous 12 months, children 5–14 years, 2002 (per cent)

	Reason for visit				
	Check-up	Pain	Other problem	No visit	At school dental service
Age group					
5–11 years	60.7	6.1	16.0	17.1	54.0
12–14 years	59.9	6.5	11.9	21.7	38.9
State/territory					
New South Wales	58.5	6.4	15.3	19.8	31.7
Victoria	55.2	3.5	15.5	25.8	40.1
Queensland	64.0	10.6	14.3	11.1	67.5
South Australia	62.9	6.0	15.3	15.8	66.1
Western Australia	70.2	3.6	15.7	10.5	78.7
Tasmania	59.0	7.4	11.7	21.9	64.3
Australian Capital Territory	57.8	7.1	6.8	28.3	34.4
Northern Territory	73.9	3.0	11.0	12.1	77.5
Government concession card					
Yes	51.2	6.7	14.8	27.3	71.7
No	63.4	6.0	15.0	15.6	43.0
All	60.5	6.2	14.9	18.4	49.7

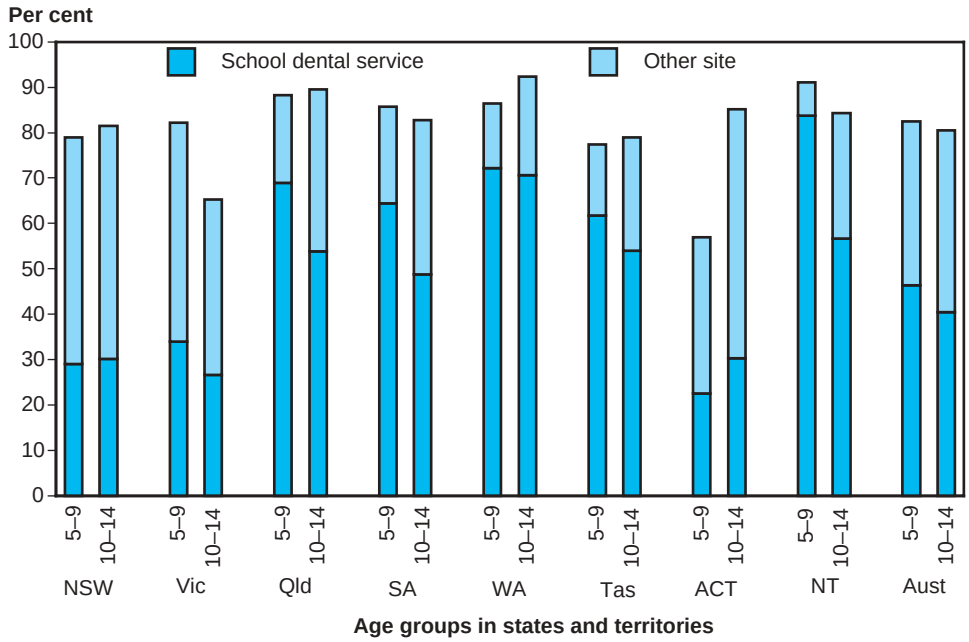
Source: AIHW: Carter and Stewart 2003.

Adult use of dental care

In 2002, over half of dentate Australians (that is, persons with at least one natural tooth) had made a dental visit within the previous 12 months, with 49% of those visiting making their last visit for a dental problem, rather than for a check-up. Problem visits were almost equally split between pain and non-pain problems (Table 6.14). Pain-related problem visits are likely to be made in response to toothache or trauma. Problem visits that are not pain-related are likely to be due to lost or broken fillings and other problems such as sensitivity, staining, chipped teeth and bleeding gums.

Large differences were observed between income groups: the proportion of people last visiting for a check-up increased with income, from 20% for people in households with an annual income of less than $12,000 to 35% for people in households with an annual income of $60,000 or more. Pain- or other problem-related visits, in contrast, did not

vary with income group. The proportions of people not making a dental visit at all in the previous year was higher for the lowest income group (51%), decreasing to 37% of the highest income group.



Note: Estimates from Tasmania, the Australian Capital Territory and the Northern Territory are based on small sample sizes and have relative standard errors of more than 10%.

Source: AIHW: Carter and Stewart 2003.

Figure 6.7: Children aged 5–14 years who made a dental visit within the previous 12 months, states and territories, 2002

The proportion of government concession card holders last visiting for a check-up was lower than that for non-card holders, and reflected with the proportions of card holders and non-card holders not making a dental visit.

There were differences in the visiting rate and services received by card holders who received publicly-funded care and those card holders and non-card holders who received private care at their own expense (Table 6.14). The frequency of check-up visits in the last 12 months ranged from 14% of public-funded card holders to 34% of non-card holders, indicating differences in use of services and the likelihood of receiving ongoing preventive care.

Dental extractions and fillings were more frequent among card holders who received publicly-funded care than other groups. For every 100 card holders receiving publicly-funded dental care within the previous year, 42 had one or more teeth extracted and 53 had one or more fillings. In comparison, of card holders who received private care, 17% had extraction(s) and 46% received filling(s) (Table 6.15).

Table 6.14: Last dental visit in the previous 12 months, dentate persons aged 15 years or more, 2002 (per cent)

	Check-up	Pain	Other problem	No visit
Age group				
15–17 years	53.9	6.0	10.9	29.2
18–24 years	33.3	10.8	8.6	47.3
25–44 years	27.0	16.5	9.7	46.8
45–64 years	27.6	15.9	20.1	36.4
65+ years	29.8	10.6	21.3	38.3
Annual household income				
<$12,000	20.2	14.6	14.5	50.7
$12,000–20,000	21.5	15.7	14.2	48.6
$20,000–40,000	26.8	16.6	13.8	42.8
$40,000–60,000	30.3	14.0	13.4	42.3
$60,000+	35.3	13.3	14.5	36.9
Government concession card				
Yes	20.4	15.4	15.4	48.8
No	33.0	14.0	13.4	39.6
Care provider for last dental visit				
Card holders; publicly-funded care	13.5	24.3	11.5	50.7
Card holders; private care	24.4	11.6	17.9	46.1
Non-card holders; private care	34.1	14.8	14.0	37.1
All	**29.9**	**14.3**	**14.0**	**41.8**

Source: AIHW: Carter and Stewart 2003.

Table 6.15: Treatment at last dental visit, by care provider, dentate persons aged 15 years or more, 2002

	Dental visit within previous 12 months	Extraction within previous 12 months[(a)]		Filling within previous 12 months[(a)]	
	Per cent	Per cent	Average number of extractions	Per cent	Average number of fillings
Card holders; publicly-funded care	49.5	41.8	0.71	52.7	1.41
Card holders; private care	53.9	16.9	0.30	46.0	0.85
Non-card holders; private care	62.9	14.9	0.28	43.8	0.83
All	**58.4**	**17.0**	**0.31**	**43.9**	**0.86**

(a) Subset of dental visit within previous 12 months.

Source: AIHW: Carter and Stewart 2003.

6.4 Specialised mental health services

Australians use a variety of public and private health service providers for mental health care. They include GPs (see above) and specialised mental health services such as private psychiatrists, public community-based mental health services, public and private psychiatric hospitals, and specialised residential mental health care facilities. Public specialised mental health services operate in each state and territory, integrating services provided to patients in community settings, residential care facilities, specialised psychiatric hospitals and specialised psychiatric units within public acute hospitals.

Historically, stand-alone public psychiatric hospitals were the main focus of specialised mental health care. However, the availability of effective antipsychotic drugs, changes in clinical practice and the emergence of the human rights movement provided the setting for reform of mental health care. Since 1993, national action to reform mental health care has been driven by a series of national mental health plans under the National Mental Health Strategy.

Private psychiatry

In 2002–03, there were an estimated 1,030 full-time equivalent psychiatrists in private practice (AIHW 2004). There were 914 in metropolitan areas (6.9 per 100,000 population) and 116 (1.1 per 100,000 population) in rural and remote areas.

Medicare funded 2,065,009 services provided by private psychiatrists in 2002–03. They included 1,781,337 patient attendances in consulting rooms, 205,045 patient attendances in hospitals and 45,078 group psychotherapy services. Females received more services (1,257,236, or 126.1 per 1,000 population) than males (807,773, or 82.3 per 1,000 population), and highest rates were reported for the 45–54-year age group for both sexes (223.8 per 1,000 population for females and 145.3 per 1,000 population for males). Medicare expenditure on these services was $197 million in total, including $178 million for patient attendances in consulting rooms and $14 million for patient attendances in hospitals. Private psychiatrists provided 1,785,825 prescriptions subsidised by the Pharmaceutical Benefits Scheme (PBS) in 2002–03. The most commonly prescribed drugs were antidepressants (968,777) and antipsychotics. PBS expenditure for these pharmaceuticals was $101 million, including $52 million for antipsychotics and $37 million for antidepressants (AIHW 2004).

Community mental health services

Public community mental health services provide specialised mental health care services to patients in community settings. Included are specialised services for adults, for older adults, and for children and adolescents; mobile treatment teams; and hospital-based services such as psychiatric outpatient services, day programs and community outreach services.

In 2001–02, these services (with residential facilities included) had a recurrent expenditure of $778 million and an average of 9,785 full time-equivalent staff (AIHW 2004). Staff numbers increased by 12.8% over the 3 years from 1998–99. However,

reflecting the longer term move of mental health services to community settings, between 1992–93 and 1999–00 the number of clinical full time-equivalent staff rose by 90%, and expenditure rose by 109% (DoHA 2002).

For 2001–02, 4,203,721 service contacts between clients and staff were reported by community mental health care services to the AIHW National Community Mental Health Establishments Database. More service contacts were reported for males (2,123,439) than for females (1,993,625) and highest numbers were recorded for persons aged 25–34 years (906,153) and 35–44 years (849,713) (AIHW 2004).

Schizophrenia, schizotypal and delusional disorders accounted for over 48% of service contacts for which a principal diagnosis was reported (Table 6.16). Principal diagnoses of mood (affective) disorders and neurotic, stress-related and somatoform disorders accounted for 25% and 10% of these service contacts, respectively.

Table 6.16: Public community mental health service contacts by principal diagnosis[(a)], 2001–02

Principal diagnosis	Number	Proportion of service contacts with a principal diagnosis (%)[(b)]
Organic, including symptomatic, mental disorders	99,793	3.6
Mental and behavioural disorders due to psychoactive substance use	75,443	2.7
Schizophrenia, schizotypal and delusional disorders	1,343,960	48.1
Mood (affective) disorders	690,546	24.7
Neurotic, stress-related and somatoform disorders	268,456	9.6
Behavioural syndromes associated with physiological disturbances and physical factors	20,502	0.7
Disorders of adult personality and behaviour	111,529	4.0
Mental retardation	10,324	0.4
Disorders of psychological development	19,345	0.7
Behavioural and emotional disorders with onset usually occurring in childhood and adolescence	99,733	3.6
Other	53,862	1.9
No principal diagnosis reported, including Mental disorder not otherwise specified	1,410,238	. .
Total	**4,203,731**	**100.0**

. . Not applicable.

(a) These data should be used with caution. They are from the second year of the National Community Mental Health Care Database and the quality of the principal diagnosis information is likely to have been inconsistent. No principal diagnosis information was available for service contacts in Queensland.

(b) Excluding those with a principal diagnosis of Mental disorder not otherwise specified.

Source: AIHW 2004.

Non-government organisations also provide community-based mental health-related care. For example, disability support services funded under the Commonwealth-State Disability Agreement provided 4,929 non-residential services to clients with a

psychiatric primary disability on a snapshot day in the first half of 2002, and 4,183 services to clients for whom their psychiatric disability was not their primary disability (AIHW 2004).

Residential mental health care

Specialised residential mental health care facilities are services that provide residential care with specialised mental health care staff on duty either 24 hours a day, or part-time. Some are public sector facilities and others are operated by non-government organisations.

In 2001–02, public residential mental health care facilities that were staffed for 24 hours per day had a total of 1,249 available beds, a decrease of 4% since 1998–99 (1,301 beds). A total of 1,559 overnight stays were reported. The number of beds in these facilities increased by 68% between June 1993 and June 2000 (DoHA 2002).

Non-government organisations funded under the Commonwealth-State Disability Agreement provided 2,514 residential services to clients with a psychiatric disability on a snapshot day in the first half of 2002. For 201 of these services, the client's primary disability was psychiatric (AIHW 2004).

Admitted patients in hospitals

Specialised mental health care is provided to admitted patients in public psychiatric hospitals and in specialised psychiatric units in public acute and private hospitals. There were 100,388 mental health-related separations involving specialised psychiatric care in public hospitals in 2001–02 (Table 6.17), associated with 2,041,886 patient days. Public acute hospitals accounted for 84.4% of public hospital separations and 1,034,139 (50.6%) of the days spent in hospital. The majority of public psychiatric and public acute hospitalisations were for at least one night (overnight; 84.3% and 79.0%, respectively). For private hospitals, there were 87,770 mental health-related separations involving specialised psychiatric care in 2001–02, the majority of which were same-day (74.6%). There were 493,786 patient days associated with these hospitalisations.

Separation and patient day rates varied among the jurisdictions, possibly reflecting different service delivery and admission practices and/or differences in the types of establishments categorised as hospitals (Table 6.17). Overall, highest rates were recorded for same-day separations in Queensland and for overnight separations in South Australia. Highest patient day rates were recorded in South Australia and Tasmania.

Involuntary hospitalisation was more frequent in public psychiatric hospitals, where 41.4% of the separations were involuntary, compared with 31.5% of separations in public acute hospitals and 0.6% in private hospitals (AIHW 2004).

Of the separations with specialised care, 77,189 same-day separations (14,620 in public hospitals and 62,569 in private hospitals) could be considered to be equivalent to ambulatory mental health care (AIHW 2004). These either had psychosocial interventions as the only reported interventions, or no reported interventions.

Table 6.17: Separations with specialised psychiatric care, by state and territory and hospital type[(a)], 2001–02

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
					Number				
Public acute hospitals	26,024	18,451	21,899	7,184	5,752	3,155	1,429	788	84,682
Public psychiatric hospitals	9,663	393	459	2,170	2,833	188	. .	. .	15,706
Private hospitals	24,370	26,973	21,692	9,952	2,520	1,947	316	n.a.	87,770
Separations, same-day	28,152	23,727	22,044	7,928	1,319	2,419	81	55	85,725
Separations, overnight	31,905	22,090	22,006	11,378	9,786	2,871	1,664	733	102,433
Total separations	*60,057*	*45,817*	*44,050*	*19,306*	*11,105*	*5,290*	*1,745*	*788*	*188,158*
Patient days	*1,006,820*	*422,623*	*552,633*	*223,926*	*230,933*	*70,928*	*20,666*	*7,143*	*2,535,672*
					Number per 1,000 population				
Public acute hospitals	4.0	3.8	6.1	3.8	3.8	6.9	4.4	4.0	4.4
Public psychiatric hospitals	1.5	0.1	0.1	1.1	1.9	0.4	. .	. .	0.8
Private hospitals	3.7	5.6	6.0	5.2	1.6	4.1	1.0	n.a.	4.6
Separations, same-day	4.3	4.9	6.1	4.2	0.9	5.1	0.3	0.3	4.4
Separations, overnight	4.8	4.6	6.1	6.0	6.4	6.2	5.2	3.9	5.3
Total separations	*9.1*	*9.5*	*12.2*	*10.2*	*7.3*	*11.3*	*5.5*	*4.2*	*9.7*
Patient days	*148.8*	*82.5*	*148.9*	*115.3*	*150.2*	*149.2*	*64.8*	*38.1*	*126.7*

(a) Interpretation of differences between jurisdictions needs to be undertaken with care, as they may reflect different service delivery and admission practices and/or differences in the types of establishments categorised as hospitals. Victoria has only one public psychiatric hospital. It is a forensic facility and therefore not strictly comparable with public psychiatric hospitals in other jurisdictions.

.. Not applicable.

n.a. Not available.

Source: AIHW 2004.

Excluding those separations, the most frequently recorded principal diagnosis group for overnight separations in public hospitals was schizophrenia, schizotypal and delusional disorders (28,343 separations) (Table 6.18) followed by mood (affective) disorders (21,229). For same-day separations, the most common was mood (affective) disorders (3,496). In private hospitals, the most frequently recorded principal diagnosis for both overnight and same-day separations was mood (affective) disorders (2,289 and 10,916 separations, respectively).

Principal diagnoses commonly reported for the same-day separations that could be considered ambulatory equivalent were mood (affective) disorders (3,424 separations in public hospitals and 28,575 in private hospitals) and neurotic, stress-related and somatoform disorders (3,036 in public hospitals and 16,840 in private hospitals).

Table 6.18: Separations[(a)] with specialised psychiatric care by principal diagnosis and hospital type, 2001–02

	Public hospitals[(b)]		Private hospitals	
Principal diagnosis	**Same-day**	**Overnight**	**Same-day**	**Overnight**
Organic, including symptomatic, mental disorders	24	1,812	2	297
Mental and behavioural disorders due to psychoactive substance use	160	6,174	264	3,264
Schizophrenia, schizotypal and delusional disorders	810	28,343	190	2,295
Mood (affective) disorders	3,496	21,229	2,289	10,916
Neurotic, stress-related and somatoform disorders	419	9,326	156	4,004
Behavioural syndromes associated with physiological disturbances and physical factors	176	777	5	611
Disorders of adult personality and behaviour	112	4,503	33	486
Mental retardation	5	185	0	4
Disorders of psychological development	11	155	0	12
Behavioural and emotional disorders with onset usually occurring in childhood and adolescence	38	675	1	29
Other or not reported	334	7,004	11	332
Total	**5,585**	**80,183**	**2,951**	**22,250**

(a) Excludes 77,189 same-day separations categorised as ambulatory-equivalent.

(b) Includes public psychiatric hospitals.

Source: AIHW 2004.

Psychiatric hospitals

The mental health care reforms of the last decade have seen a reduction in the proportion of resources devoted to public psychiatric hospitals and a corresponding increase in resources for psychiatric units in acute care hospitals.

Between 1995–96 and 2001–02, the number of public psychiatric hospitals fell from 34 to 22 (Table 6.4), and bed numbers fell 38%, from 3,992 to 2,457 (AIHW 2002). Matching this pattern, between 1992–93 and 1999–00 there was a decrease in spending per person on these hospitals, from $33 to $19 per year (DoHA 2002). In 2001–02, total recurrent expenditure for these hospitals (including non-admitted patient and community services managed by the hospital) was $445 million, and they employed an average of 5,545 full-time equivalent staff (AIHW 2004).

The reduction in public psychiatric hospitals has been accompanied by an increase in the number of psychiatric unit beds in public acute care hospitals. They increased by 51% between 1992–93 and 1999–00, during which time there was an increase in spending on them from $15 to $23 per person per year (DoHA 2002). In 2001–02, there were 107 public acute hospitals with specialised psychiatric units, with a total of 2,199 beds (AIHW 2004).

In 2001–02, there were 24 private psychiatric hospitals (ABS 2003a). They had a total of 1,387 beds, within the range reported for 1998–99 to 2000–01 (1,344 to 1,471). These hospitals had an expenditure of $144 million, and employed an average of 1,707 full-time equivalent staff, mainly nurses (919).

Vietnam Veterans Counselling Service

The prevalence of anxiety disorders, depression and post-traumatic stress disorder was found to be higher in male Vietnam veterans than expected in the community generally (DVA 1998). In a survey conducted in 1997, anxiety disorders were reported by 41% of responding veterans, higher than expected based on the prevalence of anxiety disorders in the general community (31%). Depression (45%) and post-traumatic stress disorder (31%) were also more common than expected (36% and 8% respectively).

The DVA recognises these conditions as consequences of war-related service and established the Vietnam Veterans Counselling Service (VVCS) to help veterans cope with them. The VVCS offers free services to veterans of all conflicts, including those from peacekeeping missions. Partners of veterans are also eligible, as are the sons and daughters of Vietnam veterans. The service operates from 15 centres across Australia and provides services in rural, remote and outer metropolitan areas through more than 320 Outreach Program counsellors.

Services include counselling, therapeutic and educational group programs, community development and health promotion. There are specialist projects such as one aimed at promoting cardiovascular fitness, and another at sons and daughters to combat suicide. VVCS also provides an after-hours telephone crisis counselling service known as Veterans Line.

Outreach Program counselling session numbers numbered 33,385 in 2002–03 and there were 6,499 calls to the Veterans Line (Table 6.19).

Table 6.19: Vietnam Veterans Counselling Service activity, 2002–03

Service	Number
Outreach Program counselling sessions	33,385
Veterans Line calls	6,499
Centre-based counselling	
Hours	25,656
Clients	13,097
Services	30,048

Source: Department of Veterans' Affairs, unpublished data.

6.5 Use of medications

The use of medications is the most common health-related action taken by Australians (ABS 1997). Estimates from the National Health Survey in 1995 were that 59.1% of Australia's population had used some form of conventional medication (medications other than homeopathic, herbal, nutritional, and other complementary and alternative medicines) in the two weeks before the interview. About 25.8% had used vitamins or minerals and 1.7% had used herbal or natural medications.

Prescription medications are provided largely through community pharmacies and hospitals, whereas non-prescription medicines and complementary and alternative medicines are available from pharmacies and other retail outlets. At 30 June 2002, there were 4,926 approved community pharmacies in Australia (Pharmacy Guild of Australia 2004).

Prescribed medicines

Information on the supply of prescription medicines in the community is compiled by the Health Insurance Commission. This information is derived from prescriptions submitted for subsidy payment under the Pharmaceutical Benefits Scheme or the Repatriation Pharmaceutical Benefits Scheme (PBS and RPBS, see Box 6.5) and estimates of the use of non-subsidised prescription medicines, calculated from data collected for the Pharmacy Guild of Australia's ongoing survey of community-based pharmacies. Data are not available on the use of prescribed medicines in public hospitals and most private hospitals.

In 2002–03, there were 158.5 million community PBS prescriptions, 25.9 million for general patients and 132.7 million for concessional patients (DoHA 2004). This was an increase of 2.6% over the 154.5 million in 2001–02 and of 7.4% over the 147.6 million in 2000–01. Additionally, there were 15.4 million RPBS prescriptions in 2002–03 and 0.5 million PBS doctor's bag prescriptions.

In 2002–03 there were about 42.1 million prescriptions which did not attract a subsidy (26.0 million below the co-payment threshold and about 16.1 million private prescriptions, that is, prescriptions for drugs not covered by the PBS or RPBS) (DoHA unpublished data).

Apparent use of prescription medicine can be described using defined daily dose per 1,000 population per day (DDD/1,000/day) as the unit of measurement. The DDD is based on the assumed average dose per day of the drug, used for its main indication (reason for use) by adults. It provides an estimate of how many people per 1,000 population are taking the standard dose of the drug each day, on average, and allows for comparisons independent of differences in quantities of drugs per prescription. These measures assume, however, that the amount of medicines supplied is the same as the amount used, and that will not always be the case.

In 2002–03, atorvastatin (used for blood lipid (cholesterol) reduction) was the most commonly used drug using the DDD/1,000/day measurement (Table 6.20), followed by simvastatin (also used for blood lipid reduction) and diltiazem hydrochloride (a calcium channel blocker used for the treatment of chest pain and high blood pressure).

The top three generic medications by prescription volume in 2002–03 were atorvastatin and simvastatin (6.2 million and 5.5 million prescriptions respectively), followed by omeprazole (an anti-ulcer drug, 4.7 million prescriptions) and salbutamol (a bronchodilator mainly used for asthma, 4.4 million prescriptions). For most of these high-volume prescriptions, the vast majority were provided through the PBS or RPBS; however, salbutamol was provided as a non-PBS/RPBS prescription on 1.1 million occasions (24.4%) (Table 6.20).

Box 6.5: The Pharmaceutical Benefits Scheme

The Pharmaceutical Benefits Scheme (PBS) subsidises the cost of a wide range of prescription medications, providing Australians with access to necessary and cost-effective medicines at an affordable price. As at 1 February 2004, the scheme covered

- *602 generic drugs in 1,502 forms and strengths (items) marketed as 2,617 different drug products (brands) as general listings*
- *10 generic drugs in 42 forms and strengths marketed as 48 products as palliative care listings*
- *78 generic drugs in 209 forms and strengths marketed as 475 products as dental listings*
- *27 generic drugs in 34 forms and strengths marketed as 51 products as Doctor's bag listings*
- *75 generic drugs in 257 forms and strengths marketed as 273 products as Section 100 listings.*

Section 100 medicines are distributed through arrangements other than community pharmacies as appropriate, for example through hospitals with access to appropriate specialist facilities. They include medications for chronic conditions provided under the Highly Specialised Drugs Program.

Before a medicine can be subsidised by the PBS, it is assessed by the Pharmaceutical Benefits Advisory Committee, which includes medical practitioners, other health professionals and a consumer representative. The committee takes into account the medical conditions for which the medicine has been approved for use in Australia by the Therapeutic Goods Administration, its clinical effectiveness, safety and cost-effectiveness compared with other treatments. Once a medicine has been recommended by the committee, it is considered by the Pharmaceutical Benefits Pricing Authority, the price is negotiated between the manufacturer and the Department of Health and Ageing, and the listing is then considered by the Australian Government.

Australian residents and visitors from those countries with which Australia has a Reciprocal Health Care Agreement are eligible for PBS benefits. Patients are grouped into two classes. General patients pay the first $23.70 for each prescription item. Concessional patients (people with low incomes and sickness beneficiaries who hold a health care card) make a copayment of $3.80 per prescription item.

Individuals and families are protected from large overall expenses for PBS-listed medicines by safety nets. Once a general patient and/or immediate family has spent $726.80 in a calendar year, the patient co-payment per item decreases to the concessional rate of $3.80 per item. For concessional patients, the $3.80 co-payment is not required once their expenditure on PBS items exceeds $197.60 in a calendar year. These co-payments and safety net thresholds are indexed according to movements in the Consumer Price Index from 1 January each year.

(continued)

Box 6.5 *(continued)*: The Pharmaceutical Benefits Scheme

Patients may pay more than the standard co-payment where a PBS item is priced above the benchmark price for different brands of the same drug or the benchmark price for a particular therapeutic group of drugs. These additional payments do not count towards safety nets.

The Repatriation Pharmaceutical Benefits Scheme (RPBS) provides assistance to eligible war veterans and dependants. It is generally similar to the PBS for concessional beneficiaries and covers 172 additional generic drugs available in 368 forms and strengths marketed as 422 products.

Table 6.20: Top 15 generic medications by defined daily dose per 1,000 population per day, 2002–03

		Defined daily dose per 1,000 population			Prescriptions		
Generic name	**Action**	**PBS/RPBS**	**Other[(a)]**	**Total**	**PBS/RPBS**	**Other[(a)]**	**Total**
Atorvastatin	Blood lipid-reducing	66.05	0.10	66.15	6,202,867	11,720	6,214,587
Simvastatin	Blood lipid-reducing	43.48	0.04	43.52	5,460,842	4,763	5,465,605
Diltiazem hydrochloride	Anti-angina and anti-hypertensive	41.09	0.19	41.28	1,529,054	1,509	1,530,563
Salbutamol	Bronchodilator	20.44	7.49	27.93	3,317,652	1,071,413	4,389,065
Ramipril	Anti-hypertensive	26.30	0.56	26.86	2,501,351	135,253	2,636,604
Omeprazole	Anti-ulcer	22.61	0.05	22.66	4,664,881	10,124	4,675,005
Rofecoxib	Anti-inflammatory	20.62	0.14	20.77	2,929,013	19,238	2,948,251
Frusemide	Diuretic	19.46	1.25	20.70	1,376,031	92,914	1,468,945
Irbesartan	Anti-hypertensive	18.07	0.10	18.18	3,073,831	39,993	3,113,824
Irbesartan with hydrochlorothiazide	Anti-hypertensive	17.63	0.04	17.67	2,380,637	5,784	2,386,421
Aspirin	Analgesic, anti-coagulant	15.62	1.07	16.68	1,352,338	103,574	1,455,912
Amlodipine besylate	Anti-hypertensive	15.16	1.07	16.23	2,326,904	24,1086	2,567,990
Celecoxib	Anti-inflammatory	15.76	0.14	15.90	3,534,851	32,018	3,566,869
Sertraline	Antidepressant	15.72	0.09	15.82	2,440,835	12,784	2,453,619
Thyroxine sodium	Thyroid hormone replacement	9.60	4.90	14.50	623,686	298,135	921,821

Note: PBS–Pharmaceutical Benefits Scheme; RPBS–Repatriation Pharmaceutical Benefit Scheme.

(a) Prescriptions not subsidised by the PBS or RPBS, because they were private prescriptions or the cost to the patient was not more than the patient co-payment.

Source: Drug Utilisation Sub-Committee Database (DoHA, unpublished) as at 12 January 2004.

The use of some prescription medicines has changed markedly over the last few years. For example, between 2001–02 and 2002–03 there was a nearly four-fold increase in the DDD/1,000 population/day for rofecoxib (an anti-inflammatory). Conversely there was a 46% decrease in the DDD/1,000 population/day for celecoxib (also an anti-inflammatory) over this period (Table S40). The DDD/1,000 population/day for the blood pressure lowering ramipril increased by 109% between 2000–01 and 2002–03, but the increase in prescription volume for this drug was less marked (66%).

Atorvastatin, simvastatin and omeprazole were the highest cost drugs for the PBS in 2002–03, with PBS expenditure on them totalling $364.7 million, $328.8 million and $220.1 million respectively. The next most costly were salmeterol and fluticasone (a bronchodilator and anti-inflammatory combined, $167.5 million) and olanzapine (an antipsychotic agent, $144.0 million) (DoHA 2004). Between 2000–01 and 2002–03, expenditure on atorvastatin, simvastatin and omeprazole increased by 16%, 11% and 9% respectively. For salmeterol and fluticasone, expenditure increased by 32% and expenditure on olanzapine increased by 9% (DoHA 2003b).

The BEACH survey of general practice activity collects information on drugs prescribed by GPs (AIHW: Britt et al. 2003). In 2002–03, medications were prescribed at a rate of 84.3 per 100 encounters. Antibiotics were the most commonly prescribed group, accounting for 16.4% of all prescriptions. The next most common were cardiovascular medications (15.5%), central nervous system medications (12.5%), psychological medications (8.3%), musculoskeletal medications (6.8%) and respiratory medications (6.3%).

The most frequently prescribed individual generic medications are listed in Table 6.21. Four of the top ten drugs are from the antibiotic group. Simple analgesics were also frequently prescribed, reflecting their prescription for health care card holders for whom they are a cheaper option than over-the-counter purchase.

Table 6.21: Medications most frequently prescribed by GPs, 2002–03

Generic name	Action	Proportion of prescriptions (per cent)	Prescriptions per 100 encounters
Paracetamol	Analgesic	3.7	3.1
Amoxycillin	Antibiotic	3.7	3.1
Paracetamol+codeine	Analgesic	2.4	2.0
Cephalexin	Antibiotic	2.3	1.9
Salbutamol	Bronchodilator	2.0	1.7
Amoxycillin+potassium clavulanate	Antibiotic	1.9	1.6
Influenza virus vaccine	Vaccine	1.7	1.4
Roxithromycin	Antibiotic	1.6	1.3
Temazepam	Sedative	1.4	1.2
Rofecoxib	Anti-inflammatory	1.4	1.2

Source: AIHW: Britt et al. 2003.

Non-prescribed medicines

The BEACH survey collects and reports information on drugs that GPs advise patients to purchase over the counter, and those that the GPs supply directly (AIHW: Britt et al. 2003).

In 2002–03, 9.8% of medications prescribed, advised or provided by GPs were advised for over-the-counter purchase, and 9.0% were supplied by the GP. Australia-wide, this would represent nearly 10 million recommendations for the purchase of drugs, and over 9.3 million supplies of drugs by GPs. Over a quarter of drugs (25.1%) advised for over-the-counter purchase were for paracetamol and 6.5% for ibuprofen (an anti-inflammatory drug). The most common medications supplied by GPs were vaccines (influenza virus vaccine and oral polio vaccine) and rofecoxib (an anti-inflammatory).

Complementary and alternative medicines

In addition to the prescribed pharmaceuticals and other conventional medications, some Australians use a range of complementary and alternative medicines, including homoeopathic, herbal and nutritional medications.

A study in 2000 estimated that 60% of women and 44% of men in South Australia had used alternative medicines in the previous year. Most commonly used were non-prescribed vitamins (32% of males and 41% of females), aromatherapy oils (8% of males and 22% of females), herbal medicines (10% of males and 17% of females) and mineral supplements (10% of males and 12% of females). There had been a significant increase in use of alternative medicines by females compared with 1993 (55%), with greatest increases in the use of herbal medicines, aromatherapy oils and ginseng. It was estimated that average expenditure per person per year on alternative medicines was $315, or the equivalent of $1.67 billion for Australia for 2000. This represented an increase of 120% (after adjusting for inflation) over the expenditure estimated for 1993 ($0.62 billion) (MacLennan et al. 2002).

6.6 Alcohol and other drug treatment services

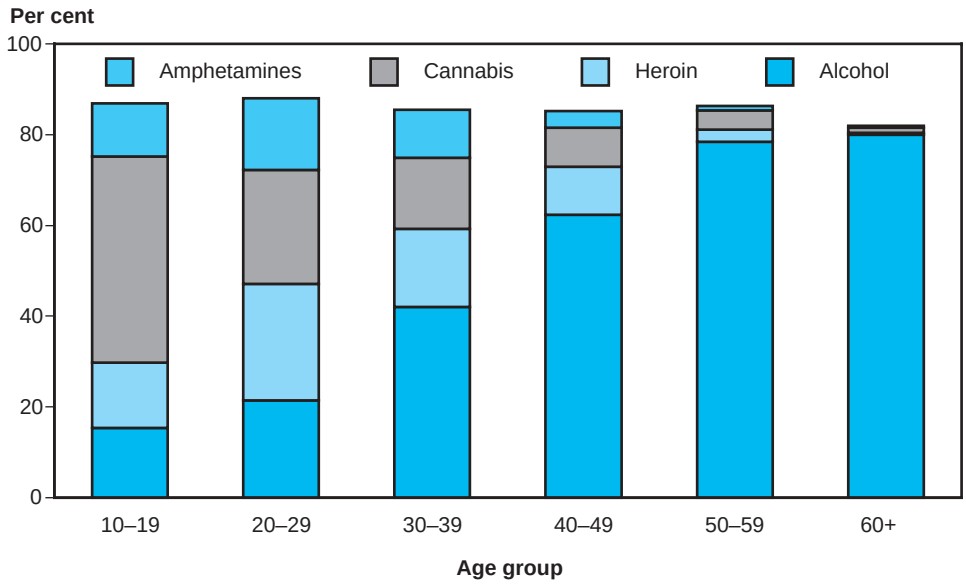
Alcohol and other drug treatment services cover a wide variety of treatment interventions and include detoxification and rehabilitation programs, information and education courses, and pharmacotherapy and counselling treatments, provided in both residential and non-residential settings. In 2001–02, 505 treatment agencies reported data for the Alcohol and Other Drug Treatment Services National Minimum Data Set, with 51% identified as non-government agencies (AIHW 2003a). This data set covers almost all government-funded treatment agencies. Major exceptions are services that are specific for Aboriginal and Torres Strait Islander peoples (as described in Section 6.7) and those for which the sole treatment provided is methadone treatment (opioid pharmacotherapy maintenance).

In 2001–02, 'closed treatment episode' data were collected for the AODTS-NMDS. A closed treatment episode refers to a period of contact between a client and a treatment

agency with defined dates of commencement and cessation. A closed treatment episode could be for a single treatment (such as education and information only) that may be part of a larger treatment plan. During 2001–02, there were 120,869 closed treatment episodes in these 505 alcohol and other drug treatment services (AIHW 2003a). Male clients accounted for close to two-thirds (65%) of these episodes. The majority of episodes were for clients aged between 20 and 49 years (77%), with just over one-third of all episodes (34%) provided for clients in the 20–29-year age group.

Principal drug of concern

The principal drug of concern refers to the main substance that clients state led them to seek treatment from the alcohol and other drug treatment agency. In 2001–02, there were 113,231 episodes where clients were seeking treatment for their own substance use and nominated a principal drug of concern. Nationally, alcohol (37%) and cannabis (21%) were the most common principal drugs of concern to clients in closed treatment episodes, followed by heroin (18%) and amphetamines (11%) (AIHW 2003a). Cannabis was the drug most commonly recorded for clients in the 10–19-year age group (46%), whereas for clients in the 20–29-year age group heroin was the most common drug (26%) (Figure 6.8). Alcohol was nationally the most commonly reported principal drug of concern (37% of episodes) and was reported for higher proportions of clients aged over 30 years, with highest proportions for clients aged 60 years and over (80%) and clients aged 50–59 years (79%).



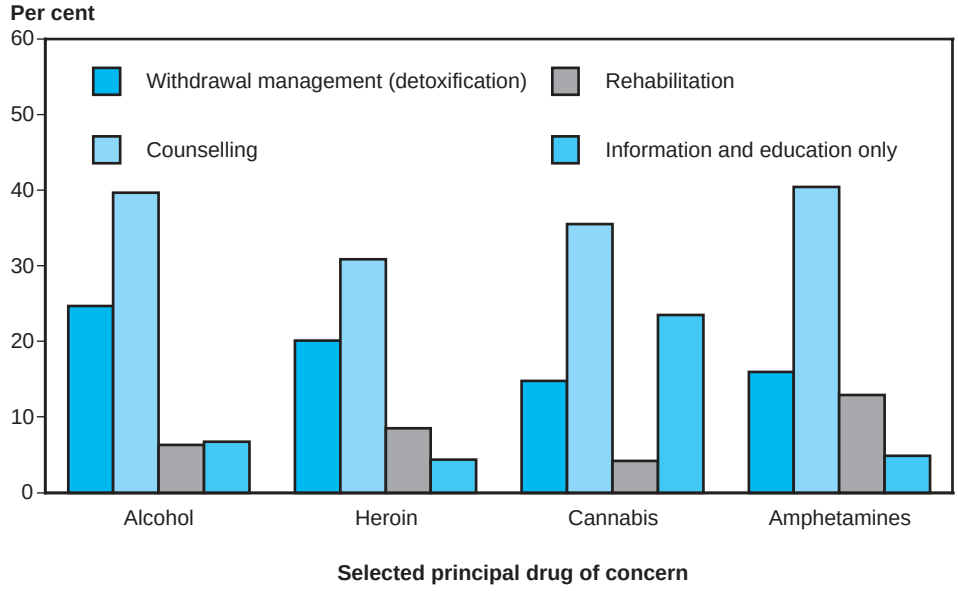
Source: AIHW 2003b.

Figure 6.8: Closed treatment episodes by selected principal drug of concern and age group, 2001–02

Treatment programs

In 2001–02, counselling was the most common form of main treatment provided (39% of closed treatment episodes), followed by withdrawal management (detoxification) (19%), assessment only (without treatment) (15%), and information and education only (without treatment) (10%) (AIHW 2003a). Rehabilitation was the main treatment in 6% of episodes.

The type of main treatment provided varied depending on the principal drug for which the client sought treatment. Closed treatment episodes where the principal drug was alcohol were more likely to involve withdrawal management (detoxification) (25%) than treatment episodes where the principal drug was cannabis (15%) (Figure 6.9). Treatment episodes for amphetamine use were more likely to include counselling (40%) than treatment episodes for heroin use (31%).



Source: AIHW 2003b.

Figure 6.9: Closed treatment episodes by selected main treatment type and selected principal drug of concern, Australia, 2001–02

6.7 Primary health care services for Aboriginal and Torres Strait Islander peoples

Section 4.6 of this report provides data on the health status of, hospitalisation rates for and use of GPs by Aboriginal and Torres Strait Islander people, demonstrating that the pattern of use of these mainstream services is different for Indigenous peoples compared with the rest of the Australian population. Health expenditure data (Section 5.2) reinforce this point.

Mainstream services are not always accessible to or the most appropriate provider for Aboriginal and Torres Strait Islander people, due to a mix of geographic, social and cultural reasons. Because of this, and the relatively poor health status of Aboriginal and Torres Strait Islander people, state, territory and Australian governments provide funds for specific health care services to meet the needs of Indigenous people.

The state and territory governments provide funding primarily through hospitals and community clinics. The Australian Government, through the Office for Aboriginal and Torres Strait Islander Health (OATSIH), provides funding for a range of Indigenous-specific health and substance use services, which are largely delivered in community-based settings. In 2002–03, OATSIH funding was provided to 184 Aboriginal and Torres Strait Islander community controlled health organisations that provided or purchased Aboriginal and Torres Strait Islander primary health care services across Australia. These included 66 that provided substance use services, of which 43 were specific substance use services including 30 that provided residential services (DoHA unpublished data).

The OATSIH-funded Aboriginal and Torres Strait Islander primary health care services (which may also receive funding from other sources such as state and territory governments) are known as Aboriginal Medical Services. They operate in urban, rural and remote locations and offer a wide range of services, including management of acute and chronic health conditions, preventive health measures (such as immunisation and screening) and health promotion activities, transport services, advocacy and assistance in accessing other appropriate community and health services. A small number provide specific programs only, such as dental care, health promotion and counselling.

In 2000–01, approximately 1,340,000 episodes of health care were provided to Indigenous and non-Indigenous clients by 124 Aboriginal and Torres Strait Islander primary health care services (not including specific substance use services) that reported data to OATSIH (DoHA and NACCHO 2003). This compares with approximately 1,200,000 episodes reported by 117 services in 1999–00, 1,060,000 episodes reported by 108 services in 1998–99 and 860,000 episodes reported by 105 services in 1997–98. These services covered an estimated Aboriginal and Torres Strait Islander health service population of 645,000 in 2000–01 compared with 615,000 in 1999–00 (for 115 services), 515,000 in 1998–99 (108 services) and 410,000 in 1997–98 (105 services). Approximately 1,210,000 (90.3%) of the estimated episodes of health care in 2000–01 were provided to Aboriginal and Torres Strait Islander clients. Of these, 60% were provided to female clients.

Respondent Aboriginal and Torres Strait Islander primary health care services employed 2,300 full-time-equivalent staff in 2000–01. Of these, 67% were Aboriginal or Torres Strait Islander staff members. This did not include 200 full-time-equivalent staff who worked at the services but were not paid by the services. Nearly all Aboriginal and Torres Strait Islander health workers and substance use workers were Indigenous people, whereas most nurses and almost all doctors, dentists and specialists were non-Indigenous.

6.8 National Diabetes Services Scheme

The National Diabetes Services Scheme subsidises the supply of insulin syringes, special injection system needles and diagnostic reagents (blood and urine testing strips) to registered persons with diabetes (DoHA 2004). It is funded by the Australian Government and administered through Diabetes Australia, which coordinates the supply of products in all states and territories.

There were 614,727 persons with diabetes registered with the scheme in 2002–03, an increase of 11.8% over the 549,994 in 2001–02 and of 24.5% over the 493,919 in 2000–01 (Table 6.22). At 31 December 2002, persons who did not use insulin comprised the majority (68.5%). In 2002–03, subsidies were provided for 1.6 million supplies of diagnostic reagents and 0.5 million needle and syringe supplies. Australian Government expenditure on the scheme in 2002–03 was $81.4 million, an increase of 23.6% from the $65.9 million in 2001–02.

Table 6.22: The National Diabetes Services Scheme, 2000–01 to 2002–03

	Expenditure ($ million)	Persons registered	Needle and syringe supplies	Diagnostic reagent supplies
2000–01	58.1	493,919	n.a.	n.a.
2001–02	65.9	549,994	440,366	1,425,476
2002–03	81.4	614,727	481,001	1,592,512

n.a. Not available.

Source: DoHA 2004 and unpublished data.

6.9 Hearing services

Public hearing services are provided through the Australian Government's Office of Hearing Services. The Office issues vouchers to eligible clients (persons aged 21 years or more who are Pensioner Concession card holders or their dependants, DVA card holders in certain categories or their dependants, sickness allowance recipients or their dependants, clients referred from CRS Australia (formerly the Commonwealth Rehabilitation Service), and members of the Australian Defence Force). Clients present the voucher to an accredited service provider to obtain services such as hearing assessment; audiological rehabilitation and maintenance; prescription, selection and fitting of hearing devices; and subsidised battery supply and device repair.

In 2002–03, 160,000 clients were issued with a voucher and there were 565,016 voucher hearing services provided (Table 6.23). Most of these were maintenance services (54%), assessment services (25%) and fittings (19%).

Between 1999–00 and 2002–03, the overall number of services increased by 17%, mainly due to increases in maintenance services and assessment services. Although most service types increased, the number of new monaural hearing aid fittings decreased by 17%, from 19,073 to 15,887. The number of return monaural fittings also decreased, but increased relative to 2000–01.

In addition, Australian Hearing provides services to persons under the age of 21 and adults with special needs (for example persons with complex hearing rehabilitation needs, eligible Aboriginal and Torres Strait Islander people, and persons living in

remote locations) under its Community Services Obligations program. In 2002–03, services were provided to 28,015 persons under the age of 12 years, and 10,873 adults with complex hearing rehabilitation needs. Of the 38,888 persons provided with services under this program, 1,814 (4.7%) were Aboriginals or Torres Strait Islanders.

Table 6.23: Hearing services provided through the voucher system and community service obligation arrangements, 2002–03

Type of service	1999–00	2000–01	2001–02	2002–03
Assessments				
New	57,867	57,555	63,399	69,540
Return	55,171	53,750	61,061	68,910
Total assessments	*113,038*	*111,305*	*124,460*	*138,450*
Hearing aid fitted				
New monaural fit	19,073	17,381	16,488	15,887
New binaural fit	30,921	29,277	33,984	39,401
Subsequent binaural	9,636	9,416	10,703	10,960
Return monaural fit	18,018	15,997	16,047	17,066
Return binaural fit	22,291	18,869	18,815	22,272
Total hearing aid fitted	*99,939*	*90,940*	*96,037*	*105,586*
Replacements	12,969	14,689	16,294	17,642
Maintenance	257,744	262,972	288,271	303,338
Total	**483,690**	**479,906**	**525,062**	**565,016**

Source: Office of Hearing Services unpublished data.

6.10 Family planning services

A range of clinical, community education and professional training services in sexual and reproductive health are provided by family planning organisations. The clinical services provided to individuals include contraceptive services, counselling and information services, early intervention and health promotion services, and the management of sexual and reproductive health. Family planning organisations provide these services to clients who choose not to use, or do not have access to, mainstream health services, including young people, migrant populations, the homeless and people with disabilities. There are differences among the state and territory family planning organisations in the way service use is defined. Therefore, the data presented here should be interpreted with care.

During 2001–02, 129,879 client visits were made to family planning organisations (excluding those in South Australia) (SH&FPA 2002). When clients visit a family planning organisation they may access a single service or a combination of services; a total of 131,872 services were reported for 2001–02. Clients who were aged less than 25 years received 36% of services and 25% of services were delivered to clients aged 40 years and over. Males made 3% of client visits, although the number of males who attended with their female partners (that is, as couples) is unknown. About 16% of client visits were made by people born outside Australia.

Family planning organisations also provide education and training programs. In 2001–02, about 13,869 people (mainly health and education professionals) attended training sessions, and over 100,000 attended general, community or school education programs.

6.11 Ambulance services and the Royal Flying Doctor Service

Ambulance services are provided by state and territory governments, except in Western Australia and the Northern Territory, where St John's Ambulance Australia is contracted to provide the services.

The role of ambulance services generally includes providing emergency pre-hospital patient care and transport in response to sudden illness and injury, retrieving emergency patients, transporting patients between hospitals, conducting road accident rescues and coordinating patient services in multi-casualty events. Some government ambulance services also provide first aid training courses, as do non-government providers such as St John's Ambulance and Australian Red Cross.

In 2002–03, there were approximately 2.23 million incidents requiring a response from ambulance services in Australia; and 2.56 million responses to incidents. A total of 44.6% were emergency incidents, 20.1% were urgent incidents and 35.3% were non-emergency incidents. In total, there were services provided to about 2.15 million patients. Of those 88.5% were transported and the remainder were treated but not transported. Road distances traveled totaled 43.4 million kilometres and also reported were 12,890 fixed wing flying hours and 7,255 rotary wing flying hours (SCRGSP 2004).

The Royal Flying Doctor Service provides emergency health services, primary health care clinics at remote sites (such as routine health checks and advice, immunisation, child health care, and dental, eye and ear clinics), telehealth consultations via radio, telephone or videoconference, and transfers of patients between rural and remote area hospitals and metropolitan hospitals. In 2001–02 it provided services to 193,943 patients, of whom 55% attended 8,861 health care clinics, 29% received telehealth consultations, 13% were transported by aerial evacuation (including interhospital transfers) and the remaining 3% received immunisations. The number of patients receiving services increased by 27% from 153,012 patients in 1991–92 (RFDS 2002).

6.12 Other community health services

Government-funded community health services in each state and territory of Australia provide a diverse range of health services, not described elsewhere in this chapter. Statistical information on these services is not developed, with incomplete coverage of services, data systems under development and no agreed basis for measuring volumes across diverse service types, nor for distinguishing between services reported to national data collections and those not reported. Therefore a comprehensive national picture of community health services cannot be provided. However, some information on the nature of the services follows.

Typically, the services include those for particular population groups, such as maternal and child health services, men's health services, women's health services, health services for the aged, health services for those with a severe chronic disease or disability, health services for Aboriginal and Torres Strait Islander peoples, and multiculturally based services.

The types of services provided include health promotion, education and early intervention, primary health care, home nursing, nutrition services, allied health services

such as physiotherapy, post-hospital discharge programs, rehabilitation services, palliative care and sexual health services.

Services are delivered in a number of different settings, such as community health centres, local council buildings, schools and clients' homes.

6.13 Complementary and alternative health services

A range of services complement or provide alternatives to mainstream health care services. Estimates from the 2001 National Health Survey (ABS 2001) were that about 3.5% of the population (661,400) consulted a complementary or alternative health professional in the two weeks before the survey interview, 4.1% of females (388,700) and 2.9% of males (272,700) (Table 6.24). The majority of consultations (423,800) were for persons aged between 25 and 54 years. About 2.0% (387,900) of Australians consulted a chiropractor, 1.0% (129,800) consulted a naturopath and about 177,300 consulted an acupuncturist, herbalist, hypnotherapist or osteopath.

Table 6.24: Persons reporting consultations with complementary and alternative health professionals ('000)[(a)], by age group and sex, 2001

										Total		
	0–4	5–14	15–24	25–34	35–44	45–54	55–64	65–74	75+	Males	Females	Persons
Chiropractor	*8.3	29.7	34.6	76.2	84.6	80.9	40.0	21.8	*11.8	188.4	199.4	387.9
Naturopath	**	*9.4	*12.0	25.0	30.0	29.5	*11.1	*3.6	*6.2	32.9	96.8	129.8
Other[(b)]	**	*3.1	16.4	39.6	43.9	36.6	17.2	*10.9	*7.4	61.0	116.3	177.3
Total[(c)]	***13.4**	**40.2**	**61.2**	**138.6**	**148.5**	**136.7**	**66.4**	**34.5**	**21.9**	**272.7**	**388.7**	**661.4**

* Estimate has a relative standard error of between 25% and 50% and should be used with caution.

** Estimate has a relative standard error greater than 50% and is considered too unreliable for general use.

(a) Consultations in the 2 weeks before interview. Excludes consultations in/at hospitals or day clinics.

(b) Includes acupuncturist, herbalist, hypnotherapist and osteopath.

(c) Total will not necessarily be the sum of the rows, as some persons reported consultations with more than one type of professional.

Source: ABS 2001 and unpublished data.

A study in 2000 estimated that 26% of women and 20% of men in South Australia had visited an alternative therapist in the previous year. Chiropractors (16% of males and 17% of females), naturopaths/natural therapists (3% of males and 9% of females) and acupuncturists (3% of males and females) were the most commonly visited. Average expenditure per person per year on alternative therapists was estimated at $252, or the equivalent of $616 million for Australia for 2000. This represented an increase of 62% (after adjusting for inflation) over the expenditure estimated for 1993 ($309 million) (MacLennan et al. 2002).

The extent to which these services have been incorporated into the general healthcare system varies. Only acupuncture performed by a medical practitioner attracts a Medicare rebate; rebates totalled $13.5 million in 2002–03, for 595,000 acupuncture Medicare items, compared with $15.2 million and 719,000 Medicare items in 2000–01. Some private health ancillary insurance covers some of these services, such as those provided by naturopaths, osteopaths and chiropractors.

6.14 Public health interventions

Public (or population) health interventions are formally activities defined widely as representing the organised response by society to protect and promote health and to prevent illness, injury and disability. Less formally, they are visible as health awareness and promotion campaigns (such as the *Slip Slop Slap* sun protection advertisements and the *Life. Be in It* promotional activities) and disease prevention services (such as the breast cancer screening program).

Public health activities may focus on populations or population groups or they may focus on the environment (for example, maintaining water and air quality). Some initiatives are carried out by non-health organisations (such as transport departments) while others are undertaken in the health arena. Some work through the treatment system (including hospitals and medical practitioners); however, most are aimed at people who are not ill, but have the potential to become ill due to their biological characteristics (such as age, in relation to falls) or their behaviours (such as smoking, in relation to cancer).

Some examples of the range of public health interventions are:

- cancer screening and sun protection awareness campaigns
- immunisation programs and campaigns (recently for meningococcal disease)
- illicit drug awareness campaigns and safe drug-injecting facilities
- anti-smoking campaigns and support groups
- exercise programs for schools and the elderly.

Public health activities of particular interest in recent years were the work planning responses to bioterrorism threats (such as anthrax) and to the outbreak of the SARS virus, and managing the risks around international events such as the Rugby World Cup and natural events such as the Canberra bushfires. In these instances, specific emergency response training was implemented, emergency department rapid data capture systems were put in place to monitor any outbreaks of diseases and symptoms, management protocols were designed as new information came to light about potential diseases, and potentially harmful sources of infection were minimised.

Three key public health interventions are described below—cancer screening, childhood immunisation, and needle and syringe programs.

Cancer screening

For breast, cervical and bowel cancers, there is evidence that illness and death can be reduced through population-based screening and effective follow-up treatment. National screening programs for breast cancer (via mammography) and cervical cancer (via Pap smears) have been implemented in Australia with the aim of achieving this reduction. These programs are called BreastScreen Australia and the National Cervical Screening Program. Pilot tests for a population-based screening program for bowel cancer are currently being undertaken.

BreastScreen Australia

The BreastScreen Australia Program is jointly funded by the Australian Government and state and territory governments. It consists of a network of dedicated screening and assessment services throughout metropolitan, rural and remote areas of all Australian states and territories. These services can be fixed or mobile and provide free two-yearly mammographic screening and follow-up of any suspicious lesions identified at screening to the point of diagnosis of breast cancer. The program is aimed specifically at women aged 50–69 years of age without symptoms, although women aged 40–49 years and 70 years and older may attend for screening. Women may attend without a doctor's referral.

In addition, recruitment and reminder systems are used to promote screening and rescreening among women in the target group once every two years.

A comprehensive system of accreditation is used to ensure that all BreastScreen Australia services operate under a common set of standards. Each service is assessed regularly by an independent team to ensure that the service provided complies with national standards.

The proportion of women in the target age group who were screened under the BreastScreen Australia program in a two-year period rose from 52.3% in the two-year period 1996–1997 to 57.1% in 2001–2002 (Table 6.25). Age-standardised participation rates for women in the target age group in major cities (55.6%) and very remote areas (47.9%) were lower than the national rate of 57.1%. Higher than the national rate were inner regional areas at 59.7%, outer regional areas at 60.7% and remote areas at 60.9% (Figure 6.10). Women in the target age group with the highest socioeconomic status had the lowest age-standardised participation rate (53.7%) in 2001–2002. In contrast, women with the lowest socioeconomic status had the highest participation rate (63.9%) (Figure 6.11).

Table 6.25: Women screened in each two-year period, 1996–1997 to 2001–2002

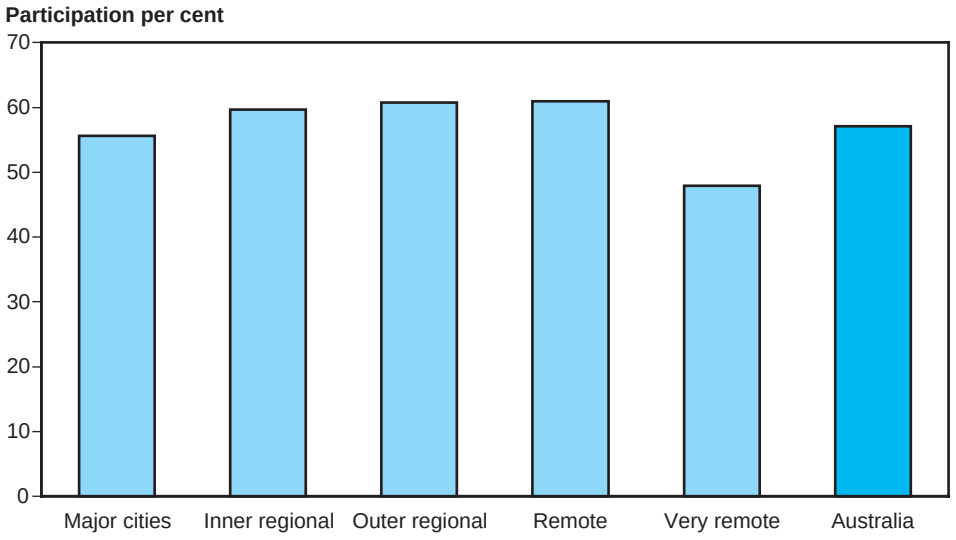
	1996–1997	1997–1998	1998–1999	1999–2000	2000–2001	2001–2002
BreastScreen Australia						
All ages 40 years and over	1,240,885	1,367,759	1,452,263	1,496,417	1,567,544	1,611,262
Target population (ages 50–69)	844,607	921,283	975,258	1,011,394	1,063,479	1,102,227
Participation rate for target population (%)[(a)]	52.3	54.3	55.6	55.9	56.9	57.1
National Cervical Screening Program[(b)]						
All ages 20 years and over	2,630,235	2,721,650	2,777,324	3,314,787	3,331,408	331,013
Target population (ages 20–69)	2,563,107	2,653,504	2,716,364	3,244,329	3,262,931	3,262,574
Participation rate for target population (%)[(a)]	60.8	62.4	63.4	61.3	61.0	61.0

(a) Participation rates are age-standardised to the 2001 total Australian population.

(b) The Queensland Health Pap Smear registry began in February 1999, so the cervical screening data presented here exclude Queensland.

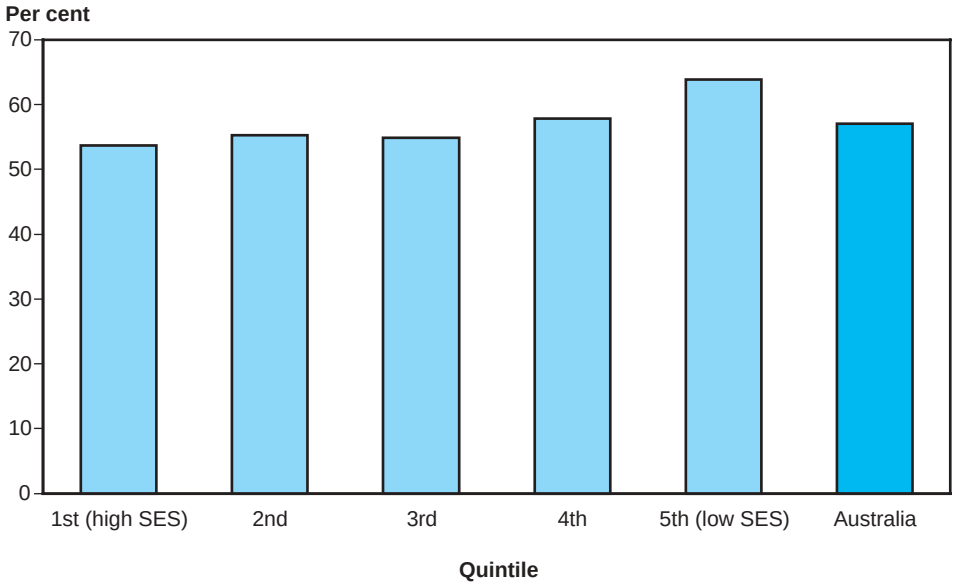
n.a. Not available.

Source: AIHW analysis of state and territory Cervical Cytology Registry data and BreastScreen Australia data.



Source: AIHW analysis of BreastScreen Australia data.

Figure 6.10: Participation of women aged 50–69 years in BreastScreen Australia by region, 2001–2002



Source: AIHW analysis of BreastScreen Australia data.

Figure 6.11: Participation of women aged 50–69 years in BreastScreen Australia by socioeconomic status (SES), 2001–02

National Cervical Screening Program

Screening to detect abnormalities of the cervix has been available for Australian women since the 1960s. Until the early 1990s this screening was largely unstructured, with no agreement on the screening target group or the best interval between screens. Since then it has become progressively more organised and in 1995 the program became known as the National Cervical Screening Program.

Unlike breast screening, cervical screening in Australia does not operate through a separate dedicated screening and assessment service. Instead screening services are provided as part of mainstream health services, with approximately 80% of Pap smears performed by GPs. Cervical screening is funded mainly by Medicare (61%) with the remainder funded by Australian government contributions through special purpose payments to state and territory governments (23%) and these governments' own revenue sources (16%).

The National Cervical Screening Program has both national and state and territory components. Although policy is usually decided at a national level, coordination of screening activity mainly happens at a state and territory level.

Cervical cytology registries operate in all states and territories. The major functions of the registries are to:

- remind women to attend for screening
- ensure the follow-up of women with abnormal Pap smears
- provide cervical screening histories to laboratories and clinicians to aid reporting and management
- monitor the effects of initiatives to improve participation by women in screening.

The Australian recommendation is for all women who have been sexually active at any stage in their lives to have a Pap smear every two years until they reach the age of 70 years. Screening may cease at the age of 70 for women who have had two normal Pap smears within the last five years. Women over 70 years who have never had a Pap smear or who request a Pap smear are also screened. However, for reporting purposes the target group is taken to be all women aged between 20 and 69 years who have not had a hysterectomy.

The proportion of women in the target age group who were screened under the National Cervical Cancer Screening Program in a two-year period rose from 60.8% in the period 1996–1997 to 63.4% in 1998–1999 before falling to 61.0% in 2001–2002 (Table 6.25).

Childhood immunisation

The Australian Standard Vaccination Schedule is recommended by the National Health and Medical Research Council. The purchase of most vaccines in the Australian Standard Vaccination Schedule is funded by the Australian government (with pneumococcal vaccine, funded for all children since June 2004, and inactivated polio vaccine and varicella vaccine not funded). Delivery of vaccines and program implementation are the responsibility of the states and territories. The Australian Standard Vaccination Schedule includes vaccines recommended for children against diseases such as measles, rubella, diphtheria, tetanus, pertussis, meningococcal disease and hepatitis B (see Chapter 3).

The national childhood vaccination activities include the Australian Childhood Immunisation Register (ACIR), which is administered by the Health Insurance Commission. It records details of vaccinations given to children under the age of 7 years who live in Australia, based on reports of each completed schedule milestone, for which providers are paid a reporting fee.

Nationally, GPs are the major childhood vaccine providers but there is considerable variation among jurisdictions in the proportion of vaccines delivered in the private and public sectors. In 2002–03, there were over 4 million vaccinations recorded by the ACIR (Table 6.26). The majority (71.2%) were provided by GPs, although this varied from state to state. Local government councils (16.1%) and community health centres (9.1%) administered a substantial proportion of vaccinations, particularly in Victoria for the former, and in the Australian Capital Territory and the Northern Territory for the latter.

Table 6.26: Immunisation episodes by state and territory and provider type[(a)], 2002–03

Provider type	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
				Episodes					
Local government council	73,857	443,039	55,375	22,368	43,595	11,249	0	0	649,483
State/territory health department	0	0	93	20,978	271	0	130	205	21,677
Royal Flying Doctor Service	419	0	2,737	0	473	0	0	0	3,629
General practice	1,105,645	561,753	668,084	241,921	190,486	77,776	20,122	2,940	2,868,727
Public hospital	17,918	5,036	27,915	23,641	3,552	209	248	4,999	83,878
Private hospital	6	3	128	0	0	105	0	533	775
Aboriginal health service or worker	8,285	3,169	13,260	2,841	1,532	0	0	6,040	33,127
Community health centre	108,652	9,680	55,071	62,754	39,833	887	37,169	52,483	366,663
Total	**1,312,782**	**1,002,704**	**822,666**	**374,503**	**279,742**	**90,226**	**57,706**	**67,213**	**4,028,036**
				Per cent					
Local government council	5.6	43.3	6.7	6.0	15.6	12.5	0	0	16.1
State/territory health department	0	0	0	5.6	0.1	0	0.2	0.3	0.5
Royal Flying Doctor Service	0	0	0.3	0	0.2	0	0	0	0.1
General practice	84.2	54.9	81.2	64.6	68.1	86.2	34.9	4.4	71.2
Public hospital	1.4	0.5	3.4	6.3	1.3	0.2	0.4	7.4	2.1
Private hospital	0	0	0	0	0	0.1	0	0.8	0
Aboriginal health service or worker	0.5	0.3	1.6	0.7	0.6	0	0	9.0	0.8
Community health centre	8.3	1.0	6.7	16.8	14.2	1.0	64.4	78.1	9.1
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

(a) Other and unknown provider types are included in the column totals. Unknown state or territory is included in the row totals.

Source: Australian Childhood Immunisation Register, HIC 2004.

The national immunisation program has introduced a range of funding arrangements and financial incentives to increase the proportion of children immunised. The level of immunisation (which rose initially and has now plateaued; see Chapter 3) has been regularly monitored using ACIR data, and modifications have been made to the program and payments.

The incentives for increased immunisation and reporting have included the General Practice Immunisation Incentives Scheme, which was introduced by the Australian Government in 1998. The scheme includes service incentive payments, which are paid on the completion of each immunisation schedule in accordance with the approved Australian Standard Vaccination Schedule. In addition, outcomes payments are paid quarterly to general practices that achieve target levels of immunisation for children who attend the practice. In 2001–02, $19.4 million was paid in service incentive payments (4.9% increase over the $18.5 million in 1999–00), and $16.3 million in outcome payments (22.6% increase over the $13.3 million in 1999–00).

Two incentives for parents were introduced in 2000. The means-tested Maternity Immunisation Allowance is payable for children from 18 months of age either when all immunisations due by that age have been recorded on the ACIR, or when there is a documented medical contraindication (reason against use) or conscientious objection to immunisation. The Child Care Benefit, which is available to partially reimburse expenditure on approved or registered child care, is also available only with evidence of either up-to-date immunisation on the ACIR, or contraindication or conscientious objection.

Needle and syringe programs

Needle and syringe programs operate in all states and territories of Australia, funded as a public health measure to reduce the spread of bloodborne viral infections such as HIV and hepatitis C among injecting drug users (Health Outcomes International et al. 2002). They provide a range of services that include provision of sterile injecting equipment and disposal facilities, education and information on reducing drug-related harm, referral to drug treatment, medical care, and legal and other social services. The aim of providing injecting equipment is to prevent its shared use, which can lead to the transmission of infection.

The nature of needle and syringe programs varies among the states and territories. Some are government-run and others are run by non-government organisations. Some operate as primary outlets, specifically established as stand-alone needle and syringe programs. Others operate as secondary outlets, incorporated into other health services, such as emergency departments. Others operate as mobile or outreach services, or make needles and syringes available through vending machines. Needles and syringes are also available through pharmacies, commercially and, in New South Wales, through a government-sponsored scheme.

In 1999–00, an estimated 31,848,000 needles were distributed by needle and syringe programs in Australia. Estimated expenditure on them was $22.7 million, $19.7 million by governments, and $3.0 million by consumers (Health Outcomes International et al. 2002).

Box 6.6: The Sydney medically supervised injecting centre

The Sydney medically supervised injecting centre (MSIC), located at Kings Cross, opened for client services in May 2001. It provides on-site medical consultations and assessments, health education, and testing for bloodborne viruses and sexually transmissible diseases as well as needle and syringe programs. Referrals for drug and alcohol detoxification and rehabilitation services are also provided. The main aim of the MSIC is to reduce harm associated with illicit drug use by supervising injecting episodes that might otherwise occur in less safe circumstances, such as public places or alone (Sydney MSIC 2004).

An evaluation report of the trial operating period to October 2003 found that the MSIC positively contributed to the management of drug overdoses (within the MSIC), improved client injecting-related health and decreased the number of syringe counts in the local area (MSIC Evaluation Committee 2003). During the 18-month trial, 3,810 individuals registered to use the MSIC; 73% were male and their average age was 31 years. Clients made 56,861 visits to the MSIC with an average of 15 visits per client, and a range of 1 to 646 visits. Heroin was the drug most frequently injected (61% of visits) followed by cocaine (30% of visits). A total of 409 drug-overdose incidents requiring clinical management occurred at the MSIC, a rate of 7.2 incidents per 1,000 visits; 80% were heroin-related overdoses.

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7 National health information and its development

Australia has a relatively comprehensive health statistics system. This is demonstrated by the vast amount of health statistics used in the previous chapters.

Since its inception in 1993, the National Health Information Agreement has provided the framework for cooperation between government agencies that has supported this statistical system. Under the Agreement, principles and mechanisms for endorsing national minimum data sets and statistical standards have been established. The Agreement was extended to May 2004 and is being reviewed. A set of national health information development priorities was developed by the National Health Information Management Group and was endorsed by the Australian Health Ministers' Advisory Council (AHMAC) in 2003.

In the most general terms, health information is important for the understanding of the health status of the population, the extent and nature of various health problems and their determinants and causes, the services and interventions to reduce these problems and their health outcomes. Health information and statistics are fundamental to developing effective health policies and programs, to coordinating treatments and care, and to empowering consumers. There is increased use of statistical indicators to monitor levels and changes in health status and the performance of the health programs and systems. This has resulted in a better understanding of the quality of current data and the need for improvements to them to support the indicators. Indicator sets are developed or being developed for the system as a whole (for example for the national health performance report) and for a variety of health areas or sectors, for example each of the National Health Priority Areas, environmental health, hospitals and public health.

The sources of health statistics include administrative data systems such as those for hospitals, disease registers and surveys such as the various forms of household surveys and telephone surveys. A number of national minimum data sets that support performance indicators have been specified and developed, and administrative systems are being designed and organised so that they can generate agreed national minimum data sets. There have also been major improvements in health survey programs conducted by the Australian Bureau of Statistics (ABS), the Australian Institute of Health and Welfare (AIHW), health departments and others. While there are still significant gaps and some inconsistencies, these surveys are providing relatively comprehensive data on the health conditions and behavioural health risk factors of Australians. Major health surveys are conducted at regular intervals and these are providing time series data.

Significant work has been done to develop a national network of electronic health records for use by health providers and consumers. The Health*Connect* project, initiated by the Australian, state and territory governments in 2001, has completed its first phases of work, assessing user requirements and specifying preliminary system designs. Several trials are being conducted. Electronic health record systems have the potential to improve the provision of health statistics as well as clinical management if the systems incorporate statistical requirements as an integral part.

To improve the management of information technology and statistical issues in health information, a new national governance structure was developed and put in place in 2003. Two new high-level bodies were established under AHMAC. These two bodies will have responsibility for advising on and managing all aspects of health information management and associated information and communications technology activities.

This chapter discusses these aspects of the national statistical system.

7.1 New governance for national health information

In 2002, the Australian Health Care Agreements were reviewed, and new agreements were signed in 2003. As part of the review, a report by the Review's Reference Group of Information Technology, E-health and Research proposed that changes in governance arrangements were needed to increase the effectiveness of the investment in information management and technology. The report recognised the importance of information as an enabler for improvements in health service delivery. A new governance arrangement was proposed for consideration by AHMAC and the Australian Health Ministers' Conference (AHMC).

On 31 July 2003, AHMC endorsed the creation of two new bodies—the Australian Health Information Council (AHIC) and the National Health Information Group (NHIG)—to provide leadership on information management and technology, and to coordinate advice to AHMAC and AHMC.

The key role of AHIC is to provide independent advice to AHMC, through AHMAC, on long-term directions and national strategic reform issues, including views from consumer, clinical and private stakeholders and experts.

The NHIG has been established to advise AHMAC on planning and management requirements, and to manage and allocate resources to national health information projects and working groups. Membership of the NHIG is jurisdictional, with relevant agencies (including AIHW) having observer status.

The new arrangements have been designed to enable more-coordinated, coherent governance of national data collection, data standards and related information communications technology. The aim is that statistical aspects of information management and technical aspects of information management and their related standards work be brought together in a more integrated way.

To support the work program of the NHIG a number of standing committees have been established. The Statistical Information Management Committee (SIMC) replaces the

National Health Information Management Group and has responsibility for statistical matters. The Health Data Standards Committee (HDSC) replaces the National Health Data Committee and assumes responsibility and custodianship of the *National Health Data Dictionary*, along with responsibility for health terminology and classification.

Classifications and terminologies need to meet both statistical and clinical requirements. Recognising the importance and the size of the field of health terminology and its relationship with classification, a Classification and Terminology Working Group was established under the HDSC to advise on Australian adoption of standard classifications and terminologies and to link Australian work in this area with international efforts.

Two information technology committees have been created under the NHIG—the Information and Communications Technology Standards Committee that deals with communication and messaging standards, and the Information and Communications Technology Committee that deals with software and hardware matters.

The new governance arrangements also include time-limited working groups that are established for specific purposes. Related committees and working groups work closely through joint membership and through business rules.

The National Health Information Agreement that was signed in 1993 and propelled the considerable development of national health statistics is now being re-drawn to reflect the new arrangements.

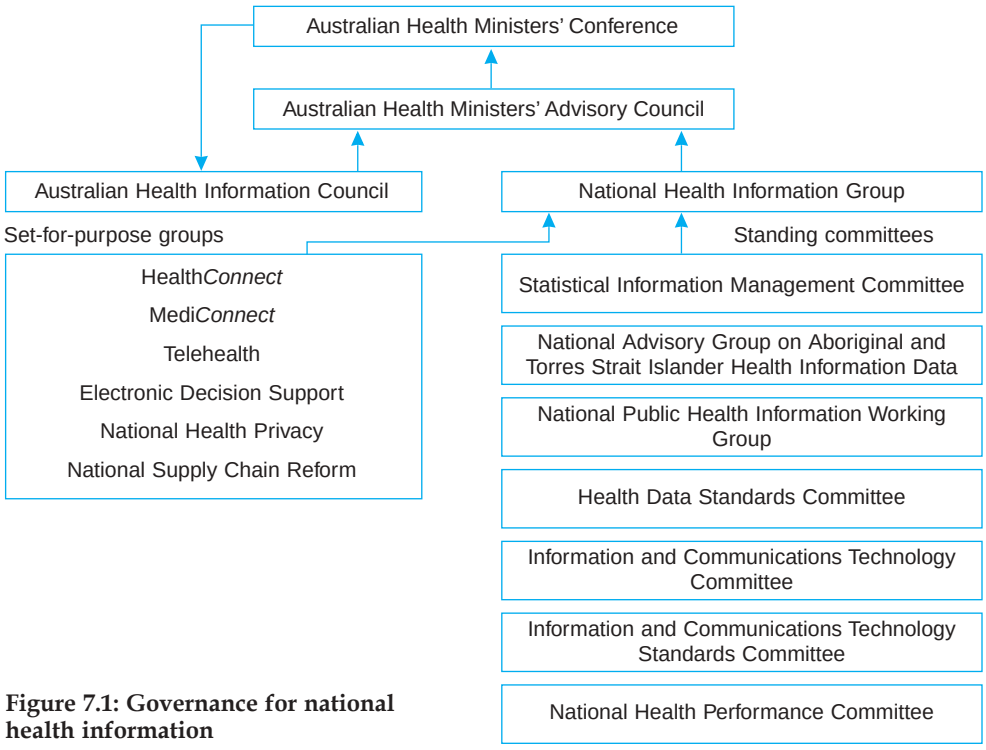

Figure 7.1: Governance for national health information

7.2 National health information development priorities

While Australia's health statistics system is well established, there remain a number of areas where improvements are needed. There are also new and emerging issues that require attention. In 2001–02, the National Health Information Management Group developed 10 priorities for health information development and these were endorsed by AHMAC (NHIMG 2003). They are described below.

Indigenous health

Improvements are being made to the quality and quantity of statistics on Indigenous health. An Indigenous supplement to the ABS National Health Survey in 2001 collected data on the health status of Indigenous persons in remote and non-remote areas of Australia. In 2004, the ABS will be collecting this information through the Indigenous Health Survey, which will be run in conjunction with the National Health Survey using a much larger sample. This survey will provide national and state/territory estimates of indicators of health status such as self-reported disease patterns and risk factor behaviours. In 2002, the ABS conducted its first six-yearly Indigenous Social Survey that collected health data along with other information on the various dimensions of economic, social and cultural circumstances.

Efforts are also being made to improve Indigenous identification in data collections on the use of health services. Identification is self-reported. National standards for Indigenous identification in hospitals have been adopted. However, the extent of this identification varies considerably between states and territories as well as across collections.

Estimates of basic Indigenous health status measures, such as birth and death rates, infant mortality rates and life expectancy, are affected by the quality of population and birth and death registration data that varies between states and territories. The ABS publishes experimental estimates of Indigenous death rates and life expectancy based on models (ABS 1998), but the reliability of these estimates is difficult to establish. Better quality data and better use of existing data (such as data linkage between vital and census records) are needed to verify and improve the assumptions underlying these models. Similarly, data on Indigenous health service use are not of consistent quality across the states and territories.

To further improve Indigenous statistics, AHMAC has established a National Advisory Group for Aboriginal and Torres Strait Islander Health Information and Data. Its role is to implement the National Indigenous Health Information Plan, in particular to improve the quality of Aboriginal and Torres Islander population estimates and vital statistics (AHMAC 1997). At the present state of development, the state of Indigenous health is well described for some parts of Australia, but national trends are not reliably discernible. Care is needed to avoid false conclusions.

Integration of services

To support the integration of health and related services, all data from the relevant sectors need to complement each other and be comparable. For example, to develop an integrated system of aged care, comparable data are required to help understand the complex flow of consumers of health care between hospitals, residential aged care and the community.

Much of Australia's current health statistics, however, are sector-specific, reflecting the timing of their development and the sectors' special data requirements. These separate data collections need to be harmonised and new data collections need to include comparability as one of their objectives.

Data of considerable detail have been available for some time from health institutions, for example on admitted patients in hospitals and residents in residential aged care. These are now being supplemented by the development of comparable data on services provided in other settings; for example, patients in hospital emergency departments, community-based mental health, palliative care, and alcohol and other drug treatment services. A regular AIHW survey of general practitioners, the BEACH program, provides data on the health conditions of their patients and the services they provide in response.

Despite recent efforts, there is still a great demand for further work to harmonise existing data collections and to develop data from other sectors such as rehabilitation and many allied health services. The development of comparable data is assisted by the existence of the *National Health Data Dictionary*, which provides standards in definitions, classifications and collection methods. In addition, the use of more than one data set together to support integrated health services also requires the capability and ethically agreed protocols to link data sets, including protocols for the construction and use of unique patient identifiers.

Safety and quality in health care

The National Health Information Management Group's publication on health information development priorities noted that reliable national information on the safety of health services was not readily available (NHIMG 2003:18). For example, there are no accurate statistics on the number of preventable adverse events in Australian hospitals. Hospital data do include information on diagnosis and external causes of injuries and poisoning that provide some indication that an adverse event might have occurred. However, the data are incomplete as some adverse events can be coded to categories that may not indicate such an event, for example accidental poisoning (AIHW 2002:294). Data on maternal mortality and morbidity are not regularly reported and are inadequately analysed, although there are recent efforts to make improvements in this area of work.

The lack of data on safety in health care is more severe in other sectors such as aged care and community-based health care, including general practice. In 2000, AHMC established the Australian Council for Safety and Quality in Health Care to lead national efforts to improve the safety and quality of health care provision in Australia. The Council releases a regular national publication on patient safety (ACSQHC 2003). While efforts are focused on what providers and consumers should do to improve clinical safety, one of the Council's objectives is to promote high-quality information collection and analysis to understand the nature and level of adverse events to inform clinical safety. This includes supporting all jurisdictions to report on a common set of sentinel events, making better use of hospital data to measure adverse events and supporting the development of electronic health information to provide support for clinical decisions and better communication between clinicians.

Information technology and health

Rapid advances in information and communications technology are changing the way health services are provided. These advances can significantly improve the collection, transmission and retrieval of clinical and demographic information to enable a more seamless continuity of care for better health outcomes.

A research program is being undertaken by the Health*Connect* Program Office, an initiative of AHMC, to study the feasibility of establishing a network of national electronic health records that makes use of advanced technology. Although the primary objectives are for clinical use, such a network has the potential to provide statistics for research and policy use. Some of the statistical issues in the use of information from electronic health record systems are discussed later in this chapter.

Population health and equity and access

Recognising that good health is not equally shared in the population, monitoring the health status of and access to health services by different population groups is a focus of all Australian jurisdictions. The National Public Health Partnership has established a working group, the National Public Health Information Working Group, to develop and promote the collection and analysis of routine health monitoring data that are nationally comparable and that can be used to monitor population health across the country. To this end, the National Public Health Information Working Group released a second National Public Health Information Plan. The priorities of the plan include the development of surveillance and monitoring strategies for communicable diseases and their risk factors, as well as developing environmental indicators (NPHIWG 2004).

The National Health Priorities Action Council (NHPAC) also promotes the use of indicators to monitor the progress of government-initiated strategies in the priority areas. These strategies all include, as a key aim, the reduction of inequality in health status and access to services.

Large-scale national surveys, such as those conducted by the ABS and AIHW, state surveys using computer-assisted telephone interview (CATI) techniques as well as disease registers maintained by the AIHW, all provide data that can be used to analyse health inequalities. These collections provide data on health behaviours such as alcohol consumption and smoking as well as self-reported and measured weight and height. Routine health administrative data, such as hospital data, provide information on the differences in service use by population groups.

Work is needed to harmonise data from ABS surveys and state-based CATI health surveys and to agree on a set of national indicators of health risk factors. The particular areas of concern are measures of physical activity and inactivity, the inclusion of teenagers aged 14 to 17 years of age in measures of tobacco smoking and alcohol consumption, and the use of 'measured' data for height and weight in addition to self-reported data (AIHW 2003c).

However, there has not been an official national survey of sufficient size that collects biomedical samples to give reliable and accurate measurements of blood glucose, cholesterol levels and other key biomedical markers. Thus, in terms of the progressive stepwise approach to surveillance of non-communicable diseases proposed by the World

Health Organization (WHO) (Bonita et al. 2001), Australia has collected data on the first two steps, self-reported health behaviour and self-reported height and weight, but has not progressed to the third and final step of collecting national biomedical measurements.

Recognising that the lack of data on biomedical measurements is an information gap, the Australian Government Department of Health and Ageing, the AIHW and the ABS conducted a pilot study of such a survey in 2003 (Box 7.1). The pilot study was based on a proposed linking of the measurement survey to the ABS National Health Survey and involved the taking of blood samples in pathology laboratories. The pilot study achieved an unacceptably low response rate (proportion of people agreeing to take part), and revisions to the protocols and re-testing will be necessary to ensure a successful survey of this type.

Box 7.1: Pilot study of an Australian Health Measurement Survey (AHMS)

Background

In 2002, AHMAC endorsed a pilot study of a survey to collect information on physical and biomedical measures of health status and risk factors with a view to conducting the survey in conjunction with the 2004–05 ABS National Health Survey, subject to adequate response rates and availability of funding.

This pilot study involving about 970 adults and children (aged 2–74 years) was conducted in Adelaide and Victoria in early 2003. The study's main aims were to test operational aspects and response rates, including the effect on response rates of the requirement to fast for a blood test.

The pilot study

There were three main stages in the pilot:

- *a standard National Health Survey interview in the home*
- *a second home visit to take physical measurements and collect other data*
- *a visit to a pathology collection centre for the collection of blood and urine samples.*

Outcome

Operationally, the survey protocol worked well although response rates were not high. Around 64% of eligible people signed a consent form to participate in the AHMS. Just under 60% of those invited to attend a pathology collection centre did so, and the response rate was higher (although the difference was not statistically significant) among those asked to fast (62%) than those not asked to fast (54%).

Taking into account the households that did not respond to the National Health Survey component and those individuals who declined to be contacted about participating in the health measurement component gives a 'bottom-line' response rate of 23% for the blood sampling.

Because the response rate was relatively low and there was a lack of identified funding for further development for the main survey, it was decided not to proceed with the proposal to link a health measurement survey to the 2004–05 ABS National Health Survey. The case for a health measurement survey is still strong, however, and opportunities are being sought for linking it with current government priorities.

Health labour force

Data on registrable medical and allied health professionals are produced by AIHW to meet requirements for health labour force planning. Labour force planning is coordinated by the Australian Health Workforce Officials' Committee. Important structural changes are occurring to the health labour force, and there are significant and long-standing labour shortages in many health professions. These add to the requirements for more detailed and more up-to-date labour force data.

In recent years, as policy interest in this area has increased, all jurisdictions are working to improve the timeliness and quality of data. The nursing labour force collection has been redeveloped and national processing put in place. Similar work in other labour force collections is planned.

Performance of the health system

The National Health Performance Committee (NHPC) has finalised the 2003 report on Australia's health sector performance (NHPC 2004). This is the second report based on the National Health Performance Framework adopted in 2001. The framework consists of three tiers: health status and outcomes, determinants of health and health system performance (NHPC 2001). Indicator sets were selected to measure aspects of each of the three tiers and in 2003 the set was revised and expanded.

While the NHPC framework and the indicator set have been developed for the NHPC national report, their potential is being promoted for use by states and territories and by other bodies. The NHPC intends to publish its national reports every two years and, in between, to use the framework to report on special interest areas. The NHPC also intends to extend its work into benchmarking best practices in acute care and primary health care.

Activities of the NHPC help to identify data gaps and comparability problems, and have an effect on future data development plans.

Standards and classification

Under the National Health Information Agreement, considerable improvements have been made in developing and using common definitions and classifications of data items. This improvement has been particularly significant in supporting the establishment and use of national minimum data sets such as the Hospital Admitted Patient Care and Community Mental Health data sets. New minimum data sets are introduced as required and have expanded the *National Health Data Dictionary*.

To help develop an electronic health record network for clinical care purposes, the *National Health Data Dictionary* and its repository, the AIHW Knowledgebase, were reviewed and expanded. As part of this expansion, the HDSC (previously the National Health Data Committee) worked with Standards Australia and accepted for inclusion in the *National Health Data Dictionary* a specification of data elements that can help to identify health clients. Standards Australia is similarly developing specifications for identifying health service providers.

The expansion of the *National Health Data Dictionary* has also included disease-specific standard data set specifications for use by clinicians. Two such data set specifications were accepted as standards and were published in Version 12 of the *National Health Data Dictionary* in 2003—the National Cardiovascular Disease (Clinical) and the Diabetes (Clinical) data set specifications.

The OECD continues to refine its international System of Health Accounts. This system is designed to provide a standard conceptual basis for reporting expenditure on health care by functions of care, providers of health care and sources of funding (OECD 2000). An OECD publication presenting results of national accounts that employ the standard is expected to be released in 2004, and will provide guidance for further improvements in data quality.

Work on standard health classifications has also progressed. Australia is committed to using international standards where they are sufficient to Australia's needs. The International Classification of Diseases (ICD) and the International Classification of Functioning, Disability and Health (ICF) are the two reference classifications in the WHO Family of International Classifications (WHO-FIC), and they are also included in the Australian Family of Health Classifications. Australia has adopted the latest version of the ICD for the compilation of mortality and morbidity statistics, with an Australian modification of the ICD-10—the ICD-10-AM—being used for Australian hospital statistics. Following World Health Assembly endorsement of the ICF, AIHW has developed an Australian user guide to promote the use of the ICF in Australia (AIHW 2003a). Australia is an active participant in the WHO Collaborating Network on the Family of Health Classifications. Australian work in classifications, through the Classification and Terminology Working Group, is expected to contribute to the WHO Collaborating Network program. In October 2003, the International Classification of External Causes of Injury, the Anatomical Therapeutic Chemicals Classification and the ISO 9999 Technical Aids for Persons with Disabilities were included in the WHO-FIC. It is expected that these will also be included in the Australian Family of Health Classifications.

Management of health information

The 2002 Health Information Development Priorities (NHIMG 2003) noted that the basic elements of a good-quality statistical system include best practice guidelines, protocols and standards for data development, collection, compilation, analysis and dissemination. It also noted that there are significant community and professional concerns to ensure any use of electronic records and data linkage safeguards privacy and meets appropriate ethical guidelines.

The SIMC has begun a series of audits of the quality of national data collections against users' requirements and agreed data standards. An audit of the hospital Admitted Patient Care National Minimum Data Set was conducted in 2002–03 as the first of such audits. A planned revision of this national minimum data set will be informed by results of this audit as well as new requirements arising from the signing of the new 2003–2008 Australian Health Care Agreements. The National Perinatal Statistics National Minimum Data Set is being audited and the next to be audited will be the hospital Admitted Patient Mental Health Care National Minimum Data Set.

The National Health Information Agreement aims to reduce duplication in data collection and to ensure data collections complement each other. The complementarity among data collections is demonstrated in the consistent use of data definitions and classifications in many related data collections. One example is the ABS Survey of Disability, Ageing and Carers and the AIHW collection of service usage data provided under the Commonwealth/State Disability Agreement. Another is the AIHW National Drug Strategy Household Survey and the routine state and territory data collection on the use of alcohol and drug treatment services. In both examples, administrative data on service use can be analysed in the context of need that is indicated in the related surveys.

However, there is still some duplication in data collection. For example, states and territories provide essentially the same data on hospital admitted patient care to the Australian Department of Health and Ageing under the Australian Health Care Agreements and to the AIHW under the National Health Information Agreement. There is a duplication of effort and a likelihood of inconsistencies arising from differences in the data provided and data processing details, although both collections follow the specifications of the *National Health Data Dictionary*.

Managing data linkage is also a function of the National Health Information Agreement. Linking data from more than one source is becoming increasingly important as an analytical tool. At the AIHW, cancer incidence data are linked to death data to calculate cancer survival rates. In 2002–03 a project was conducted on the flow of people from hospitals to residential aged care services and vice versa using linked data (AIHW 2003d). A more detailed study of the movement of long-stay hospital patients is being undertaken jointly by the Australian Government Department of Health and Ageing and the Western Australian Department of Health. This work provides de-identified linked health data to Australian institutions for approved research projects. Ethics committee approval is required for each project.

The five-yearly National Census of Population and Housing is a very rich source of data that could be linked to other data to yield very important longitudinal epidemiological information. For example, linking census data to mortality data for the Indigenous population could yield a much better estimate of Indigenous mortality than relying on imperfect Indigenous data from death registration and population estimates. Also, linking Indigenous census records between two censuses could throw much light on the dynamics of Indigenous identification at censuses. Submissions have been made by various organisations to the ABS to retain census records for these and other epidemiological purposes.

The potential of using linked data for statistical and policy research is immense and the National Health Information Management Group (now SIMC) has developed guidelines for data linkage and for the use of linked data.

7.3 Health indicators

The availability of the considerable amount of quality health statistics in Australia has allowed the construction of many sets of health indicators to meet various requirements. In many cases, the need for indicators has driven the development and collection of data; in many others, indicators were developed using existing data. As

indicated above, the NHPC has selected a range of indicators to measure the performance of the whole health system. In addition to the NHPC indicators, various agencies and committees have selected indicators to measure the progress of their particular aspects of the health system.

Indicators on hospital performance are published by the AIHW in its annual *Australian Hospital Statistics* (AIHW 2004) and by the Steering Committee for the Review of Commonwealth/State Service Provision in its *Report on Government Services* (SCRCSSP 2004). The Australian Health Care Agreements 2003–08 also provide for the publication of indicators of hospital performance by the Australian Government Department of Health and Ageing.

Another important use of health indicators is the assessment of the expenditure on and burden of diseases. In 1994–95 the AIHW published the first Australian study of the direct expenditure on diseases. In 1995–96 the first study on burden of disease, containing estimates of years of life lost and non-fatal consequences of disease, was also published by the AIHW (AIHW: Mathers et al. 1999). The disease expenditure work has been updated by the AIHW and is reported in this publication. The burden of disease work is being updated jointly by the AIHW and the University of Queensland.

Indicators are also developed and used in many specific health sectors. In 2002, the National Public Health Partnership undertook a project to develop public health indicators for the regular health performance report by the NHPC. Further work is also being undertaken to refine and expand on this preliminary set of public health indicators (NPHP 2002).

The health conditions of the population and services provided in the National Health Priority Areas are also monitored routinely through the use of indicator sets that are developed and endorsed by the respective expert advisory groups of these priority areas. In the cancer priority area, indicators are developed for general monitoring and also for monitoring specific cancer screening programs. Indicators for each of the priority areas are reported in this publication and are summarised in the Appendix. Indicators for arthritis and musculoskeletal conditions, a new priority area identified in 2003 by AHMC, are also being developed. The National Health Priority Areas expert advisory groups are also developing indicators that track the progress of the strategies adopted. These indicators, called strategic tracking indicators, provide information on the development, implementation and outcomes of a strategy or program.

Indicators were also developed, and are used, for monitoring child and youth health. In 2002 AIHW published a comprehensive report on the health and wellbeing of Australia's children based on a framework of indicators endorsed by AHMAC. Similarly, in 2003, the AIHW published a corresponding report on Australia's youth. Both the indicator sets for children and youth were based on the National Health Performance Framework.

A discussion paper containing examples of environmental health indicators was issued by enHealth Council in 2002 (enHealth Council 2002).

These uses of statistical health indicators illustrate the importance being placed on objectively measuring progress. The need for indicators is a driving force for the development of health data sets and statistical infrastructure in Australia.

7.4 Information development in several areas

The past two years have seen considerable effort in the development of new data sets or the revision of existing data sets to provide quality data for administering health programs and services. Three national minimum data sets were developed or revised, and were endorsed by the National Health Information Management Group under AHMAC. And, for the first time, two clinical data set specifications for use by clinicians—diabetes and cardiovascular diseases—and a data set specification of data items to be used for client identification have also been developed and endorsed for inclusion in the *National Health Data Dictionary* (NHDC 2003b). Incorporating clinical data standards into the *National Health Data Dictionary* will help the standardisation of terms used in clinical settings and should help improve the delivery of patient care and the production of management information and national statistics, thus supporting the electronic health record agenda.

These developments are described below.

Hospital emergency department

While comprehensive national data on hospital care provided to admitted patients are available and being improved, only very limited data are available nationally on care provided to non-admitted patients. The lack of comprehensive non-admitted care data has been a barrier to understanding the complex interface between admitted hospital care, emergency hospital care, and community general medical practice. In 2001–02 the Commonwealth Department of Health and Ageing, in conjunction with the states and territories, initiated a project to develop a standard set of data elements on hospital emergency care. Important data elements include the triage category of the patient, waiting time to service delivery, duration of emergency care episode, and information about arrival mode and separation destination. An important data element not yet included in the data set is the nature of the health problems that caused the hospital emergency visit. This data element is being developed for inclusion in 2004–05.

This data set has been implemented from July 2003 in principal referral hospitals, specialist women's hospitals and children's hospitals, and large hospitals in major cities and regional and remote areas.

Community mental health

Since 1993, under the National Mental Health Strategy, Australia has undertaken a national approach to mental health reform. A major area of reform has been the reduction and closure of institutions and their replacement by residential and non-residential care in the community. During this time, there has been substantial development of mental health information covering community-based care. Data on community mental health establishments became available in 1998–99 and data on their patients were collected for the first time in 2000–01. The National Minimum Data Set for Residential Mental Health Care was developed in 2002 and 2003 to collect information on staffed community-based residential services. This data collection is scheduled to start in July 2004.

During the development process, relevant data definitions contained in the hospital-based Admitted Patient Care National Minimum Data Set were reviewed and related

data items harmonised with those in the residential mental health care data collection. Data definitions and collection methods were designed to take into account the special nature of residential mental health care, for example extended stays.

Medical indemnity

Medical indemnity for health professionals has become a prominent policy issue over recent years. However, despite the high level of policy and public interest in medical indemnity, there is relatively little information available about the number, nature and size of medical indemnity claims in Australia.

At the Medical Indemnity Forum in April 2002, AHMC agreed that urgent work was needed on a range of medical indemnity issues, including the establishment of a 'national database for medical negligence claims', to help determine future medical indemnity strategies. The Medical Indemnity Data Working Group was convened under the auspices of AHMAC and was commissioned to develop a national medical indemnity collection for the public sector.

The primary purposes of the collection are to:

- obtain ongoing information on medical indemnity claims and their outcomes;
- provide national data to identify trends in the nature, incidence and cost of medical indemnity claims; and
- provide data to assist the development of measures to minimise the incidence of medical indemnity claims and the associated costs.

In late 2003, the health authorities in all states and territories started sending data to AIHW for national collation and reporting. It is intended that, in future, the scope of the collection may be broadened to include private sector indemnity claims handled by medical defence organisations.

Alcohol and drugs treatment

The Alcohol and Other Drug Treatment Services National Minimum Data Set covers community-based and non-admitted hospital-based alcohol and drug services in all states and territories. The data set was developed in 1998–99 after reviewing existing data collection practices and procedures. In December 1999, the National Health Information Management Group endorsed the Alcohol and Other Drug Treatment Services National Minimum Data Set and data collection began on 1 July 2000. Data elements of the data set include characteristics of the clients, including type of drugs used, type of treatments provided, duration of treatment and information about the agency that provided the service. Data from this collection can be analysed together with data from the National Drug Strategy Household Survey to shed some light on the extent that treatment services meet the potential demand.

In 2002–03, a review of the data elements was undertaken based on the experience in the collection of the data and changes in requirements. Changes were made to the categories of principal drugs of concern, descriptions of treatment types and reasons for cessation of treatment. These changes were endorsed and the new version of this data set was included in the *National Health Data Dictionary*.

Health care client identification

The ability to uniquely identify individuals is critical to the provision of care. Accurate client (and provider) identification is crucial to any promotion of an e-health environment.

Australia does not have a population register and a unique personal identification system. A number of identification systems exist in different sectors (for example the tax file number system for taxation purposes and the Medicare number system for Australian Government reimbursement of medical and pharmaceutical fees). The Health Care Client Identification Data Set Specification is a standard set of data elements that would assist positive client identification in view of the lack of a unique personal identification system.

Standards Australia has published a standard called Health Care Client Identification in 2002 (SA 2002). In conjunction with the HDSC, this standard was updated and revised by Standards Australia in 2002–03 and was incorporated into Version 12 of the *National Health Data Dictionary*. The standard consists of a set of data elements including names, addresses, date of birth and other personal characteristics of patients. The data set does not include biometric elements.

A related data set specification on health service provider identification is being developed by Standards Australia International in cooperation with the HDSC.

Diabetes clinical data

There has always been recognition that disease-related epidemiological data, in particular outcomes data, can help to inform clinical management. In 1993, a set of data elements was agreed at a New South Wales Diabetes Outcomes Workshop to form the initial diabetes clinical data set. This was later modified to be consistent with the 1996 New South Wales Diabetes Clinical Management Guidelines. Based on the specifications of this data set, collections were undertaken between 1998 and 2002 for both clinical, audit and benchmarking purposes. Further modifications were made to the specification and the resultant data set specification was endorsed in 2003 for incorporation in the *National Health Data Dictionary*.

The Diabetes (Clinical) Data Set Specification contains more than 40 clinical data elements. Many of these elements are diabetes-specific and some are general and also relevant to other diseases, for example risk factors such as excessive weight, raised blood glucose and high cholesterol levels (NHDC 2003a). These general clinical data elements are in addition to the usual demographic and service administration-related data elements. The National Diabetes Data Working Group, which developed the data set, is promoting its use among clinicians.

Cardiovascular diseases clinical data

The Cardiovascular Disease (Clinical) Data Set Specification was developed by a working group called the CV-Data Working Group, initiated by the National Heart Foundation of Australia and the Centre for General Practice Integration Studies at the University of New South Wales. The development is supported by a range of cardiac and related clinical groups such as kidney and diabetes specialties as well as general practice.

The goal was to develop a nationally recognised clinical minimum cardiovascular data set that would support quality cardiovascular care. The data set comprises evidence-related data elements relevant to the prevention and outcomes of vascular health. These include definitions of patients' demographics, cardiovascular disease risk factors (behavioural, biomedical, social), clinical history and management characteristics. The data set also includes definitions relating to diabetes and renal impairment, in recognition of the strong relationships between these conditions and cardiovascular diseases.

Certain general clinical data elements exist in both the diabetes and the cardiovascular disease data set specifications. These have been made consistent between the two. After considerable consultation among cardiovascular clinicians, the Cardiovascular Diseases (Clinical) Data Set Specification was finalised and incorporated into the *National Health Data Dictionary* in 2003. Further data development work is being undertaken in this field, and a clinical data set specification is being developed for acute coronary syndrome (heart attacks and unstable angina) treated in hospitals.

7.5 Major national survey initiatives

ABS surveys

The ABS has a comprehensive household survey program on health status and health service use. Following a review of its household survey program, the ABS has introduced an expanded program of surveys that collect health data. All health-related surveys collect information on individual demography and geography.

The 2001 National Health Survey collected information about the health of the population including long-term medical conditions and recent injuries, the use of health services, health-related aspects of lifestyles, and demographic and socioeconomic characteristics. The survey covered both urban and rural areas in all states and territories but sparsely settled areas were excluded. The next survey is scheduled for 2004–05.

The ABS has previously collected health information on the Indigenous population in 2001 as a supplement to the National Health Survey. A larger sample is planned for 2004–05 with the commencement of a six-yearly Indigenous Health Survey to coincide with every second National Health Survey. A disability module was included in the Indigenous General Social Survey conducted in 2002.

The Survey of Disability, Ageing and Carers (six-yearly) covers activity limitations and participation restrictions resulting from health conditions as well as information on the use of formal and informal care. This survey gives estimates of the prevalence of disability. The most recent survey was conducted in 2003 (the fifth in the series) with results expected in 2004. Because of the limitations of the size of the sample and the relatively low prevalence levels of disability, the survey does not generate accurate estimates of disability at small area levels, including smaller states and the two territories. The ABS is investigating ways to collect some disability information from the next Census of Population and Housing in 2006 to assist planning of disability services at local levels.

Along with other social data, the four-yearly General Social Survey also includes questions on self-assessed health status and the six-yearly Indigenous Social Survey, first conducted in 2002, contains questions on smoking, alcohol consumption, substance use and disability.

AIHW and other national surveys

In addition to ABS surveys, the AIHW, on behalf of the Australian Government Department of Health and Ageing, conducts a regular (two- to three-yearly) household survey on tobacco, alcohol and drug use. This survey collects detailed data on the patterns of smoking, alcohol and illicit drug use in Australia, providing basic time series information to help monitor government policies and programs on drugs. It also contains questions on community awareness of drugs, and views on government drug and alcohol policies. The next survey is scheduled for 2004.

Most state and territory governments conduct health surveys using CATI to collect timely data on risk factors, disease patterns and use of health services. The National CATI Health Survey Technical Reference Group has been established under the National Public Health Partnership to encourage harmonisation of survey questions and methods for topics such as behavioural risk factors and chronic diseases. The Reference Group has published background papers on the development of survey questions relating to alcohol consumption, asthma, cardiovascular diseases, diabetes, food behaviour, physical activities and tobacco consumption as well as selected demographic characteristics (CATI TRG 2003a). National data will become available when all CATI surveys use a standard set of questions and Tasmania and the two territories are able to conduct these surveys themselves or commission other states to do the collection on their behalf.

A national survey of general practice activities has been conducted since 1998 by the AIHW's General Practice Statistics and Classification Unit at the University of Sydney. Called BEACH—Bettering the Evaluation and Care of Health—it is a continuous survey of about 1,000 general practitioners (GPs) each year. It is supported by funds from the Australian Government Department of Health and Ageing and from a number of pharmaceutical companies.

The GPs are recruited on a 'rolling' basis, each participant providing details about 100 consecutive GP-patient encounters. This produces an annual database pertaining to about 100,000 encounters, and in total the database now includes about 600,000 records.

Data collected in the survey include patient characteristics, patient reasons for encounter, problems managed and treatments including details of prescriptions. In sub-samples of encounters other topics are investigated, including patient risk factors such as body mass index, smoking behaviour and alcohol intake, and special interest topics.

A national physical activity survey was conducted in 1997, 1999 and 2000 with the support of the Australian Government Department of Health and Ageing and the Australian Sports Commission. The survey is a telephone interview survey that collects detailed data on physical activities for the week before the interview. These include walking for recreation, exercise or work, gardening, and all types of physical exercise (AIHW 2003c). The activity questions used in this survey are being used in several state telephone interview surveys.

Oral health surveys are conducted regularly by the AIHW's Dental Statistics and Research Unit at the University of Adelaide.

The Child Dental Health Survey has been conducted annually since 1977 on the state of oral health among Australia's school-aged children who receive care at state/territory school dental services. Information collected includes experience of dental decay (decayed, missing and filled teeth), provision of preventive fissure sealants, frequency of dental examinations in school dental services and demographic characteristics.

The Adult Dental Programs Survey, conducted in 1995–96 and 2000–01, collects information on the state of oral health of Australia's adults who are eligible for public-funded dental care provided through state and territory public emergency and general dental services. Information collected includes experience of dental decay (decayed, missing and filled teeth) and periodontal (gum) disease. A proposal is being made for an update of this survey in 2005–06.

The National Dental Telephone Interview Survey monitors changes in basic features of oral health, dental care and access to dental services in the Australian population. This survey has been conducted in 1994, 1995, 1996, 1999 and 2002. The next survey will begin in July 2004. Information collected includes self-reported oral health status, edentulism, self-reported number of remaining teeth, oral self-care, fluoride exposures, availability and use of dental services, dental insurance and eligibility for public-funded dental care.

The National Survey of Adult Oral Health collects information on the experience of dental decay (decayed, missing and filled tooth surfaces), periodontal (gum) destruction (periodontal recession and pocket depth), dental plaque and oral mucosal lesions. This survey includes dental examination by oral clinicians and telephone interviews that ask sampled adults about their preventive dental practices, access to dental care and socio-demographic background. Patterns in population oral health are analysed, including regional and socioeconomic differences and caries experience in adults with varying exposure to water fluoridation. The survey also examines the association of cardiovascular disease with periodontal disease. The first survey of this type was conducted in 1987–88 and the next is scheduled for 2004–05. Data from the 2004–05 survey will allow changes since 1987–88 to be evaluated.

Gaps in surveys

Despite these efforts in survey development, there are three notable gaps in health survey information in Australia.

One is the lack of up-to-date information on diet and nutrition. The ABS and the then Commonwealth Department of Health and Family Services conducted the last survey of diet and nutrition in 1995, and there is no current plan to conduct another one. Given the clear link between nutrition and a range of diseases and the current policy imperatives in promoting healthy weight and to reduce the level of obesity in the population, this deficiency in food and nutrition intake data is a serious gap in the health statistics system in Australia. Indirect estimates using agricultural production data are affected by the quality of the basic data and the assumptions made for the estimation (AIHW: Field et al. 2003). These indirect estimates are only substitutes for survey data of actual eating habits and food intake. The ABS has indicated that it does not intend to continue its food consumption report based on production statistics.

The second serious gap is the lack of national information on biomedical health risk factors. Biomedical measures of population health include blood sugar and cholesterol levels and these have been included by the WHO in step 3 of a 3-STEP risk factor surveillance system that would provide important core indicators of the population health of a country (Bonita et al. 2001). There has not been an official Australian national survey that includes biomedical measurements, although a one-off survey was conducted by the International Diabetes Institute in 2000 (Dunstan et al. 2002) which provided base line data on the prevalence of diabetes, obesity and other cardiovascular disease behavioural and biomedical risk factors. In an effort to develop an ongoing monitoring system, a pilot study for a national biomedical risk factor survey was conducted in 2003 (see Box 7.1). Other comparable countries (United States of America, England and New Zealand) have well-established programs and a large survey is being implemented in Canada.

The third gap is the lack of an up-to-date survey on mental health status. The last ABS mental health survey was conducted in 1997, and there is no plan to conduct another one, although the three-yearly National Health Survey contains some information on mental health status and wellbeing.

7.6 A network of electronic health information

In 2001, Australian, state and territory governments commenced a two-year research and development project, known as Health*Connect*, to assess the feasibility of a national electronic health record network. The concept of a national health information network was proposed by the National Electronic Health Record Taskforce in its 2000 report to AHMC. The project is undertaken by the Health*Connect* Program Office, located in the Australian Government Department of Health and Ageing.

Under this concept, summary health-related information about an individual would be collected in a standardised electronic form at the point of care. With the consumer's consent, this summary information can then be accessed by authorised health service providers when and where it is needed for clinical care.

By combining disparate sources of health information into a comprehensive health record, both providers and consumers will have more rapid access to personal health information needed for clinical decision making. Efficiency gains are anticipated both through reductions in the time currently spent in gathering information held in other organisations across the health sector, as well as a reduction in pathology and diagnostic tests repeated unnecessarily in the absence of ready access to previous results.

Another potential benefit is the possibility of producing timely and quality statistical information. However, this would depend on the purpose of the statistical data generated from such a network. Data for program or service monitoring and health surveillance need to be representative, at any geographic level or for any particular population grouping. The proposed 'opt-in' basis of the information network could limit its statistical potential unless a very high participation rate can be achieved. Another potentially limiting factor could arise from the range of information included in the summary electronic record: the range of information required for statistical applications may be different from that included in the clinical summary record. In

addition, for the data contained in the summary record to be useful statistically, they need to be collected according to national standards and of sufficient detail for standard health classification.

In the past two years, Health*Connect* work has progressed. In 2000–01, a business architecture document was developed for wide consultation, and Version 1.0 of this architecture was released in 2002. Based on business requirements contained in this document, a systems architecture was drafted and issued in 2003 for consultation. Proof-of-concept trials were fast-tracked in Tasmania and the Northern Territory, with longer-term trials in several sites in New South Wales and Queensland to test various aspects of the network.

The Health*Connect* Program Office has released an Interim Research Report covering its findings from the first phase of the project (Health*Connect* Program Office 2003). Health Ministers agreed in November 2002 to fund a further two years of research and development work including further trials, examination of cost issues and finalisation of the Health*Connect* design. More recently, as part of its Medicare-Plus Package, the Australian Government committed funds for Health*Connect* for the next three years, commencing with state-wide rollouts of the Health*Connect* integrated medical records system in Tasmania and South Australia.

7.7 Future directions

The new health information governance arrangements have important implications for the future development of health information and statistics. By bringing together statistical and information technology aspects of information, the new governance arrangements will enable a more integrated approach to information development and management. The relationships between clinical information required by health providers, health information required by patients and statistical information required by policy developers and program managers will be better understood and managed. Efficiency will be gained if data collected at the clinical level can be used many times by clinicians, clients and government agencies for their different purposes. Work is required to document clearly information requirements and to ensure data standards are endorsed and applied consistently in different settings to enable data comparability and consistency. The ability of information systems developed for clinical purposes, such as those under Health*Connect*, to provide higher level statistics will be critical in achieving any efficiency gain.

Considerable work is being done on improving the quality of data on Indigenous health. Progress, however, has been slow. Until good-quality Indigenous administrative data are available for a period of time, there will be difficulties in monitoring the health status of the Indigenous population and in drawing conclusions on whether Indigenous health is improving. Because a substantial proportion of the rural and remote population is Indigenous, improvements in Indigenous health data will also enable a better understanding of the health status of the non-Indigenous population in these areas.

Efforts to harmonise state and territory health CATI surveys can be expected to result in usable and up-to-date national health surveillance data, including broad measures of health status and behavioural risk factors. The National Public Health Information Working Group can play an important role in accelerating this development.

With the development of national minimum data sets in the various health sectors, there are opportunities to undertake more detailed analyses on issues that cut across different health sectors. For example, new national data from hospital emergency departments can be used jointly with data from the AIHW general practice survey and hospital inpatient data to understand the relationship between and the level of use of each of the three services. Similarly, AIHW general practice survey data can supplement Health Insurance Commission data on medical services and prescriptions and provide estimates of the health problems treated and funded by the Medicare and Pharmaceutical Benefit Schemes.

The lack of up-to-date information on food intake, nutrition and biomedical measurements is a serious gap. Measures of the levels, patterns and trends in a range of disease risk factors are therefore not available to help develop and monitor government and non-government initiatives to promote healthy behaviour.

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8 Health of older Australians

Older Australians are an important and rapidly growing group, and there is a need to assess and monitor their health. This chapter gives an overview of the health status of Australians aged 65 years and over, and examines demographic trends, mortality, disability, risk factors, expenditure on the main health conditions and use of selected health services. Dementia, vision conditions and oral health are profiled in more detail.

People aged 65 and over comprise a very wide age span and a potential diversity of features. All too often, however, there is a risk of overlooking any diversity by analysing all data on older people as if they were a single group. This often results from a concern that subdividing will produce small numbers and make statistical estimates too uncertain. This chapter aims to overcome the problem of numbers by focussing only on major health conditions among broad age-groups, namely 65 to 74 years, 75 to 84, and 85 and over. Nevertheless, estimates for those aged over 84 years should be interpreted with caution because the numbers can still be small.

Broader health-related indicators in the areas of socioeconomic status, and government and non-government expenditure have been excluded from the scope of this chapter. Community services for older Australians are examined in detail in each biennial edition of *Australia's Welfare,* in *Older Australia at a Glance* and in other AIHW reports on ageing and aged care.

8.1 Introduction

The key demographic indicators in this chapter present a generally positive picture of an older Australia—many more Australians living to 75, 85 and 100 years old, increasing life expectancy at ages 65, 75 and 85 years, and falling death rates. In the 2001 National Health Survey by the Australian Bureau of Statistics (ABS), older Australians reported overwhelmingly that they had good, very good or excellent health. Hence many are continuing to actively contribute to the community through voluntary and paid employment, extended family support, and participation in community social, sporting and cultural activities. However, the process of ageing is often associated with the onset of disabilities which may restrict participation in a range of life areas.

These longevity and health gains for older Australians in the wider Australian community have not been shared by Aboriginal and Torres Strait Islander peoples, whose life expectancy remains 20 years shorter than for other Australians (ABS & AIHW 2003).

The onset of ill health is largely inevitable for many of those in old age. A major focus of this chapter is to measure not only the extent of this in each of the three age groups but, for the main health conditions, to document the level of disability associated with those conditions. People with severe or profound levels of disability are likely to be those in greatest need of support services. Also, delaying the onset of ill health and reducing levels of severe disability may be achievable through prevention strategies, screening and management of health risk factors, as well as through improvements in health service diagnosis, treatment and rehabilitation of illness and injury. Trends in a number of key risk factors are examined.

8.2 Demography

Australia's older population, aged 65 years and over, represented 12.7% of the total population in 2002. This was similar to the United States and Canada, but well below the 18.4% of Japan, the 17.3% of Sweden and the 15.9% of the United Kingdom.

Australians are increasingly living to old age. The ABS estimated that there were 3,800 Australian residents aged 100 years or more, and over 18,800 aged 95–99 years, at 30 June 2003. Just over 2.5 million were aged 65 years or more.

Table 8.1: Life expectancy and percentage of population, selected OECD countries, 2000–02

			Life expectancy (years)			
	Population		Age 65		Age 80	
Country	% age 65+	% age 80+	Males	Females	Males	Females
Australia	12.7	3.2	17.2	20.7	7.8	9.5
Canada	12.7	3.2	16.9	20.5	7.8	9.7
Denmark	14.8	4.0	15.2	18.3	6.8	8.8
Finland	15.1	3.5	15.5	19.3	6.6	8.1
Japan	18.4	4.0	17.5	22.4	8.1	10.6
Netherlands	13.6	3.3	15.3	19.2	6.4	8.3
New Zealand	11.9	2.9	16.4	19.8	7.4	9.2
Poland	12.0	2.1	13.6	17.3	6.5	7.4
Sweden	17.3	5.1	16.7	20.0	7.1	8.8
Switzerland	15.4	4.1	16.9	20.7	7.4	9.1
United Kingdom	15.9	4.2	15.6	18.9	6.9	8.6
United States	12.5	3.4	16.3	19.2	7.6	9.1

Note: Data availability by year varied between countries, but data were generally available for 2001 or 2002 for population and 2000 or 2001 for life expectancy.

Source: OECD Health Data 2003.

Table 8.2: Estimated resident population, Australia, 30 June 2003

Age group	Estimated resident population	% of population
65–69	720,072	3.62
70–74	629,877	3.17
75–79	537,980	2.71
80–84	368,189	1.85
85–89	190,953	0.96
90–94	75,981	0.38
95–99	18,823	0.09
100 & over	3,766	0.02
Total 65 & over	2,545,641	12.80
All ages	**19,881,469**	**100.00**

Source: ABS Cat. No. 3101.0 June Quarter 2003.

Trends

Between 1991 and 2001, the male population aged 65 years and over increased by 29%, from 836,300 to almost 1.1 million, and the female population by 22%, from 1.1 million to almost 1.4 million. However, the percentage increases for the 65–74 years populations (17% for males, 8% for females) were small in comparison to the growth of the 85 years and over populations (85% increase for males, 67% increase for females).

Table 8.3: Demographic trends, population aged 65 years and over

	Age group			
	65–74	**75–84**	**85+**	**Total 65+**
Population ('000)				
1991				
Males	548.6	243.4	44.2	836.3
Females	633.5	370.9	110.0	1,114.5
2001				
Males	639.1	355.6	81.9	1,076.7
Females	681.7	493.8	183.3	1,358.9
Increase 1991 to 2001 (%)				
Males	*16.5*	*46.1*	*85.3*	*28.7*
Females	*7.6*	*33.1*	*66.6*	*21.9*
2021 (ABS Series 8 projection)				
Males	1,213.2	661.2	246.9	2,121.3
Females	1,281.9	748.2	390.2	2,420.3
Increase 2001 to 2021 (%)				
Males	*89.8*	*85.9*	*201.5*	*97.0*
Females	*88.0*	*51.5*	*112.9*	*78.1*
Life expectancy (years)	**At age 65**	**At age 75**	**At age 85**	
1991				
Males	15.4	9.3	5.2	
Females	19.3	11.9	6.4	
2001				
Males	17.2	10.4	5.6	
Females	20.7	12.9	6.8	
Increase 1991 to 2001 (%)				
Males	*11.7*	*11.8*	*7.7*	
Females	*7.3*	*8.4*	*6.2*	

Note: The ABS Series 8 population projection includes fertility declining until 2011 then stabilising at 1.6, recent trends in declining mortality to continue, and continuing relatively high overseas immigration.

Source: ABS Catalogue Numbers 3101.0, 3222.0, 3302.0.

Contributing to this were the relative size of the birth cohorts that reached aged 65 during the period and the improvements in life expectancy of those aged 65 and above between 1991 and 2001. The birth cohorts that reached aged 65 between 1991 and 2001 were born between 1926 and 1936. While the size of these birth cohorts was affected by the relatively low fertility rate during the recession in the early 1930s, they were supplemented by immigration after the Second World War. The cohorts

that reached age 65 during 1991 and 2001 were considerably larger than the cohorts before them. The cohort that was born after the Second World War during the baby boom years will begin to reach age 65 from around 2010, and this is expected to accelerate the ageing of the population from then. Life expectancy between 1991 and 2001 increased significantly for those aged 65 and above—by 1 to 2 years at age 65 and at age 75 and by 0.4 years at age 85 for both males and females. In 2001 the remaining life expectancies for males and females were 17.2 years and 20.7 years respectively; and at age 85 years the remaining expectancies were 5.6 years for males and 6.8 years for females.

The ABS's projections of the Australian population to 2021 indicate a continuation of rapid growth in the population aged 65 years and over, which is projected to double over the 20-year period.

8.3 Mortality

One of the strongest indicators of the improving health of older Australians is falling death rates for people aged 65–74 years, 75–84 years and 85 years and over. During the decade 1993–2002 there were sharp falls in the age-specific death rates for these age groups. The percentage fall was greatest in the 65–74 year age group, by 25% for males, from 2,989 to 2,231 per 100,000 males, and by 21% for females, from 1,615 per 100,000 females to 1,282. There was almost as great a reduction for the 75–84 year age group. Among males aged 85 years or more the percentage reduction in the death rate was smaller at 8%, from 17,869 to 16,441 per 100,000 males, similar to the 7% decline for females, from 14,133 to 13,390 per 100,000 females.

Most of the overall reduction in age-specific death rates from 1993 to 2002 was due to large falls in the death rates for cardiovascular diseases, attributed mainly to changes in lifestyle risk factors and improvements in medical care. For males, the age-specific death rates for cardiovascular diseases have fallen by 44% for 65–74 year olds, 37% for 75–84 year olds and 17% for those aged 85 years or more. The reductions in the rates for females were very similar.

Age-specific death rates for cancer also declined from 1993–2002; however, the rate of decline was much greater for males than for females because of a major decline in the prevalence of tobacco smoking among males since the 1960s. For males, the age-specific death rates for cancers have fallen by 12%, 6%, and 9% for the age ranges of 65–74, 75–84 and 85 and over respectively. For females the falls were 7% for 65–74 year olds and 2% for women aged 85 years and over, contrasting with a 2% increase for women aged 75–84 years.

The death rates for respiratory diseases were much higher for males than for females in each of the older age groups. However, among 75–84 year olds and those aged 85 years or more, there was a sharp rise in the death rates for females between 1993 and 2002, by 19% and 31% respectively. Some of these increases are attributed to definitional changes occurring between revisions 9 and 10 of the *International Classification for Diseases and Related Health Problems*, and to the introduction of an automated coding system by the ABS for coding causes of death (ABS 2003a).

These definitional and coding system changes also contributed to the increase in death rates from nervous system diseases for 65–75 year olds and people aged 85 and over between 1993 and 2002. Musculoskeletal death rates, from falls in particular, were higher among women than men, and the rates were much higher for those aged 85 years and over.

Table 8.4: Age-specific deaths per 100,000 males and females for persons aged 65 years and over, all causes and selected conditions, 1993, 1998 and 2002

	Males				Females			
	1993	1998	2002	% inc. 1993–2002	1993	1998	2002	% inc. 1993–2002
All causes								
65–74 years	2,989	2,608	2,231	–25	1,615	1,416	1,282	–21
75–84 years	7,646	6,734	6,060	–21	4,769	4,261	3,946	–17
85 years & over	17,869	16,742	16,441	–8	14,133	13,547	13,390	–7
Cardiovascular diseases								
65–74 years	1,278	961	721	–44	629	483	357	–43
75–84 years	3,689	3,006	2,332	–37	2,604	2,074	1,670	–36
85 years & over	9,275	8,387	7,716	–17	8,867	7,943	7,283	–18
Cancers								
65–74 years	1,100	1,038	936	–12	588	560	561	–7
75–84 years	1,994	1,904	1,887	–6	978	987	1,003	2
85 years & over	3,050	2,969	2,941	–9	1,555	1,506	1,479	–2
Respiratory diseases								
65–74 years	272	227	199	–27	140	117	120	–14
75–84 years	796	665	659	–17	315	334	375	19
85 years & over	2,050	1,778	2,050	0	906	972	1,185	31
Nervous system diseases								
65–74 years	48	47	56	17	31	37	43	39
75–84 years	193	199	151	–22	122	146	117	–4
85 years & over	495	566	548	11	363	499	558	54
Musculoskeletal conditions								
65–74 years	11	11	11	0	15	15	13	–10
75–84 years	30	26	34	13	38	33	45	18
85 years & over	85	57	104	22	125	116	141	13

Source: AIHW National Mortality Database.

Trends in the leading cause of death

In 1993, cardiovascular disease was the leading cause of death for persons aged 65–74 years, accounting for 43% of male deaths and 39% of female deaths. By 2002 this percentage had fallen to 32% for males and 28% for females. Conversely, deaths from cancer in this age group accounted for 36% of deaths for males and 37% of deaths for females in 1993 and increased to 42% for males and 44% for females in 2002, thus making deaths from cancer the leading cause of death.

For persons in the 75–84 age range, deaths from cardiovascular diseases accounted for 48% and 55% of all deaths for males and females respectively in 1993, but declined to 39% for males and 42% for males in 2002, nevertheless remaining the leading cause of death.

Similarly, cardiovascular diseases remained the leading cause of deaths in 2002 for males and females aged 85 and over. There was very little change in the cancer death rate over the decade but the proportion of deaths from cardiovascular diseases fell by 5 percentage points for males and by 8 percentage points for females.

Table 8.5: Cardiovascular disease and cancer deaths as a percentage of all deaths, 1993, 1998 and 2002

	Males			Females		
	1993	1998	2002	1993	1998	2002
Circulatory diseases						
65–74 years	42.8	36.9	32.3	38.9	34.1	27.8
75–84 years	48.2	44.6	38.5	54.6	48.7	42.3
85 years & over	51.9	50.1	46.9	62.7	58.6	54.4
Cancers						
65–74 years	35.6	39.8	41.9	37.1	39.6	43.8
75–84 years	26.1	28.3	31.1	21.4	23.2	25.4
85 years & over	18.2	17.7	19.9	10.6	11.1	11.0

Source: AIHW National Mortality Database.

8.4 Wellbeing

As noted in Chapter 1, the World Health Organization has described health as 'a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity'. In this section indicators of wellbeing show that most Australians aged 65 and over are still living in their own homes or with relatives and leading healthy lives in which they are actively participating in the community.

Self assessed health status

In the 2001 National Health Survey, older Australians living in private households reported overwhelmingly that they had good to excellent health. Even among those 85 years and over, 72% of males and 60% of females reported having good, very good or excellent health.

Table 8.6: Self assessed health status, persons aged 65 years and over in private households, 2001

Self assessed health status	Males			Females		
	65–74	75–84	85+	65–74	75–84	85+
Excellent	11.0	8.5	6.5	13.4	7.6	6.5
Very good	21.4	18.6	16.0	22.6	21.7	24.7
Good	36.3	33.4	49.7	35.6	31.6	28.5
Fair	19.7	29.0	23.3	20.7	26.9	22.7
Poor	11.7	10.4	4.4	7.7	12.2	17.6
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: ABS National Health Survey, 2001.

Living arrangements

At the 2001 Census of Population and Housing, the great majority of people aged 65 and over were living at home with a partner or other relatives, or were living alone. Even for people aged 95 and over, 68% of males and 41% of females were living in private dwellings. The use of cared accommodation in non-private dwellings rose sharply for people aged 85 and over—18% of males aged 85–94 and 28% of those aged 95 and over, and 30% of females 85–94 and 56% of those aged 95 and over, were residing in cared accommodation at the census. This includes persons living in hospitals, nursing homes and other residential aged care accommodation, hostels for the disabled, childcare institutions, and other welfare institutions.

Because females tend to, on average, survive for several years longer than their spouses, 44% of males aged 85–94 were still living in their own homes with a partner. This contrasted with females in this age group—only 9% were still living at home with a partner, 41% were living alone and 16% were living with relatives other than a partner.

Table 8.7: Living arrangements, people aged 65 and over, 2001 (per cent)

	In private dwellings				In non-private dwellings		
Age group	With partner[(a)]	With other relatives	Lone person	Total in private dwellings[(b)]	Resident of cared accomodation[(c)]	Total in non-private dwellings[(d)]	Total
				Males			
65–74	74.8	3.8	14.8	98.1	1.3	1.9	100.0
75–84	66.5	4.9	19.5	94.7	4.6	5.3	100.0
85–94	43.9	8.6	25.5	81.0	17.6	19.0	100.0
95 and over	27.4	13.7	21.2	68.0	27.8	32.0	100.0
Total 65 and over	*69.5*	*4.6*	*17.2*	*95.6*	*3.7*	*4.4*	*100.0*
				Females			
65–74	56.0	10.6	27.5	98.4	1.3	1.6	100.0
75–84	31.8	13.4	43.3	91.8	7.5	8.2	100.0
85–94	9.2	15.9	40.8	68.1	30.2	31.9	100.0
95 and over	6.0	15.4	18.0	41.3	56.1	58.7	100.0
Total 65 and over	*40.7*	*12.3*	*34.9*	*91.5*	*7.8*	*8.5*	*100.0*

(a) With or without other family members or non-related persons present.

(b) Includes persons in other private household arrangements, and persons living in 'not classifiable' households.

(c) Includes persons living in hospitals, residential aged care accommodation, hostels for the disabled, childcare institutions and other welfare institutions.

(d) Includes persons living in other types of non-private dwellings such as hotels/motels, boarding houses, refuges, hostels for the homeless, convents/monasteries, etc. Includes owners, proprietors, staff and family living in non-private dwellings.

Source: 2001 Census of Population and Housing, ABS Cat. No. 2048.0.

Participation in paid and voluntary work

In 2001, there were 181,000 people aged 65 and over who were in the labour force, that is either employed or unemployed. This represented 7.8% of this age group, a decline since 1971 when 11.8% of people aged 65 and over were either in paid employment or

unemployed (ABS 2003b). Much of this decline can be explained by the increased proportion of people aged 75 and over in the 65 and over age group. Labour force participation by people aged 75 and over in 2001 was much lower than by people aged 65–69 (20.5% of males and 9.6% of females) and by people aged 70–74 (10.4% of males and 4.4% of females).

In 2001, 20% of employed persons aged 65 and over were working in the agriculture, forestry and fishing industry, 12% in property and business services, 9.3% in retail trade, 8.7% in manufacturing, 8.1% in health and community services, 4.7% in wholesale trade and 4.6% in education.

Table 8.8: Labour force status, people aged 65 and over, 2001 (per cent)

	In labour force					
Age group	Employed full-time	Employed part-time	Total employed[(a)]	Unemployed	Not in labour force	Total
			Males			
65–69	10.5	8.6	20.0	0.5	79.5	100.0
70–74	4.3	5.1	10.2	0.2	89.6	100.0
75–79	2.3	2.9	5.9	0.2	93.9	100.0
80–84	1.8	1.9	4.3	0.2	95.5	100.0
85 and over	2.6	1.6	4.9	0.4	94.7	100.0
			Females			
65–69	3.0	5.8	9.4	0.2	90.4	100.0
70–74	1.2	2.5	4.3	0.1	95.6	100.0
75–79	0.6	1.2	2.3	0.1	97.6	100.0
80–84	0.5	0.8	1.8	0.1	98.1	100.0
85 and over	0.5	0.7	1.6	0.2	98.2	100.0

(a) Includes persons who did not state their hours worked.

Source: 2001 Census of Population and Housing, ABS Cat. No. 2048.0.

In the ABS survey of voluntary work in 2000, a volunteer was someone who, in the last 12 months, willingly gave unpaid help, in the form of time, service or skills, through an organisation or group. Around 30% of males and females aged 65–74 and 18% of those aged 75 years and over were volunteers in 2000, a total of 528,000 people aged 65 and over. Volunteer activity can also include providing informal assistance to family members, to friends and neighbours but this was not included in the survey.

Table 8.9: Volunteers aged 65 years and over, 2000

	Age group					
	65–74	75+	65–74	75+	65–74	75+
	Males		Females		Persons	
Number of volunteers	184,700	66,600	196,700	80,000	381,400	146,600
% of population	31.1	18.8	29.5	17.1	30.3	17.8

Source: 2000 survey of voluntary work, ABS Cat. No. 4441.0.

Both males and females aged 65 and over were most likely to volunteer to assist community or welfare and religious organisations. However, males were next most likely to assist a sport or recreation organisation (23% of male volunteers), in contrast to females who chose health organisations (16% of female volunteers).

The main reasons why people aged 65 years and over volunteered was to help others or the community (54% of volunteers), personal satisfaction (51%), to do something worthwhile (35%), social contact (28%), and to be active (19%). All of these reasons may have positive benefits for personal wellbeing.

Table 8.10: Volunteers aged 65 years and over: types of organisations and reasons for volunteering, 2000

	% of volunteers
Organisation	
	Males
Community/welfare	53.3
Religious	23.9
Sport/recreation	22.8
Education/training/youth development	10.2
Health	6.7
Total [(a)]	*100.0*
	Females
Community/welfare	74.2
Religious	25.6
Health	15.8
Sport/recreation	8.5
Education/training/youth development	3.6
Total [(a)]	*100.0*
Reasons for being a volunteer	**Persons**
Help others/community	54.2
Personal satisfaction	50.9
To do something worthwile	35.1
Social contact	27.5
To be active	19.1
Religious beliefs	17.2
Personal/family involvement	13.7
Use skills/experience	9.8
To learn new skills	2.5
Other	8.8
Total [(b)]	*100.0*

(a) Includes all other organisations. Individuals may work for more than one type of organisation; hence figures do not add to 100%.

(b) More than one reason may be given; hence figures do not add to 100%.

Source: 2000 survey of voluntary work, ABS Cat. No. 4441.0.

In addition to volunteer work through organisations or groups, considerable caring responsibilities are carried out by older Australians. For example, the 2002 ABS Child Care Survey found that over one million children used informal care either alone or in combination with formal care, of which about half was provided by grandparents (AIHW 2003, ABS 2003c). An analysis of the 1998 ABS Survey of Disability, Ageing and Carers found that around 8,000 co-resident principal carers of people with a severe and profound disability were parents aged 65 years and over (AIHW 2003). In addition, around 97,000 persons aged 65 and over (22% of all carers) were caring as an informal primary carer for another person, mainly spouses, partners or parents (AIHW 2003). Details of informal care provided by Australians including older Australians are presented in chapter 3 of *Australia's Welfare 2003* (AIHW 2003).

Attendance at cultural venues and events

The 2002 ABS General Social Survey found that most people aged 65 and over attended a cultural venue or event within the previous 12 months, with the most popular being cinemas, botanic gardens, libraries, zoological parks and aquariums, and various types of live theatrical or musical entertainment.

A 2001 ABS survey on environmental issues also found that 31% of people aged 65 and over had visited a World Heritage Area, National or State Park in the 12 months before March 2001 (ABS 2001).

Table 8.11: People aged 65 and over attending cultural venues and events in the 12 months before interview in 2002 (per cent)

	Age group			
	65–74	75+	65–74	75+
Venue or event attended	Males		Females	
Art galleries	19.3	12.0	25.2	19.2
Museums	19.0	17.2	21.7	14.1
Zoological parks & aquariums	24.1	14.5	25.5	12.9
Botanic gardens	40.3	21.1	39.4	26.3
Libraries	36.8	31.9	37.8	34.9
Classical music concerts	9.2	5.2	12.8	9.8
Popular music concerts	12.1	7.4	11.8	9.0
Theatre performances	11.4	6.0	18.3	13.5
Dance performances	6.4	2.0	11.3	5.6
Musicals and operas	14.2	9.2	24.0	15.6
Other performing arts	14.3	9.6	14.7	11.5
Cinemas	41.5	25.3	46.8	35.2
At least one venue or event	73.1	59.8	78.9	65.5

Source: 2002 General Social Survey, ABS Cat. No. 4114.0.

Participation in sport and physical activity

People aged 65 and over have only a limited active participation in sport and physical activities. In the 12 months before 2002, 51% of males aged 65 and over and 41% of females participated in such physical activities. The most popular was walking for exercise, undertaken by 25%, followed by lawn bowls (6.2%), golf (6.0%) and aerobics and other fitness activities in gymnasia and exercise rooms (5.0%).

Table 8.12: People aged 65 and over participating in sport and physical activities in the 12 months prior to interview in 2002 (per cent)

Type of activity[(a)]	Males	Females	Persons
Organised only	11.6	11.8	11.7
Non-organised only	27.9	21.8	24.6
Both organised and non-organised	11.1	7.7	9.2
Total participation	**50.6**	**41.3**	**45.6**
Most popular activities			
Walking for exercise			25.2
Lawn bowls			6.2
Golf			6.0
Aerobics/fitness[(b)]			5.0
Swimming			3.9
Carpet bowls			2.8
Fishing			2.6
Tennis			1.6
Cycling			1.5
Dancing			1.4

(a) Selected activities.

(b) Includes callisthenics, gym, exercise bike and circuits.

Source: 2002 General Social Survey, ABS Cat. No. 4177.0.

Use of computers and the Internet

Computers, email and the Internet have become increasingly important and popular communication tools for people of all ages, including older Australians. These tools can assist in improving quality of life and social wellbeing (ABS 2003b). In 2001, 17% of males and 11% of females aged 65–74, and 8.3% of males and 3.0% of females aged 75 and over, were using a computer at home. At the same time, 12% of males and 6.2% of females aged 65–74, and 5.1% of males and 1.6% of females aged 75 and over, were accessing the Internet, either from home or another location.

Table 8.13: Home computer and Internet use by people aged 65 years and over, 2001

	Age group					
	65–74	75+	65–74	75+	65–74	75+
	Males		Females		Persons	
Using a computer at home	17.4	8.3	10.5	3.0	13.8	5.0
Using the Internet	12.3	5.1	6.2	1.6	9.1	3.0

Source: 2001 Census of Population and Housing, ABS Cat. No. 2056.0.

8.5 Disability

The onset of long-term medical conditions in older age may result in various levels of disability, from nil to profound. The source of data is the 1998 ABS Survey of Disability, Ageing and Carers. Definitions of disability and other aspects of the survey are discussed in Chapter 2. A major difference between this survey and the 2001 National Health Survey was that the Disability Survey included non-private dwellings such as hospitals, residential aged care and caravan parks within its sample, as well as the private dwellings surveyed in the National Health Survey. This is especially important for measuring conditions such as dementia, because the numbers of people living in private households who report that they have this disease are low.

Table 8.14: Proportion of the population aged 65 or over: disability status and level of disability by health conditions, 1998

		Level of disability				
Health conditions	Estimated number	Profound or severe	Moderate or mild	No core activity restriction	No disability	Total
	('000)			Per cent		
All health conditions[(a)]						
Dementia, incl. Alzheimer's	97.8	95.6	*2.8	**0.2	1.5	100.0
Other mental & behavioural	293.6	59.0	21.3	4.3	15.4	100.0
Stroke	192.7	55.8	24.6	*3.2	16.4	100.0
Other cardiovascular disease	390.8	35.6	35.8	4.9	23.6	100.0
Respiratory	244.3	30.0	39.8	7.9	22.3	100.0
Cancer	67.4	35.6	33.5	*6.4	24.5	100.0
Diabetes	200.2	32.5	29.5	4.3	33.7	100.0
Vision	227.3	57.2	34.6	5.1	*3.1	100.0
Hearing	663.9	30.9	46.6	7.1	15.4	100.0
Arthritis	801.0	28.4	38.8	6.2	26.6	100.0
Other musculoskeletal	499.7	32.2	43.4	6.8	17.5	100.0
Main health condition[(b)]						
Dementia, incl. Alzheimer's	64.1	98.1	**0.3	**0.1	**1.4	100.0
Other mental & behavioural	54.4	35.2	19.5	*5.6	39.7	100.0
Stroke	49.5	78.1	*14.2	**1.6	*6.0	100.0
Other cardiovascular disease	132.4	21.5	32.0	7.6	38.9	100.0
Respiratory	115.5	21.9	36.7	8.5	32.9	100.0
Cancer	24.8	*19.1	*30.0	**9.9	41.1	100.0
Diabetes	65.0	14.5	23.7	*4.5	57.3	100.0
Vision	76.9	42.8	42.0	*9.4	*5.7	100.0
Hearing	164.6	8.3	54.6	10.3	26.7	100.0
Arthritis	412.3	23.0	36.4	5.7	34.9	100.0
Other musculoskeletal	263.8	24.3	43.9	7.5	24.4	100.0

(a) All persons reporting the condition in the survey.

(b) Only persons reporting the condition in the survey as the main condition.

Note: Estimates marked with ** have an associated relative standard error (RSE) of 50% or more. Estimates marked with * have an associated RSE of between 25% and 50%. These estimates should be interpreted accordingly.

Source: AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

Table 8.14 lists the main diseases among people aged 65 years or more in 1998, the numbers of people with those diseases and the level of disability associated with the disease. The disease which caused the highest levels of severe or profound disability was dementia (96% of persons with dementia suffer from a severe or profound disability). The next most disabling health condition was other mental and behavioural disorders (59% of people with these having a severe or profound disability), followed by eyesight diseases (57%) and stroke (56%).

Table 8.15 gives a summary of the main health conditions for those who have a disability. Among males aged 65 years or more, the main conditions associated with a disability were hearing loss (30% of males aged 65 or more in the population in 1998), arthritis (22%), stroke and other cardiovascular diseases (21%) and other musculoskeletal problems (17%). Among females aged 65 years or more, the main conditions associated with a disability were arthritis (29%), hearing loss (21%), stroke and other cardiovascular diseases (19%) and other musculoskeletal problems (19%). There is a sharp rise for most health conditions in the prevalence of associated disability in the 85 years and over age group.

Table 8.15: Proportion of the population with a disability, all levels of disability, by health condition, 1998 (per cent)

	Males				Females			
Selected health condition[(a)(b)]	**65–74**	**75–84**	**85+**	**Total 65+**	**65–74**	**75–84**	**85+**	**Total 65+**
Dementia incl. Alzheimer's	*1.4	4.1	16.4	3.3	*0.8	4.8	23.9	5.0
Other mental & behavioural	5.4	9.9	20.7	7.9	8.4	13.7	33.8	13.4
Stroke	4.7	10.5	17.4	7.4	3.4	9.7	14.2	6.9
Other cardiovascular disease	11.3	16.1	28.0	14.0	7.0	14.4	31.1	12.5
Respiratory	9.3	10.4	*11.2	9.8	7.2	7.3	7.4	7.3
Cancer	2.3	4.1	6.2	3.1	1.5	1.4	2.1	1.5
Diabetes	4.9	8.6	*8.9	6.3	4.3	6.4	8.0	5.5
Vision	4.4	11.7	26.3	8.2	5.1	13.6	27.7	10.9
Hearing	23.0	36.9	56.2	29.6	12.5	24.9	46.7	21.0
Arthritis	18.5	25.0	35.1	21.7	24.5	31.5	43.2	29.2
Other musculoskeletal	15.5	18.2	26.7	17.1	16.0	21.6	24.4	19.0

(a) Based on all reported health conditions, not just the main reported health condition.

(b) Selected health conditions are not mutually exclusive because of co-morbidity.

Notes

1. Percentages are of the Australian population of that age and sex.
2. Estimates marked with * have an associated relative standard error of between 25% and 50%. These estimates should be interpreted accordingly.

Source: AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

Table 8.16 shows health conditions among older Australians with a severe or profound disability according to age groups. In the 65–74 year age group, the leading condition associated with severe or profound disability is arthritis, with 7.3% of women and 3.4% of men in the population having arthritis. In the 75–84 year age group, the percentages of men and women with a severe or profound disability were about double those for 65–74 year olds for each of the associated health conditions, with hearing loss for men (10% of the population) and arthritis for women (15%) the most common health conditions.

Among people aged 85 years or more, the proportion with a severe or profound disability rises sharply for most health conditions when compared with the 75–84 year age group. However, because so many people aged 85 years or more have multiple health conditions, it cannot be said to what extent particular health conditions may have contributed to the level of disability.

Table 8.16: Proportion with a severe or profound core activity restriction, by health condition, 1998

	Males				Females			
Selected health condition[(a) (b)]	**65–74**	**75–84**	**85+**	**Total 65+**	**65–74**	**75–84**	**85+**	**Total 65+**
Dementia, incl. Alzheimer's	*1.1	4.1	15.8	3.0	*0.8	4.7	23.8	5.0
Other mental & behavioural	2.1	7.7	18.9	5.0	4.4	9.8	32.4	9.7
Stroke	2.2	5.9	14.6	4.2	2.0	7.1	13.2	5.2
Other cardiovascular disease	2.6	5.6	17.3	4.6	2.9	7.6	26.0	7.4
Respiratory	2.4	4.2	*9.7	3.5	2.3	3.1	6.0	3.0
Cancer	*0.9	*1.2	*4.9	1.3	*0.8	*1.0	**1.1	0.9
Diabetes	1.5	3.7	*6.4	2.5	1.6	4.0	7.2	3.1
Vision	1.9	5.7	19.6	4.3	2.2	7.8	23.9	6.8
Hearing	3.8	10.2	34.6	7.9	2.9	10.6	38.2	9.9
Arthritis	3.4	7.1	22.4	5.9	7.3	14.9	34.0	13.2
Other musculoskeletal	3.3	5.6	16.4	4.9	4.5	11.7	19.3	8.8

(a) Based on all reported health conditions, not just the main reported health condition.

(b) Selected health conditions are not mutually exclusive because of co-morbidity.

Notes

1. Percentages are of the Australian population of that age and sex.
2. Estimates marked with ** have an associated relative standard error (RSE) of 50% or more. Estimates marked with * have an associated RSE of between 25% and 50%. These estimates should be interpreted accordingly.

Source: AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

Overview of prevalence of disability

At a broad level, the 1998 ABS Survey of Disability, Ageing and Carers estimated that 1,222,600 people aged 65 or over (54% of Australians of that age) had a disability which had lasted, or was likely to last, for at least six months and which restricted everyday activities.

Among older people with a disability, 536,000 were males and 686,700 were females. Of these, 480,400 people, or 21% of the population aged 65 or more, reported a severe or profound core activity restriction, meaning that they sometimes or always needed personal assistance or supervision with activities in the areas of self-care, mobility and communication.

The rate of severe or profound restrictions increased with age. The rate was substantially higher for those aged 85 or more (65%) than for those aged 65–74 (11%) and those aged 75–84 (26%). Although the rates of disability for males and females aged 65 and over were both around 54%, the rate of severe or profound core activity restrictions for females (25%) was substantially higher than that for males (16%).

Table 8.17: Persons with a disability, by disability status and severity, 1998

	Age group (years)							
	65–74	75–84	85+	Total 65+	65–74	75–84	85+	Total 65+
Disability status	Number ('000)				Per cent			
Males								
Severe or profound	59.6	64.0	38.5	162.1	9.7	20.7	56.1	16.3
Non severe or profound	228.1	126.3	19.5	373.9	37.1	40.9	28.4	37.7
Total disability	*287.7*	*190.2*	*58.0*	*536.0*	*46.8*	*61.6*	*84.5*	*54.0*
No disability	326.7	118.4	10.7	455.8	53.2	38.4	15.5	46.0
Total male population	*614.4*	*308.7*	*68.7*	*991.8*				
Females								
Severe or profound	80.6	130.1	107.6	318.3	11.9	29.2	68.9	24.9
Non severe or profound	204.1	140.5	23.8	368.3	30.2	31.5	15.2	28.8
Total disability	284.7	270.7	131.3	686.7	42.2	60.7	84.1	53.8
No disability	390.1	175.3	24.7	590.1	57.8	39.3	15.9	46.2
Total female population	*674.8*	*446.0*	*156.1*	*1,276.8*				
Persons								
Severe or profound	140.2	194.1	146.1	480.4	10.9	25.7	65.0	21.2
Non severe or profound	432.2	266.8	43.3	742.2	33.5	35.4	19.2	32.7
Total disability	**572.4**	**460.9**	**189.4**	**1,222.6**	**44.4**	**61.1**	**84.3**	**53.9**
No disability	716.9	293.7	35.4	1,046.0	55.6	38.9	15.7	46.1
Total population	**1,289.2**	**754.6**	**224.8**	**2,268.6**				

Note: Percentages are of the Australian population of that age and sex.

Source: AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

Main disability groups

The prevalence of disability groups can be estimated from the ABS disability surveys using information from a number of questions on impairments, activity limitations and participation restrictions. There are five broad disability groups used to describe prevalence: intellectual and learning disability, psychiatric disability, sensory and speech disability, acquired brain injury, and physical and diverse disability (AIHW 2003b).

Physical and diverse disabilities were the most frequently reported disabilities among older Australians. A physical or diverse disability is associated with the presence of an impairment which may have diverse effects within and among individuals, including effects on physical activities (AIHW 2003b). An estimated 1,124,600 (50%) Australians aged 65 or more reported one or more physical or diverse disabilities. Of these, 1,082,200 (48% of Australians of that age) also reported one or more activity limitation(s) or participation restriction(s); 458,300 (20%) had a severe or profound core activity restriction.

The second most commonly reported group was sensory or speech disabilities. One or more sensory or speech disabilities were reported by 718,900 people aged 65 or more, or 32% of Australians of that age. Of these, 689,000 people aged 65 or over (30% of Australians of that age) also reported one or more activity limitations or participation restrictions; 305,500 people (14%) had a severe or profound core activity restriction.

Psychiatric disability was reported by 264,800 people (12%), of whom 263,600 had activity limitations or participation restrictions, and 188,400 (8.3%) had a severe or profound core activity restriction.

Disability associated with an acquired brain injury was reported by 52,000 people (2.3% of Australians of that age), of whom 50,800 (2.2%) had activity limitations or participation restrictions; of these, 38,200 (1.7%) had a severe or profound core activity restriction.

The age patterns of prevalence show that considering all reported disabling conditions, intellectual disability mainly occurred among people aged 85 or over (24%), and was likely to be associated with dementia-related conditions (AIHW 2003b). Most people who had intellectual disability also reported a severe or profound core activity restriction (just under 24% of those aged 85 or more).

In contrast, sensory or speech disability and physical or diverse disability were quite commonly reported by people aged 65–74 and 75–84 years (22% and 41% respectively of 65–74 year olds), although the highest proportions were among those aged 85 or over (65% and 78% respectively). People aged 65–74 who reported these disabilities were less likely than other disability groups to have a severe or profound core activity restriction.

Disability trends among the older population

In Australia, there has been a consistent increase in the overall reported rate of disability for almost two decades. The ageing of the population aged 65 years and over has had a strong impact on disability prevalence among older Australians. Compared with the 1981 disability survey, the three later surveys (1988, 1993 and 1998) reported substantially higher rates of disability for the older population. The disability rates for people aged 65 and over increased from 43% in 1981 to over 50% in the later surveys. The rate of severe or profound restrictions for people aged 65 and over increased between 1993 and 1998, from 17% to 20%. The estimated number of people with a severe or profound restriction increased markedly among those aged 75 or over (AIHW 2003b).

It has been suggested that about half of the increase in the rate of severe or profound core activity restriction between 1993 and 1998 in the population aged 65 years and over is due to changes in survey methods and the other half is attributable to population ageing and probably an actual increase in the prevalence among the oldest age groups of the population (ABS: Davis et al. 2001; AIHW 2003b). Changes in the 1998 survey screening question on learning and understanding things may have increased the number of people reporting conditions associated with dementia. The separate identification of head injury, stroke and other brain damage may have led to increased reporting of stroke among the older population.

Recently reported declines in disability prevalence among the older population in some OECD countries such as the United States have been a subject of vigorous debate. Different trends (increases or decreases) in disability prevalence have been reported among the OECD countries (for example Robine et al. 1998; Jacobzone et al. 2000; Manton & Gu 2001; Schoeni et al. 2001; AIHW 2003b). A decline in reported disability prevalence occurred at the same time as an increase in the reported prevalence of chronic conditions in some OECD countries. Increases in chronic conditions were also reported in countries where no decline in disability overall was reported, such as Australia.

Table 8.18: Estimates of main disability groups among older Australians, 1998

	Age group							
	65–74	75–84	85+	Total 65+	65–74	75–84	85+	Total 65+
Disability groups	Number ('000)				Per cent			
All disabling conditions[(a)]								
Intellectual	26.2	45.3	54.6	126.1	2.0	6.0	24.3	5.6
Psychiatric	92.6	97.5	74.7	264.8	7.2	12.9	33.3	11.7
Sensory/speech	278.3	295.4	145.2	718.9	21.6	39.1	64.6	31.7
Acquired brain injury	21.6	20.3	10.2	52.0	1.7	2.7	4.5	2.3
Physical/diverse	524.5	425.6	174.6	1,124.6	40.7	56.4	77.7	49.6
All disabling conditions and activity limitations and participation restrictions								
Intellectual	26.2	45.3	54.6	126.1	2.0	6.0	24.3	5.6
Psychiatric	91.4	97.5	74.7	263.6	7.1	12.9	33.3	11.6
Sensory/speech	256.0	287.8	145.2	689.0	19.9	38.1	64.6	30.4
Acquired brain injury	20.4	20.3	10.2	50.8	1.6	2.7	4.5	2.2
Physical/diverse	494.2	413.5	174.5	1,082.2	38.3	54.8	77.6	47.7
All disabling conditions and severe or profound core activity restrictions								
Intellectual	22.1	42.2	52.8	117.1	1.7	5.6	23.5	5.2
Psychiatric	44.4	73.1	70.8	188.4	3.4	9.7	31.5	8.3
Sensory/speech	71.0	122.1	112.4	305.5	5.5	16.2	50.0	13.5
Acquired brain injury	13.2	15.9	9.1	38.2	1.0	2.1	4.0	1.7
Physical/diverse	135.1	185.5	137.7	458.3	10.5	24.6	61.3	20.2
Main disabling condition[(b)]								
Intellectual	**1.5	**1.8	**0.4	*3.7	**0.1	**0.2	**0.2	*0.2
Psychiatric	22.5	32.8	32.0	87.3	1.7	4.3	14.2	3.8
Sensory/speech	85.6	80.6	27.5	193.7	6.6	10.7	12.2	8.5
Acquired brain injury	**2.1	**1.4	**0.1	*3.5	**0.2	**0.2	**0.0	*0.2
Physical/diverse	460.7	344.3	129.4	934.4	35.7	45.6	57.6	41.2
Main disabling condition and severe or profound core activity restrictions								
Intellectual	**0.9	**0.3	**0.4	**1.6	**0.1	**0.0	**0.2	**0.1
Psychiatric	12.7	28.8	31.9	73.4	1.0	3.8	14.2	3.2
Sensory/speech	12.0	18.9	15.9	46.8	0.9	2.5	7.1	2.1
Acquired brain injury	**1.0	**1.1	**0.1	**2.1	**0.1	**0.1	**0.0	**0.1
Physical/diverse	113.7	144.9	97.9	356.5	8.8	19.2	43.6	15.7

(a) All persons reporting the disabling condition in the survey.

(b) Only persons reporting the disabling condition as the main condition in the survey.

Notes

1. Percentages are of the Australian population of that age and sex.
2. Estimates marked with ** have an associated relative standard error (RSE) of 50% or more. Estimates marked with * have an associated RSE of between 25% and 50%. These estimates should be interpreted accordingly.

Source: AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

8.6 Health risk factors

The health of older Australians is affected by their risk factors throughout their lives, and the health effects are often cumulative. So, the onset of many diseases and injuries in older Australians is affected by risk factors present when they were younger. Ideally, analyses of the effects of health risk behaviour should take a longitudinal approach, so that the long-term effects of risk factors can be identified. However, a longitudinal analysis is beyond the scope of this report and only health risk factors at older ages are presented in this section.

The major preventable risk factors for onset of disease and injury in older Australians are:

- overweight and obesity;
- inadequate physical activity;
- smoking;
- consumption of alcohol at levels considered at risk for health;
- poor diet and nutrition; and
- falls.

In addition to these, high blood pressure and high blood cholesterol levels were major long-term problems of middle and older age reported in the 2001 National Health Survey. These are risk factors for a range of cardiovascular diseases, but they can be managed with appropriate medical treatment.

Socioeconomic disadvantage is also a significant risk factor for poor health among people aged 65 and over. Mathers (AIHW 1994) found that men aged 65 and over living in areas in Australia classified into the quintile of greatest socioeconomic disadvantage had death rates 14% higher than those living in areas in the quintile of least disadvantage. For women aged 65 and over, the differential was only slightly smaller (11%).

Prevalence of risk factors in the 65 years and over age group

Between the 1989–90 and 2001 ABS National Health surveys, changes have been observed in some of the major health risk factors for Australians aged 65 years and over.

Obesity

Between 1989–90 and 2001, there has been a substantial rise in the proportions of males and females who are obese. From self-reports in the National Health Survey, the percentage of males who were obese increased from 9% to 15% for 65–74 year olds and from 4% to 9% for those 75 years and over. The increases for females were from 11% to 20% for 65–74 year olds and from 7% to 11% for those 75 years and over. (For a fuller analysis of obesity trends among older Australians, see AIHW: Bennett et al. 2004.)

Exercise levels

A high proportion of men and women aged 65 and over are sedentary or exercise at low levels—63% and 74% respectively of men aged 65–74 and 75 and over, and 76% and 85% respectively of women in 2001. There was little change in these numbers from 1989–90.

Smoking

There was a welcome large decline in the prevalence of smoking among both men and women aged 65 years and over between 1989–90 and 2001. In the 65–74 year age

group, the percentage of male smokers dropped from 20% in 1989–90 to 12% in 2001, and the percentage for females fell from 14% to 9%. In the 75 years and over age group, the percentage of male smokers dropped from 11% in 1989–90 to 7% in 2001, and the percentage for females from 6% to 5%.

Consumption of alcohol at levels considered at risk for health

In 2001, 9% and 5% respectively of men aged 65–74 and 75 and over, and 7% and 5% respectively of women in these age groups, reported alcohol consumption at levels at risk to their health. For those aged 75 years and older this was a rise on the self-reported proportions in 1989–90 of 2.5% of males and 2.2% of females.

Table 8.19: Risk factors for persons aged 65–74 years and 75 and over, 1989–90, 1995 and 2001 (per cent)

		Age group			
	Year of	65–74	75+	65–74	75+
Population characteristic	survey	Males		Females	
Underweight	1989–90	1.6	4.6	5.3	9.0
	1995	1.1	3.0	3.2	7.0
	2001	0.6	1.6	2.1	5.8
Overweight	1989–90	40.6	27.9	27.5	20.6
	1995	39.7	31.4	26.4	20.6
	2001	44.8	35.3	32.0	23.9
Obese	1989–90	9.4	4.2	11.2	7.2
	1995	10.5	4.7	13.5	6.9
	2001	14.6	8.9	20.1	10.5
Exercise level: sedentary	1989–90	35.2	41.5	39.3	57.8
	1995	35.6	44.9	43.7	54.0
	2001	30.9	44.0	38.8	55.9
Exercise level: low	1989–90	26.9	28.5	34.7	29.1
	1995	28.8	28.7	32.0	28.4
	2001	31.9	30.4	36.9	29.1
Smoker	1989–90	19.7	11.1	13.8	6.3
	1995	17.5	10.3	11.3	6.9
	2001	12.4	7.4	9.4	4.8
Risky/high-risk alcohol consumption	1989–90	9.1	2.5	7.3	2.3
	1995	5.8	2.2	7.2	3.3
	2001	7.0	4.7	8.0	4.6

Source: ABS National Health Surveys, ABS Cat. No. 4364.0, 2001.

8.7 Use of selected services

General practitioner consultations

Information on consultation with general practitioners (GPs) is available from the BEACH survey, a continuous survey of general practice activities conducted by the AIHW General Practice Statistics and Classification Unit at the University of Sydney. Details of the BEACH survey are provided in Chapter 6. Results of the survey detail the nature and amount of services older Australians receive from their GPs.

Older Australians presented to GPs with higher rates of symptoms, medical conditions and chronic conditions than people less than 65 years of age. Consultation times were significantly longer, and the number of problems managed and prescriptions per 100 encounters were significantly higher. Consultations with patients aged 65 years and over were longer than with younger patients (averaging 15.4 minutes compared with 14.9 minutes). The longest consultations were with patients aged 75 years or more (an average of 15.6 minutes). Home visits and visits in hospital or residential aged care occurred significantly more often in the 75 years and over age group.

Problems were managed at a rate of 171.2 per 100 encounters and medications were prescribed, recommended or supplied at a rate of 131.6 per 100 encounters, equivalent to 76.9 medications per 100 problems managed. These rates for persons 65 years and over were much higher than the equivalent rates for all general practice encounters—143.4 problems managed, and 108.2 medications prescribed, recommended or supplied, per 100 patient encounters. For patients aged 65 years and over, medications for the cardiovascular system were the most commonly prescribed, at an average of 31.6 prescriptions per 100 encounters. Among these, antihypertensives (17.0 per 100 encounters) were the most frequently prescribed.

Table 8.20: Problems most commonly managed by GPs, persons aged 65 years and over, 2000–02

	65–74 years	75 years and over	Total 65 and over
	Rate per 100 patient encounters		
Problem most commonly managed by ICPC-2 chapter			
Circulatory (cardiovascular)	36.1	40.5	38.4
Musculoskeletal	22.9	21.5	22.2
Respiratory	20.5	17.1	18.8
Skin	16.1	18.9	17.6
Endocrine & metabolic	19.2	12.5	15.7
General & unspecified	13.4	15.1	14.3
Psychological	9.6	12.5	11.1
Digestive	10.6	10.2	10.4
Urology	3.6	4.6	4.1
Ear	3.5	3.6	3.6
Individual problems most commonly managed			
Hypertension	20.7	19.2	19.9
Osteoarthritis	6.1	6.4	6.2
Immunisation/vaccination	6.9	5.5	6.2
Diabetes	7.0	4.9	5.9
Lipid disorder	6.7	3.1	4.8
Coronary heart disease	3.3	4.3	3.8
Prescription (all)	3.2	3.3	3.2
Sleep disturbance	2.4	3.5	3.0
Depression	2.9	2.7	2.8
Oesophageal disease	2.9	2.5	2.7
Heart failure	1.5	3.8	2.7

Note: ICPC = International Classification of Primary Care.

Source: O'Halloran et al. 2003.

The individual problems most commonly managed were hypertension (19.9 per 100 encounters), osteoarthritis (6.2 per 100), immunisation/vaccination (6.2 per 100), diabetes (5.9 per 100), lipid disorder (4.8 per 100) and coronary heart disease (3.8 per 100). Injuries, mainly due to falls, were managed at one in every 20 GP encounters for people aged 65 years and over.

The problems most commonly managed, by disease group, were cardiovascular system (38.4 per 100 encounters), musculoskeletal (22.2 per 100), respiratory (18.8 per 100), skin (17.6 per 100) and endocrine and metabolic problems (15.7 per 100).

At least one chronic condition was managed at 60.8% of encounters with patients aged 65 years and over, with 41.5% involving management of one chronic condition, 14.8% two chronic conditions, 3.8% three chronic conditions and 0.6% four chronic conditions. The chronic conditions most commonly managed were hypertension, osteoarthritis, diabetes, lipid disorder, coronary heart disease and depression.

Hospitalisation

In 2001–02 there were 2.1 million separations from Australian hospitals for persons aged 65 years and over. The separations per 1,000 population were high for people aged 65 years or more compared with the general population. In 2001–02, in the population of all ages, there were 307 separations per 1,000 population for males and 348 for females. For older Australians there were 742 hospital separations per 1,000 people aged 65–74 years, 1,012 per 1,000 people aged 75-84 and 1,014 per 1,000 people aged 85 years and over. For people 65 and over, separations per 1,000 population were 978 for males, 26% higher than the 778 per 1,000 population for females. However, women had much higher hospitalisation than men for falls, with 45,170 separations by females and 16,969 by males.

Public hospitals accounted for 62% of the separations and 69% of the patient days in 2001–02 for people aged 65 years and over, compared with 62% and 66%, respectively, for the population as a whole. The average stay in public hospitals for people aged 65 and over was 5.8 days, compared with 4.1 days for private hospitals.

Average length of stay in hospital increased with age in 2001–02. For males, average stay was 3.7 days for 65–74 year olds, 5.0 days for those 75–84 and 8.1 days for those 85 years and over. For females, average stay increased from 3.8 days for 65–74 year olds to 6.1 days for those 75–84 and to 9.7 days for those 85 years and over.

For males aged 65 years and over, the most common principal diagnoses in 2001–02 were neoplasms and chemotherapy for neoplasms (17% of separations), care involving dialysis (16%), stroke and other cardiovascular diseases (13%), and diseases of the digestive system (9%). These were also the most common conditions for females, with 13% of separations for neoplasms and chemotherapy for neoplasms, 12% for stroke and other cardiovascular diseases, 12% for care involving dialysis, and 10% for diseases of the digestive system.

There were significant differences in the conditions treated between public and private hospitals for people aged 65 and over. For example, most separations with a principal diagnosis of cancer were in public hospitals, but most separations for chemotherapy

treatment for cancer were in private hospitals. Most separations for musculoskeletal conditions and cataracts were in private hospitals, but public hospitals catered for the substantial majority of separations for diabetes, dementia, depression, cardiovascular diseases, and care involving dialysis or rehabilitation.

Table 8.21 : Separations, patient days and average length of stay by sex, age group, duration of stay and hospital sector, admitted patients aged 65 years and over, Australia, 2001–02

	Males			Females			Persons	
	65–74	75–84	85 & over	65–74	75–84	85 & over	65 & over	%
				Separations				
Public hospitals								
Overnight	150,776	133,614	49,633	120,901	157,709	94,501	707,137	33.1
Same day	188,963	117,813	16,836	155,830	103,998	23,145	606,586	28.4
Total	*339,739*	*251,427*	*66,469*	*276,731*	*261,707*	*117,646*	*1,313,723*	*61.5*
Private hospitals								
Overnight	71,566	87,532	23,278	67,130	87,499	39,790	376,795	17.6
Same day	115,698	97,456	13,442	114,701	87,492	16,140	444,939	20.8
Total	*187,264*	*184,988*	*36,720*	*181,831*	*174,991*	*55,930*	*821,734*	*38.5*
Total	**527,003**	**436,415**	**103,189**	**458,562**	**436,698**	**173,576**	**2,135,457**	**100.0**
				Patient days				
Public hospitals								
Overnight	1,215,367	1,301,240	590,312	1,018,514	1,711,118	1,201,571	7,038,128	63.7
Same day	188,963	117,813	16,836	155,830	103,998	23,145	606,586	5.5
Total	*1,404,330*	*1,419,053*	*607,148*	*1,174,344*	*1,815,116*	*1,224,716*	*7,644,714*	*69.2*
Private hospitals								
Overnight	413,682	678,807	220,111	446,633	755,953	440,212	2,955,398	26.8
Same day	115,698	97,456	13,442	114,701	87,492	16,140	444,939	4.0
Total	*529,380*	*776,263*	*233,553*	*561,334*	*843,445*	*456,352*	*3,400,337*	*30.8*
Total	**1,933,710**	**2,195,316**	**840,701**	**1,735,678**	**2,658,561**	**1,681,068**	**11,045,051**	**100.0**
				Average length of stay (days)				
Public hospitals								
Overnight	8.1	9.7	11.9	8.4	10.8	12.7	10.0	
Total	*4.1*	*5.6*	*9.1*	*4.2*	*6.9*	*10.4*	*5.8*	
Private hospitals								
Overnight	5.8	7.8	9.5	6.7	8.6	11.1	7.8	
Total	*2.8*	*4.2*	*6.4*	*3.1*	*4.8*	*8.2*	*4.1*	
All hospitals								
Overnight	7.3	9.0	11.1	7.8	10.1	12.2	9.2	
Total	**3.7**	**5.0**	**8.1**	**3.8**	**6.1**	**9.7**	**5.2**	
				Separations per 1,000 population				
All hospitals	819.5	1,202.0	1,215.2	669.3	873.3	923.4	866.6	

Source: AIHW National Hospital Morbidity Database.

Table 8.22: Separations by principal diagnosis and hospital type, admitted patients aged 65 years and over, Australia, 2001–02

	Public hospitals			Private hospitals			All hospitals	
Principal diagnosis	**65–74**	**75–84**	**85+**	**65–74**	**75–84**	**85+**	**Total**	**%**
				Males				
Neoplasms	33,581	24,691	6,379	26,613	28,753	6,630	126,647	11.9
Chemotherapy for neoplasms	16,744	6,898	442	16,570	10,190	761	51,605	4.8
Diabetes	5,072	3,504	739	2,411	2,986	504	15,216	1.4
Dementia	716	1,695	1,006	71	352	186	4,026	0.4
Depression	1,079	2,114	396	815	688	71	5,163	0.5
Cataracts	5,466	5,713	1,379	9,953	16,358	3,406	42,275	4.0
Stroke	5,903	6,556	2,567	1,440	2,460	807	19,733	1.9
Other cardiovascular diseases	38,596	30,504	9,629	18,830	19,579	4,031	121,169	11.4
Diseases of the respiratory system	18,780	19,002	6,919	4,450	6,844	2,110	58,105	5.4
Diseases of the digestive system	27,578	18,194	5,044	26,756	19,779	3,260	100,611	9.4
Rheumatoid arthritis & osteoarthritis	3,443	1,752	292	5,410	3,684	389	14,970	1.4
Other musculosketal disorders	7,819	5,141	1,594	8,624	6,360	1,120	30,658	2.9
Injuries due to a fall	691	1,546	933	4,193	5,667	3,939	16,969	1.6
Care involving dialysis	85,378	49,690	2,029	13,648	13,807	915	165,467	15.5
Care involving rehabilitation	7,201	8,459	3,345	3,586	5,864	1,580	30,035	2.8
All other conditions	81,594	65,913	23,754	43,493	41,284	6,946	262,984	24.7
No recorded diagnosis	98	55	22	401	333	65	974	0.1
All separations	**339,739**	**251,427**	**66,469**	**187,264**	**184,988**	**36,720**	**1,066,607**	**100.0**
				Females				
Neoplasms	22,667	20,044	7,212	19,981	18,877	6,055	94,836	8.9
Chemotherapy for neoplasms	12,787	5,340	412	14,613	7,424	581	41,157	3.9
Diabetes	3,651	3,955	1,203	1,861	2,554	714	13,938	1.3
Dementia	551	1,851	1,634	94	440	395	4,965	0.5
Depression	1,755	2,227	474	1,615	1,466	421	7,958	0.7
Cataracts	7,025	10,281	2,898	15,402	25,324	6,513	67,443	6.3
Stroke	4,030	7,372	4,955	848	2,171	1,467	20,843	2.0
Other cardiovascular diseases	24,937	32,546	17,705	11,876	15,273	6,314	108,651	10.2
Diseases of the respiratory system	13,878	15,235	8,185	3,931	5,098	2,640	48,967	4.6
Diseases of the digestive system	24,037	20,873	9,302	27,848	20,449	5,249	107,758	10.1
Rheumatoid arthritis & osteoarthritis	4,619	3,418	841	6,341	5,085	813	21,117	2.0
Other musculosketal disorders	9,394	8,803	4,010	10,837	9,032	2,736	44,812	4.2
Injuries due to a fall	1,635	4,054	3,632	6,812	14,920	14,117	45,170	4.2
Care involving dialysis	67,550	33,861	969	13,062	8,097	580	124,119	11.6
Care involving rehabilitation	7,170	13,480	8,758	4,779	8,564	3,862	46,613	4.4
All other conditions	70,974	78,222	45,412	41,330	29,776	3,339	269,053	25.2
No recorded diagnosis	71	145	44	601	441	134	1,436	0.1
All separations	**276,731**	**261,707**	**117,646**	**181,831**	**174,991**	**55,930**	**1,068,836**	**100.0**
				Persons				
All separations	**616,470**	**513,134**	**184,115**	**369,095**	**359,979**	**92,650**	**2,135,443**	

Source: AIHW National Hospital Morbidity Database.

Medicare services

There are higher numbers of Medicare services per person for older Australians than for younger ages. Medicare services are those services provided by private medical practitioners, optometrists and some dental practitioners for which a contribution is paid by the Health Insurance Commission. In 2002–03, in the population of all ages, an average of 9.1 Medicare services were provided per person for males. This compares with 23.4 services per male among those aged 65–74 years and 21.9 for those aged 75 and over. Similarly, while females in the total population averaged 13.1 Medicare services per person in 2002–03, 65–74 year old females averaged 23.5 and those 75 and over 25.7.

This resulted in average Medicare benefits paid per person in 2002–03 for males aged 65–74 of $920 and for those aged 75 and over of $843, compared with the average for the male population of $339. Similarly, average Medicare benefits paid per person for females aged 65–74 of $882 and for those aged 75 and over of $954 were much higher than the average for the female population of $476.

Table 8.23: Average number of Medicare services per Australian resident, 2002–03

Age group	Males	Females
0–4	8.36	7.62
5–9	4.33	4.30
10–14	3.89	3.96
15–19	4.29	7.64
20–24	4.58	10.38
25–34	5.40	12.85
35–44	7.04	12.18
45–54	9.89	14.30
55–64	14.82	18.03
65–74	23.41	23.51
75 and over	21.92	25.73
All	9.11	13.14

Source: Department of Health and Ageing.

Table 8.24: Average Medicare benefits paid per person, age and sex, 2002–03

Age group	Males ($)	Females ($)
0–4	259.99	229.60
5–9	138.13	130.06
10–14	133.05	129.47
15–19	151.22	241.86
20–24	159.07	325.32
25–34	192.11	451.34
35–44	258.95	460.51
45–54	376.88	543.84
55–64	582.63	687.13
65–74	920.04	882.49
75 and over	842.69	954.06
All	338.66	475.68

Source: 2002–03 Health Insurance Commission Annual Report.

Support services for older Australians with health conditions

A number of support programs are available to older Australians who meet health criteria. The main ones include provision of residential aged care, Home and Community Care (HACC), and Community Aged Care Packages (CACPs), although actual provision does not include persons who qualify but have yet to be placed in care, and the usage levels are affected by the supply of services. To enter residential care, or to receive a CACP, people must have the appropriate recommendation from an Aged Care Assessment Team. The HACC program target group are those people aged 65 years or more with moderate, severe or profound disability, and their carers (AIHW 2003).

On 30 June 2002 there were 10 permanent aged care residents per 1,000 population in the 65–74 year age group, 55 per 1,000 population in the 75–84 year age group and 247 per 1,000 population in the 85 years and over age group. In addition, on 30 June 2002, there were 3 CACP recipients per 1,000 population aged 65–74, 11 per 1,000 population aged 75–84, and 30 per 1,000 population aged 85 years or more.

Provision of HACC assistance for those living in private households also increased rapidly with age. In 2001–02, there were 87 HACC clients per 1,000 population aged 65-74, 245 per 1,000 population aged 75–84 and 425 per 1,000 population aged 85 years or more (AIHW 2003).

8.8 Health expenditure on diseases of older Australians

Eighty six per cent of recurrent health expenditure in Australia in 2000–01 can be allocated to specific diseases. In that year, people aged 65 years and over, who represented 12.5% of the population, accounted for 38.0% of total allocatable health expenditure. People aged 65–74 years (6.8% of the population) accounted for 14.4% of health expenditure, people aged 75–84 years (4.3% of the population) 15.0%, and people aged 85 and over (1.3% of the population) 8.2%.

Table 8.25: Estimated resident population and allocatable health expenditure, 2000–01 (per cent)

Age group	% of population 30 December 2000	% of health expenditure 2000–01
0–64	87.5	62.0
65–74	6.8	14.7
75–84	4.3	15.0
85 and over	1.3	8.2
65 and over	12.5	38.0

Sources: ABS Cat. No. 3101.0; AIHW.

Average health expenditure per person rises sharply with advancing age in the older age groups. Average per person health expenditure in 2000–01 was $5,509 for 65–74 year olds, $8,895 for 75–84 year olds, and $15,690 for people aged 85 and over, compared with $1,807 for persons aged less than 65 years.

More than half of all health expenditure on the following diseases is spent on persons aged 65 years and over:

- Dementia, 98% of all expenditure
- Stroke, 83%
- Arthritis 69%, and
- Vision problems 61%.

Cardiovascular diseases had the highest per person expenditure, $1,146, of any medical condition for persons aged 65 years and over in 2000–01, followed by dementia ($901)

and cancer ($586). However, among persons aged 85 years and over, highest levels of per person expenditure were for dementia ($4,086), cardiovascular diseases ($1,580) and arthritis ($918).

Table 8.26: Proportion of total allocatable health expenditure: selected health conditions, 2000–01

Health condition	Males 65+	Females 65+	Persons 65+	Persons 65–74	Persons 75–84	Persons 85+
	Per cent of allocatable health expenditure					
All conditions	36.4	39.3	38.0	14.7	15.0	8.2
Dementia, incl. Alzheimers	96.1	98.8	98.1	9.7	40.7	47.7
Other mental & behavioural	15.4	23.5	20.0	8.2	8.6	3.2
Stroke	77.5	87.5	82.8	23.0	36.8	23.0
Other cardiovascular diseases	40.5	39.8	40.2	17.8	16.4	5.9
Respiratory	24.8	23.7	24.3	10.7	9.5	4.1
Cancer	43.2	33.1	38.4	18.3	15.3	4.8
Diabetes	38.0	23.7	26.5	12.3	9.7	4.5
Vision disorders	57.7	62.6	60.6	21.7	28.2	10.7
Hearing disorders	20.8	27.3	23.3	12.8	6.4	4.2
Arthritis	62.2	72.7	69.1	25.3	26.9	17.0
Other musculoskeletal	18.2	24.6	22.0	9.0	8.8	4.2
Other conditions	35.9	38.1	37.1	16.0	14.0	7.1
	Percent of Australian population of that age and sex at 30 June 2001					
	11.1	13.8	12.5	6.8	4.3	1.3

Source: AIHW.

Table 8.27: Total allocatable expenditure: selected health conditions by age group, 2000–01

Health condition	Average expenditure per person ($) Under 65	65–74	75–84	85+	65+	Expenditure, all persons ($m)
Dementia, incl. Alzheimers	105	163	1,080	4,086	901	2,209
Other mental	162	214	351	421	283	3,410
Stroke	26	157	396	799	309	896
Other cardiovascular diseases	226	931	1,350	1,580	1,146	6,856
Respiratory	194	351	490	687	435	4,311
Cancer	134	511	676	680	586	3,672
Diabetes	118	254	317	469	299	2,707
Vision disorders	16	101	207	252	154	611
Hearing disorders	14	29	23	49	29	300
Arthritis	44	269	451	918	401	1,397
Other musculoskeletal	193	314	486	741	419	4,573
Other conditions	577	2,218	3,067	5,008	2,811	18,232
All conditions	**1,807**	**5,509**	**8,895**	**15,690**	**7,773**	**49,174**

Source: AIHW.

8.9 Selected conditions

Dementia

Dementia, including Alzheimer's disease, is a major cause of severe and profound disability, and the prevalence of disability from it increases rapidly with increasing age. With the expected ageing of the Australian population, the number and the proportion of the older population with dementia requiring health care and assistance are expected to increase.

Table 8.15, reporting from the ABS Survey of Disability, Ageing and Carers, shows that the prevalence of dementia among those aged 85 and over was 16.4% and 23.9% respectively for males and females compared with just under 5% for males and females aged 75–84 and about 1% for those aged 65–74. These prevalence rates estimated from the ABS survey are considerably lower than the rates for most OECD countries, especially for people aged less than 85 years (AIHW 2004). The main reason for this difference is that the ABS survey relied on self- or carer-reporting and that people with mild or even moderate dementia might have little contact with health or aged care services that would result in an identification of the condition (AIHW 2004).

Projections based on an average of prevalence rates in OECD countries (Jorm et al. 1987) indicate that the number of Australians affected by dementia is expected to increase by 50% in 18 years from 161,300 in 2002 to 242,700 in 2020. Reflecting the projected changes in the age structure, the largest numerical increase is expected to be among those aged 85 and above, although the largest percentage increase is expected to be in the 65–74 age group.

Table 8.28: Projected number of people with dementia, Australia, 2002 and 2020

Age	2002	2020	% increase
65–74 years	27,600	47,400	71
75–84 years	68,300	92,500	35
85 years & over	65,400	102,800	57
65 years & over	161,300	242,700	50

Source: AIHW 2002, AIHW 2004.

The increasing prevalence of dementia among older Australians is reflected in the health and aged care services provided. In general practice in 2001–02 dementia was managed at a rate of 0.50 per 100 GP–patient encounters, an increase of about 20% on the rate of 0.42 per 100 encounters in 1998–99. The percentage of Aged Care Assessment Team clients who had a primary diagnosis of dementia increased from 18% in 1994–95 to 21% in 2001–02. Similarly, dementia is affecting an increasing proportion of residents of residential aged care. In 1998, 65% of permanent residents of residential aged care were identified as being possibly or probably affected by dementia, whereas this proportion increased to 80% in 2002. Dementia sufferers also represent a relatively high proportion of persons receiving the Community Aged Care Package and assistance under the Extended Aged Care at Home program—18% and 32% respectively in 2002.

With the projected ageing of the population, including those aged 65 and over, it can be expected that the number and proportion of people affected by dementia and the demand for dementia-related services will increase. Details of the impact of dementia among older Australians are contained in the AIHW publication *The Impact of Dementia on the Health and Aged Care Systems* (AIHW 2004).

Vision conditions

In the 2001 ABS National Health Survey, 96–98% of men and women in each of the 65–74, 75–84 and 85 and over age groups reported that they were suffering from long-term diseases of the eye and adnexa. Table 8.14 revealed that in 1998 there were an estimated 227,300 Australians aged 65 and over with vision problems and, of the 76,900 whose main long-term health condition was a vision problem, 43% had a severe or profound level of disability and a further 42% a moderate or mild level of disability.

Complete or partial blindness

Among males in 2001, 1.9% of 65–74 year olds, 3.9% of 75–84 year olds and 5.8% of those aged 85 and over reported in the National Health Survey that they suffered from complete or partial blindness. For females the corresponding figures were 2.1%, 3.4% and 11%.

Cataracts

A cataract is the partial or complete clouding of the lens of an eye or its capsule. Cataracts are a serious problem for both men and women in older age. Among males in the ABS National Health Survey in 2001, 6.0% of 65–74 year olds, 12% of 75–84 year olds and 10% of those aged 85 and over reported cataracts as a long term medical condition. For females the proportions are much higher—10% of 65–74 year olds, 22% of 75–84 year olds and 28% of those aged 85 and over.

Hospital separation rates for cataracts in 2001–02 reflect this high prevalence. Men aged 65–69 experienced 1,720 hospital separations per 100,000 population. This increased with age to peak at 6,982 separations per 100,000 population for 80–84 year olds. The rates for women were higher—2,241 separations per 100,000 population for 65–69 year olds, peaking at 7,547 separations per 100,000 population for 80–84 year olds. In 2001–02, there were 120,333 cataract surgeries performed on people aged 65 years and over in Australian hospitals—47,059 on males and 73,274 on females.

Glaucoma

Glaucoma is a group of eye disorders in which pressure within the eye is so high that it damages nerve fibres in the retina and optic nerve and may lead to blindness. In the ABS National Health Survey in 2001, around 4% of men aged 65–74 years and 6% of those aged 75–84 and 85 and over reported suffering from glaucoma. Around 5% of women aged 65–74 years, 6% of those aged 75–84 and 8% of those aged 85 and over also reported having glaucoma in 2001.

Hospital separation rates for glaucoma for men were 51 per 100,000 population for 65–69 year olds rising to 201 per 100,000 population for 80–84 year olds. For women there were 62 separations per 100,000 population for 65–69 year olds rising to 168 per 100,000 population for 80–84 year olds.

Diabetic retinopathy

In 2001, just under 11% of 65–74 and 75–84-year-old men and 6% of those 85 years or more reported having diabetes, with 12% of women aged 65–74, 10% of those aged 75–84 and 11% of those aged 85 years or more also reporting the disease. It is not known what proportion of these had diabetic retinopathy (damage to the retina) which can lead to blindness. In 2001–02, there were 150 hospital separations per 100,000 population among 65–69 year old males for diabetic retinopathy. The separation rate peaked at 167 per 100,000 population for 70–74 year olds and declined to 111 per 100,000 population for those 85 and over. The rates were lower for women—93 per 100,000 separations for 65–69 year olds and a peak of 126 per 100,000 population for 80–84 year olds.

Table 8.29: Hospital separations per 100,000 population for eye conditions, 2001–02

		Age group								
Sex	**Condition**	**45–49**	**50–54**	**55–59**	**60–64**	**65–69**	**70–74**	**75–79**	**80–84**	**85+**
Males	Cataract	110.5	244.3	457.2	889.8	1,720.5	3,167.3	5,574.3	6,982.1	5,650.4
	Glaucoma	6.6	12.3	18.8	34.0	50.7	88.8	150.0	201.3	135.7
	Diabetic retinopathy	46.1	46.4	89.8	131.5	149.7	167.3	164.7	116.1	110.9
	AMD	1.2	2.1	4.9	13.6	21.5	35.3	36.5	40.0	23.6
	Blindness & low vision	0.3	1.4	1.3	1.2	3.2	2.0	7.4	9.0	13.0
Females	Cataract	99.8	238.0	476.8	1,105.2	2,241.0	4,377.2	6,846.3	7,547.2	5,019.7
	Glaucoma	6.5	10.8	14.7	32.1	61.9	108.3	144.4	168.2	106.6
	Diabetic retinopathy	22.2	50.4	40.5	67.2	92.7	121.9	110.3	125.6	82.1
	AMD	1.2	2.2	8.7	26.1	44.2	47.4	30.4	26.2	13.3
	Blindness & low vision	1.0	1.1	0.0	1.2	2.9	5.7	6.8	6.3	9.1

Note: AMD = age-related macular degeneration.

Source: AIHW analysis of the National Hospital Morbidity Database.

Oral health

The oral health of older Australians has improved considerably since the 1970s. National dental health telephone surveys conducted by AIHW's Dental Statistics and Research Unit (DSRU) from 1979 to 2002 showed that the proportion of the population aged 65 years and more with no natural teeth (that is, who are edentulous) fell from 66% in 1979 to 50% in 1987–88 to 40% in 1994 and then to 34% in 2002 (DSRU: various publications). Tooth loss represents a history of substantial oral disease, indicating not only a potential need for dental prostheses, but also the need to maintain existing restorations and the remaining natural teeth (AHMAC Steering Committee for National Planning for Oral Health 2001).

A result of this rapidly rising proportion of older Australians with natural teeth is that their dental needs are very different from those of older Australians in past years. The percentage of 65–74 year old respondents in private households who consulted a dentist in the two weeks before interview in the ABS National Health Survey increased from 4.6% in 1989–90 to 6.1% in 2001, while the percentage of those aged 75 years and over who consulted a dentist increased from 2.0% to 4.9% over the same period.

However, the oral health of residents of some aged care facilities and of health card holders in the general community has been found to be much poorer than for other older Australians. A survey of nursing home residents in South Australia in 1997 found that 67% were edentulous, compared with 38% of Australians aged 65 years or more in 1996 (Chalmers et al. 1999a & 1999b). Part of this difference is because the nursing home residents represented an older group. Of those in the nursing homes with teeth, there were an average number of 11.9 teeth present, of which an average of 1.1 were decayed teeth, 1.1 were retained tooth roots, and 3.8 were filled. Only 23% of the nursing home residents did not need assistance cleaning teeth; this reflects the high proportion of nursing home residents with dementia and other disability. Residents with dementia gave carers many complex problems in providing oral hygiene care. A one-year follow-up of the South Australian nursing home residents found that the oral health status of new residents was poor and oral diseases, especially coronal and root caries, progressed rapidly during the residents' stay (Chalmers et al. 2001).

In 2002, health card holders in the National Dental Telephone Interview Survey were found to be over five times as likely to have lost all their teeth as the general adult population. Health card holders with some natural teeth also had twice the level of tooth loss of the general population (Carter & Stewart 2003).

8.10 Summary

This chapter has presented a range of key statistics on the demography and health of Australians aged 65 years or more. It has found that many more Australians are living to old age and their life expectancy at ages 65, 75 and 85 has been increasing. There have been large falls in death rates over the last decade. A large proportion of Australians in the age groups 65–74 and 75–84 years in particular live a healthy life without diseases and disability. Most live in their own homes and actively participate in society. However, the prevalence of diseases and disability increases with age. The disease pattern of those suffering ill health is mainly that of chronic disease. As the population aged over 65 years of age is becoming older, the level of chronic conditions and disability will correspondingly increase and there will be a rising demand for support services, including palliative care.

A summary of the key findings in this chapter follows.

Demographic trends

- The population aged 65 years and over is growing relatively rapidly. Of the three age groups 65–74, 75–84 and 85 years and over, the largest percentage rises between 1991 and 2001 were in the 85 years and over age group, with an 85% increase in males and a 67% increase in females.
- The population aged 65 years and over is projected to nearly double over the next 20 years.
- Life expectancy at age 65 for males increased from 15.4 years (80.4) in 1991 to 17.2 years (82.2) in 2001, and from 19.3 years (84.3) to 20.7 years (to 85.7) for females over the same period.

Trends in mortality

- There were substantial declines in death rates for persons aged 65 years or more during the decade from 1993 to 2002, largely due to major declines in death rates for cardiovascular diseases for both men and women.

Wellbeing

- The great majority of people in the age groups 65–74, 75–84 and 85 years and over reported in 2001 that they had good to excellent health.
- In 2001 the great majority of older Australians were living at home.
- In 2001 there were 181,000 people aged 65 and over in the labour force, 7.8% of the age group. In 2000 a total of 528,000 people aged 65 and over had undertaken unpaid voluntary work during the previous 12 months.
- In 2002 three quarters of people aged 65–74 and more than 60% of those aged 75 and over had attended a cultural venue or event during the previous 12 months.
- In the 12 months before interview in 2002, 51% of males and 41% of females aged 65 and over had participated in selected sport and physical activities. The most popular activity by far was walking for exercise, undertaken by 25%.
- In 2001, 17% of males and 11% of females aged 65–74, and 8.3% of males and 3.0% of females aged 75 and over, were using a computer at home, with most computer users also accessing the Internet.

Health conditions and levels of disability

- The health condition of old age which has the highest level of severe to profound disability is dementia. In 1998, dementia, including Alzheimer's disease, was reported in 22% of people aged 85 years or more. Of the estimated 97,800 people aged 65 years or more with dementia in that year, 96% had severe or profound disability, and only 2.8% had moderate or mild disability.
- The next most disabling conditions after dementia were other mental health conditions, eyesight diseases and stroke.
- The most common health conditions among older people with disabilities in 1998 were arthritis (801,000 people) and hearing conditions (663,900 people).
- Overall, 54% of people aged 65 and over in 1998 had a long term disability which restricted everyday activities. Some 21% of the population aged 65 and over had a severe or profound disability. At age 85 and over, 65% had a severe or profound disability, compared with 11% of those aged 65–74 years.

Risk factors

- Most older Australians either do not exercise at all or have low levels of physical activity, and a high proportion of those in the 65–74 year age group are overweight or obese.
- In 2001, 9% and 5% respectively of men aged 65–74 and 75 and over, and 7% and 5% respectively of women in these age groups, reported alcohol consumption at levels at risk to their health.

- While the proportion of older Australians who are smoking has been declining, 12% of males and 9% of females aged 65–74, and 7% of males and 5% of females aged 75 years and over, were smokers in 2001.

Use of selected services

- Australians aged 65 years and over not only consulted GPs more frequently than younger people but also presented with higher rates of symptoms and more medical conditions. There was a high frequency of management of one or more chronic conditions—a rate of 61 per 100 general practice encounters for persons aged 65 years and over.
- Consultation times for patients aged 65 and over were longer and the number of prescriptions per 100 patient encounters was much higher than for the patient population as a whole.
- The most common problems of people aged 65 years and over managed in general practice, by disease group, were problems of the circulatory (cardiovascular) system (38.4 per 100 encounters), musculoskeletal system (22.2 per 100), respiratory system (18.8 per 100), skin (17.6 per 100), and endocrine and metabolic system (15.7 per 100).
- Hospitalisation rates are high for older Australians. In 2001–02, there were 742 hospital separations per 1,000 people aged 65–74 years, 1,012 per 1,000 people aged 75–84 and 1,014 per 1,000 people aged 85 years and over.
- In 2002–03, in the population at large, an average of 9.1 Medicare services were provided per person for males. This compares with 23.4 services per male among those aged 65–74 years and 21.9 for those aged 75 and over. Similarly, females in the total population averaged 13.1 Medicare services per person in 2002–03, but 65–74 year old females averaged 23.5 and those 75 and over 25.7.
- On 30 June 2002 there were 10 permanent nursing home and other aged care residents per 1,000 population in the 65–74 year age group, 55 per 1,000 population in the 75–84 year age group and 247 per 1,000 population in the 85 years and over age group. In addition, on 30 June 2002, there were 3 Community Aged Care Package recipients per 1,000 population aged 65–74, 11 per 1,000 population aged 75–84, and 30 per 1,000 population aged 85 years or more.
- In 2001–02, there were 87 Home and Community Care clients per 1,000 population aged 65–74, 245 per 1,000 population aged 75–84 and 425 per 1,000 population aged 85 years or more.

Health expenditure

- 86% of recurrent health expenditure in Australia in 2000–01 can be allocated to specific diseases. In that year, people aged 65 years and over, who represented 12.5% of the population, accounted for 38.0% of allocatable health expenditure.
- Average health expenditure per person rises sharply with advancing age in the older age groups. Average per person allocatable health expenditure in 2000–01 was $5,509 for 65–74 year olds, $8,895 for 75–84 year olds, and $15,690 for people aged 85 and over, compared with $1,807 for persons aged less than 65 years.

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Appendix: National Health Priority Areas

The National Health Priority Areas (NHPA) is an initiative of the Australian Health Ministers Conference (AHMC), involving collaboration between the Commonwealth, state and territory governments. The initiative seeks to focus public attention and health policy on those areas that contribute significantly to the burden of disease and injury, but offer scope for improvement (NHPAC 2002).

The NHPA initiative acknowledges that in order to relieve the burden of disease, a holistic approach to health care must be taken, encompassing prevention of disease and injury through to treatment and ongoing management. Currently seven different health areas have been marked for priority attention as NHPAs, namely cardiovascular health, cancer control, injury prevention and control, mental health, diabetes mellitus, asthma, and arthritis and other musculoskeletal conditions.

This appendix provides an overview of NHPAs, in terms of morbidity, disability and mortality. Information is also provided on their overall burden, in terms of disability adjusted life years (DALY) as well as direct health care costs. The appendix also examines the relationships between various NHPAs in terms of co-morbidity and shared risk factors. Time-series information on NHPA indicators is given in Tables S58 to S63.

Focus diseases and conditions

The NHPA initiative has a special focus on specific diseases and conditions within each priority area; these are listed below. However, in this overview, reference to an NHPA includes all diseases and conditions within that priority area, and not just the focus diseases and conditions.

- **Asthma**
- **Cardiovascular health**
  Coronary heart disease; stroke; heart failure; and peripheral vascular disease
- **Cancer control**
  Lung cancer; melanoma; non-melanocytic skin cancers; cancer of the cervix; breast cancer; colorectal cancer; prostate cancer; and non-Hodgkin's lymphoma (NHL)
- **Diabetes mellitus**
  Type 1 diabetes; Type 2 diabetes; and gestational diabetes
- **Injury prevention and control**
  Prevention of falls in older people; falls in children; drowning and near drowning; and poisoning in children
- **Mental health**
  Depression, and depression as a co-morbidity or complication of other NHPAs
- **Arthritis and other musculoskeletal conditions**
  Osteoarthritis, rheumatoid arthritis; and osteoporosis.

Impact of NHPAs on the health of Australians

The impact of individual NHPAs varies considerably in terms of health outcomes. Table A.1 provides an overview of this impact using indicators based on self-reported prevalence, associated disability levels, death rates, and DALY.

Arthritis and other musculoskeletal conditions are the most prevalent NHPAs. Based on the 2001 National Health Survey, it is estimated that almost one in three Australians (32.0%) have the condition. Arthritis and other musculoskeletal conditions are also the main disabling condition for more than one in three Australians with a disability (34.4%). However, arthritis and other musculoskeletal conditions are not a major cause of mortality.

Cardiovascular disease on the other hand is the largest contributor to the burden of disease (21.9% of all DALY in 1996), and the most common underlying cause of death (37.6% of all deaths in 2002). The prevalence of cardiovascular problems is also relatively high, affecting almost one in six Australians (16.8%).

Table A.1: Indicators of the impact of NHPA diseases and conditions (various years)

	Prevalence[(a)] (2001)		Disability (1998)		Deaths[(b)] (2002)		Burden of disease (1996)	
NHPA	**Number '000**	**Per cent population**	**Number '000**	**Per cent persons with disability**	**Number '000**	**Per cent all deaths**	**DALYS '000**	**Per cent total DALY**
Cardiovascular problems	3,185.9	16.8	312.2	8.6	50.3	37.6	548.6	21.9
Cancer	267.6	1.4	60	1.7	37.6	28.1	478.6	19.1
Mental disorders[(c)]	1,812.6	9.6	529.2	14.7	3.2	2.4	333.9	13.3
Injury and poisoning[(c)]	2,241.9	11.9	245.7	6.8	7.8	5.8	209.9	8.4
Diabetes	554.2	2.9	64.4	1.8	3.3	2.5	122.5	4.9
Asthma	2,197.3	11.6	171.1	4.7	0.4	0.3	64.5	2.6
Arthritis[(d)]	6,058.1	32.0	1,240.2	34.4	1.0	0.8	89.9	3.6
All NHPAs	**9,765.5[(e)]**	**51.6[(e)]**	**2,622.8**	**72.7**	**103.6**	**77.5**	**1,847.9**	**73.8**

(a) Self-reported, estimates based on 2001 National Health Survey. All health conditions are long-term except injury which is recorded if occurring in the four weeks prior to interview.

(b) Deaths registered in 2002.

(c) Suicide is included with Injury and poisoning.

(d) Arthritis and musculoskeletal conditions.

(e) Because of the presence of more than one NHPA disease or condition, the total for all NHPAs is less than the sum of numbers in the columns above.

Sources: ABS 1998; ABS 2003; AIHW: Mathers et al. 1999; AIHW National Mortality Database.

Morbidity

The extent of morbidity associated with NHPAs can be gauged from a variety of data sources, with some useful insights into the extent of the problem. However, none of these data sources cover the whole spectrum of illness and morbidity associated with NHPA diseases and conditions. The picture that emerges is therefore composite in nature, and invariably incomplete.

Prevalence

From self-reports, based on 2001 National Health Survey, it is estimated that 51.6% of Australians suffer long-term from one or more NHPA disease or condition (Table A.1). As indicated earlier, arthritis and other musculoskeletal conditions are the most prevalent of these. Cardiovascular problems, injuries, asthma and mental disorders are other highly prevalent NHPAs. However, much smaller proportions of respondents reported having diabetes or cancer. Table A.2 presents prevalence rates for a select set of NHPA diseases and conditions in the two sexes.

Self-reported disease prevalence data have certain inherent problems, in particular if the symptoms are not apparent to the individual. For example, about 2.9% of 2001 National Health Survey respondents reported having diabetes. The 1999–2000 AusDiab survey, using biomedical tests, however, has determined that about one-half of persons with diabetes are unaware of their disease (Dunstan et al. 2001). The AusDiab survey puts the prevalence of diabetes among those aged 25 and over at around 7.0%, in comparison to the much lower estimate based on 2001 National Health Survey self reports.

Table A.2: Prevalence[(a)] of selected NHPA diseases and conditions in Australia, 2001

	Prevalence rate (per 100,000 population)	
NHPA disease or condition	**Males**	**Females**
Cardiovascular disease	125.1	149.8
Cancer	19.6	10.0
Diabetes	30.4	29.1
Asthma	105.0	126.2
Injury	145.4	94.6
Mood (affective) problems	34.3	55.2
Anxiety related problems	33.8	56.0
Osteoarthritis	56.5	91.7
Rheumatoid arthritis	20.2	26.6
Osteoporosis	6.0	25.3

(a) Prevalence rates, given as per 100,000 population, are age-standardised to the Australian population on 30 June 2001.

Source: AIHW analysis of the ABS National Health Survey, 2001.

Hospital separations

Hospital separations represent a different part of the spectrum of NHPA morbidity. In 2001–02, they accounted for about 1.8 million principal diagnoses, or around 29.8% of all hospital separations. They also accounted for about 10 million patient-days (43.7% of the total patient days) that year (Table A.3).

Cardiovascular disease (23.2% of all NHPA-related hospital separations), injuries (22.9%), arthritis and other musculoskeletal conditions (18.4%) and cancer (16.6%) were the major contributors to NHPA-related hospital separations.

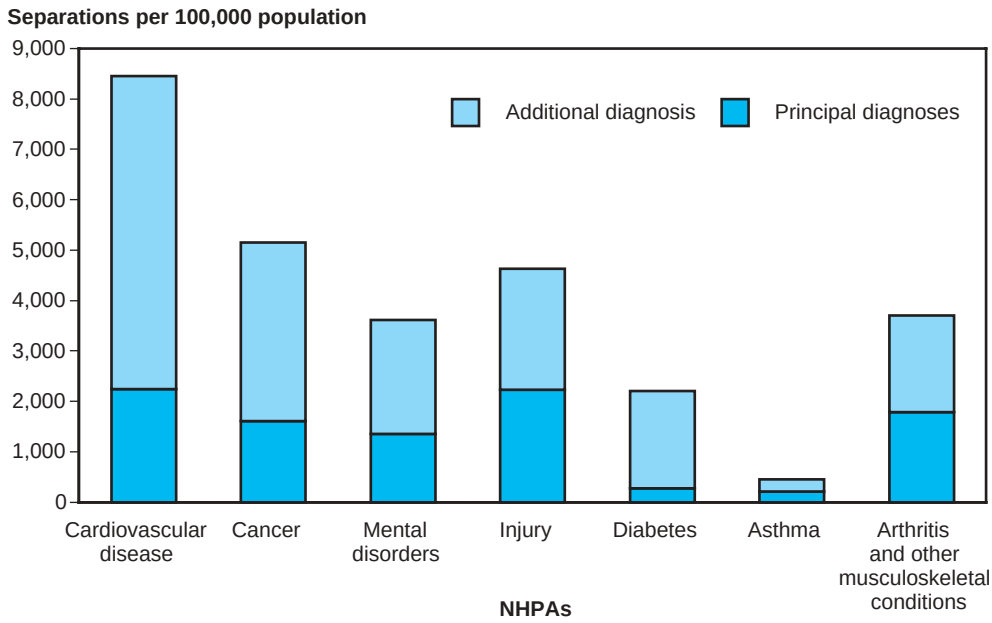
Many of the NHPA diseases and conditions, as well as being the main reason for hospitalisation (principal diagnosis) may also be a contributor to hospitalisation for other reasons (additional diagnoses). Diabetes in particular accounts for a much larger

proportion of additional diagnoses than as a principal diagnosis, especially in relation to cardiovascular disease (Figure A.1). In almost 15% of separations with cardiovascular disease as a principal diagnosis, diabetes was listed as an additional diagnosis in 2001–02.

Table A.3: Hospital separations for National Health Priority Areas[(a)], all hospitals[(b)], 2001–02

	All separations		Same day separations		Patient days	
Principal diagnosis	**Number '000**	**Per 1,000 population[(c)]**	**Number '000**	**Per cent of all separations**	**Number '000**	**Average length of stay**
Cardiovascular disease	441.0	22.6	103.0	23.4	2,272.7	5.2
Cancer	316.7	16.2	140.8	44.5	1,624.6	5.1
Mental disorders	264.5	13.5	113.8	43.0	2,742.7	10.4
Injury	436.5	22.4	137.4	31.5	1,814.0	4.2
Diabetes	53.2	2.7	17.7	33.2	301.9	5.7
Asthma	41.0	2.1	7.3	17.9	104.1	2.5
Arthritis[(d)]	351.1	18.0	146.7	41.8	1,278.7	3.6
Total NHPA separations	*1,903.9*	*97.5*	*666.7*	*35.0*	*10,138.7*	*5.3*
All separations	6,398.2	327.6	3,348.8	52.3	23,201.0	3.6

(a) Only separations for which the principal diagnosis corresponds to one of the priority areas have been included. These conditions will also have been reported as additional diagnoses for separations with principal diagnoses not within these priority areas.
(b) Includes public psychiatric hospitals.
(c) Crude rates.
(d) Arthritis and other musculoskeletal conditions.
Source: AIHW National Hospital Morbidity Database.



Source: AIHW National Hospital Morbidity Database.

Figure A.1: Hospital separations for NHPA diseases and conditions, 2001–02

Mortality

NHPA diseases and conditions are the underlying cause in more than three out of four deaths. In 2002, they accounted for 103,649 deaths, or 77.5% of all deaths, in Australia. Table A.4 ranks various NHPA diseases and conditions among the 20 leading causes of death.

Some of the cardiovascular diseases and cancers are responsible for large number of deaths. Coronary heart disease (19.5% of all deaths) and stroke (9.4%) were the leading individual causes of death in 2002, followed by lung cancer (6.1%). In comparison, asthma and arthritis and other musculoskeletal conditions are small contributors to death rates. These highly prevalent diseases tend to contribute more to illness and disability than death (Tables A.1 and A.4).

Death rates have declined for most of the NHPA diseases conditions over the past decade or so and for many NHPA conditions for the past 30 to 40 years. The declines in death rates for coronary heart disease and stroke since the late 1960s, and lung cancer in males since the early 1980s, have been most pronounced, contributing significantly to reduction in death rates overall. Contrasting these trends, lung cancer death rates for females have increased since coding began in the 1940s, and death rates for mental disorders have shown an overall increase since the mid-1960s (AIHW GRIM 2003).

Table A.4: Ranking of various NHPA diseases and conditions as an underlying cause of death, 2002

		Deaths		Ranks	
NHPA	Underlying cause of death	Number	Per cent of all deaths	Males	Females
Cardiovascular disease	Coronary heart disease	26,063	19.5	1	1
	Stroke	12,533	9.4	2	2
	All cardiovascular diseases	*50,294*	*37.6*		
Cancer	Lung cancer	8,110	6.1	3	6
	Breast cancer	2,698	2.0	. .	5
	Colorectal cancer	4,649	3.5	7	8
	Prostate cancer	2,852	2.1	6	. .
	Lymphomas	1,597	1.2	18	16
	All cancers	*37,622*	*28.1*		
Injury and poisoning	Suicide	2,320	1.7	8	20
	Land transport accidents	1,826	1.4	13	. .
	Accidental poisoning	568	0.4	. .	. .
	Accidental falls	629	0.5	. .	. .
	Accidental drowning	232	0.2	. .	. .
	Fire, burns and scalds	115	0.1	. .	. .
	All injury and poisoning	*7,820*	*5.8*		
Diabetes	*All diabetes*	*3,329*	*2.5*	*9*	*10*
Mental disorders	*All mental disorders*	*3,172*	*2.4*	. .	. .
Asthma	*Asthma*	*397*	*0.3*	. .	. .
Arthritis[(a)]	*All arthritis[(a)]*	*1,015*	*0.8*	. .	. .

. . Not applicable because not in top 20 causes of death.

(a) Arthritis and other musculoskeletal conditions.

Source: AIHW National Mortality Database.

Disability and activity restriction

NHPA diseases and conditions are the cause of much disability in the community. Based on the 1998 Survey of Disability, Ageing and Carers, it is estimated that of 3.6 million Australians with a disability, 72.7% had an NHPA disease or condition as their main disabling condition (ABS 1998). Of those with a disability, 34.4% had arthritis and other musculoskeletal conditions as their main disabling condition—the largest contributor to disability. Mental disorders and cardiovascular disease were the other large contributors (Table A.5).

NHPAs contribute similarly to the most severe category of disability. Of the estimated 540,000 Australians with a profound core activity restriction, 71.5% had an NHPA disease or condition as their main disabling condition (Table A.5). The largest contributors to profound core activity restriction were: mental disorders (29.3%), arthritis and other musculoskeletal conditions (19.6%), and cardiovascular disease (14.2%).

Table A.5: National Health Priority Areas and disability, 1998

	Profound core activity restriction		All persons with disability	
Main disabling condition	**Number '000**	**Per cent**	**Number '000**	**Per cent**
Cardiovascular disease	76.6	14.2	312.2	8.6
Cancer	8.4	1.6	60	1.7
Mental disorders	157.5	29.3	529.2	14.7
Injury and poisoning	21.9	4.1	245.7	6.8
Diabetes	1.1	0.2	64.4	1.8
Asthma	13.8	2.6	171.1	4.7
Arthritis and other musculoskeletal conditions	105.2	19.6	1,240.2	34.4
Total NHPA related	***384.5***	***71.5***	***2,622.8***	***72.7***
Non-NHPA diseases or conditions	153.2	28.5	987.5	27.3
Total	**537.7**	**100.0**	**3,610.3**	**100.0**

Source: ABS 1998.

Disability-adjusted life years (DALYs)

NHPA diseases and conditions are estimated to contribute about 73.8% of the total burden of disease in Australia. Of the seven NHPAs, cardiovascular disease is the largest contributor to DALY (21.9%), followed by cancer, mental disorders and injuries (AIHW: Mathers et al. 1999). Arthritis and other musculoskeletal conditions, diabetes and asthma are responsible for relatively smaller proportions of the burden (Table A.1).

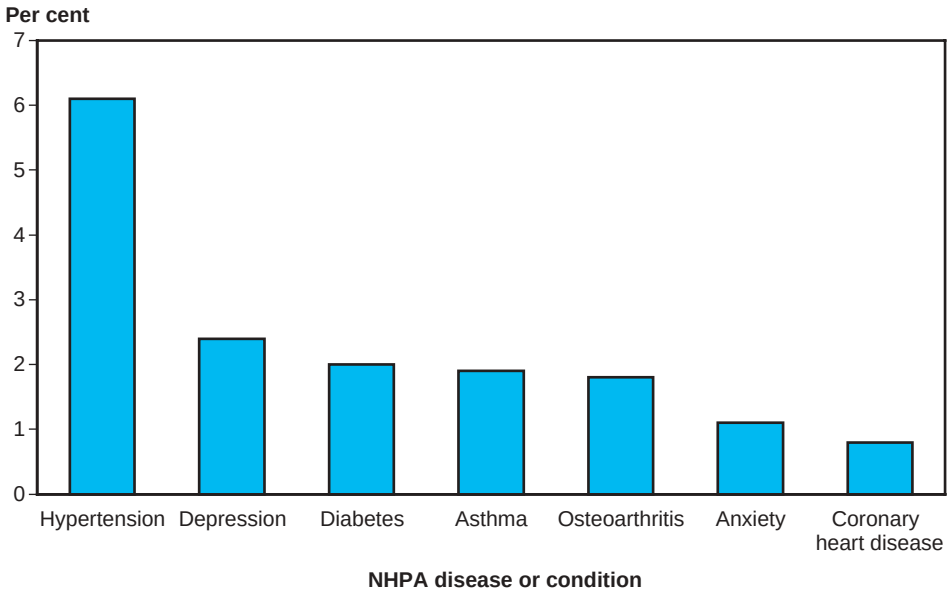
Use of health care services

The high morbidity, disability and mortality associated with NHPAs leads to substantial use of health care services and therefore expenditure on health care. Two of the largest areas of health care use, general medical practice and the hospital system, provide some insight into this aspect of NHPAs.

GP visits

In Australia, a visit to a general practice is usually the first point of healthcare contact. Consulting a doctor is the most common action related to health care taken by Australians. About 24% of Australians visited a GP in the two weeks prior to the 2001 National Health Survey (ABS 2002).

Of the problems managed by GPs in 2002–03 (AIHW: Britt et al. 2003), 29.3% (or 43 problems per 100 encounters) were related to NHPA diseases or conditions. Hypertension was the most frequently managed problem (6.1% of all problems managed), followed by depression (2.4%). Diabetes, asthma, osteoarthritis, anxiety and coronary heart disease were among the top ten problems managed (Figure A.2).



Source: AIHW National Hospital Morbidity Database.

Figure A.2: NHPA-related problems managed by GPs, 2002–03

Hospitalisation and emergency department visits

As described earlier, NHPAs accounted for 29.8% of all hospital separations in 2001–02. Cardiovascular disease accounted for the largest proportion of NHPA separations, followed by injury. NHPAs also accounted for 43.7% of all patient days (Table A.3). Mental disorders were responsible for the highest number of these patient-days, followed by cardiovascular disease.

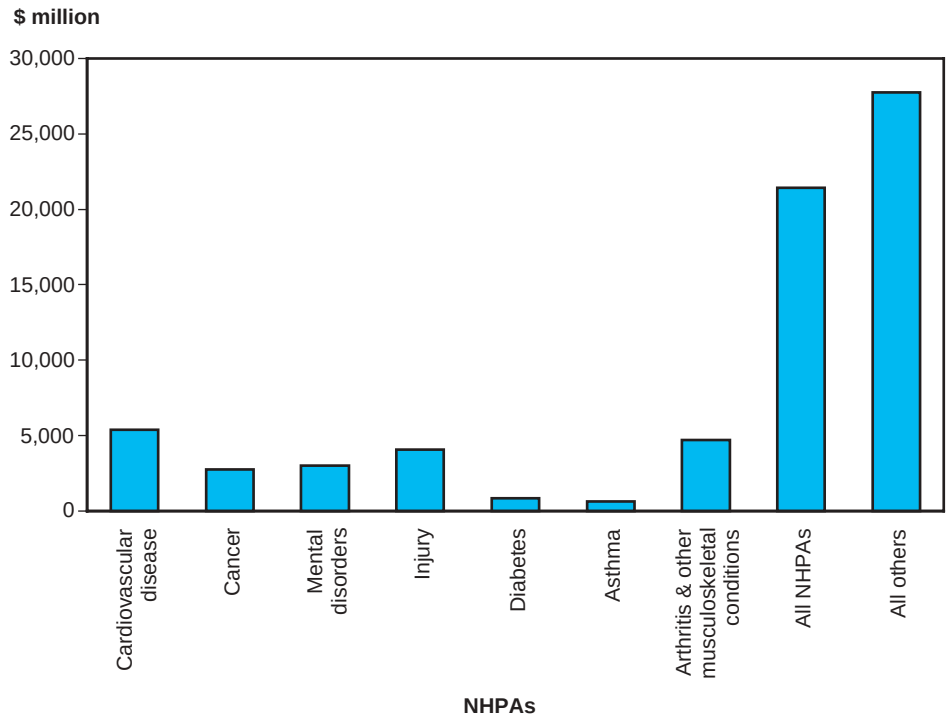
The average length of hospital stay (ALOS) for NHPA diseases and conditions was 5.3 days, compared with 3.6 days for all hospital separations, in 2001–02. The hospital stays were the longest for mental disorders and diabetes, with ALOS of 10.4 days and 5.7 days respectively. Asthma had the shortest ALOS at 2.5 days.

About 35.0% of NHPA hospital separations in 2001–02 were same-day separations, much lower than the average of 52.3% for all hospital separations. Cancer was the NHPA disease with the highest proportion of same-day separations (44.5%), followed by mental disorders (43.0%) and arthritis and other musculoskeletal disorders (41.8%). Chemotherapy-related separations are large contributors to the high proportion of same-day separations for cancer.

Health system costs

Cardiovascular disease, musculoskeletal conditions and injury were all major areas of health expenditure in 2001–02 (Figure A.3). Of the seven NHPAs, cardiovascular disease was the largest area of health expenditure in 2001–02—about $5.5 billion or 11% of allocated health system expenditure. This represented 26% of total NHPA health expenditure.

These estimates cover health system expenditure allocated to each disease. Expenditure on community and public health services, health administration, the transport of patients, and health aids and appliances is not included in the above estimates.



Source: AIHW 2004.

Figure A.3: Health system expenditure for NHPA areas, 2001–02

NHPA co-morbidity

NHPA diseases and conditions are generally chronic in nature and also share several risk factors. The simultaneous presence of more than one NHPA disease or condition is therefore not uncommon. Common NHPA co-morbidities include cardiovascular disease (in particular, coronary heart disease and stroke), diabetes and depression (Table A.6). Individuals with an NHPA disease or condition may also have other non-NHPA diseases or conditions.

Data from two different sources, 2001 National Health Survey self-reports and National Mortality Database, have been used to explore NHPA-related co-morbidities as described below.

Table A.6: Common co-morbidities for selected NHPA diseases and conditions

Selected NHPA disease or condition	Common co-morbidities[(a)]
Coronary heart disease	**Other vascular diseases (e.g. stroke, peripheral vascular disease)**, **diabetes**, **depression**
Stroke	**Other vascular diseases (e.g. coronary heart disease, peripheral vascular disease), diabetes**
Colorectal cancer	Inflammatory bowel disease (e.g. ulcerative colitis, Crohn's disease)
Depression	Anxiety, chronic pain and fatigue, blindness, deafness immobility, multiple sclerosis, **cardiovascular disease**, **diabetes, cancer, rheumatoid arthritis**
Diabetes	**Cardiovascular disease (e.g. coronary heart disease, stroke and peripheral vascular disease)**
Asthma	Respiratory conditions, eczema, sinusitis, hay fever, chronic obstructive pulmonary disease (COPD), **osteoporosis,** cataract, mood swings, heartburn and indigestion
Arthritis (non rheumatoid)	**Osteoarthritis**, inflammatory joint diseases (e.g. gout, **rheumatoid arthritis)**, **cardiovascular disease**
Rheumatoid arthritis	Respiratory and infectious diseases, gastrointestinal disorders, **non-Hodgkin's lymphoma**, secondary amyloidosis, **depression**
Osteoporosis	Chronic liver disease, chronic renal disease**, rheumatoid arthritis**, hyperparathyroidism, hypogonadism

(a) NHPA diseases or conditions are given in bold letters.

Source: AIHW 2002.

Self-reports

Arthritis and other musculoskeletal conditions are the most common long-term NHPA accompaniments. Table A.7 shows these co-morbidities based on 2001 National Health Survey self-reports. In particular, 72% of those reporting injury as a long-term condition also reported the presence of arthritis and other musculoskeletal conditions. Cardiovascular disease was the other commonly co-occurring disease.

Table A.7: Multiple reporting of NHPA diseases or conditions, 2001

Index long-term condition	Other long-term conditions (per cent)						
	Cardio-vascular disease	Cancer	Injury and poisoning	Mental disorders	Diabetes	Asthma	Arthritis[(a)]
Cardiovascular disease	. .	3.6	16.4	12.1	9.4	12.3	57.8
Cancer	43.0	. .	19.3	10.6	5.6	11.1	62.0
Injury and poisoning	23.1	2.3	. .	16.9	3.5	14.1	78.2
Mental disorders	21.2	1.6	21.1	. .	3.6	17.0	47.7
Diabetes	54.0	2.8	14.3	11.9	. .	14.1	57.8
Asthma	17.8	1.4	14.5	14.0	3.6	. .	35.3
Arthritis[(a)]	30.4	2.7	29.1	14.3	5.3	12.8	. .

. . Not applicable.

(a) Arthritis and other musculoskeletal conditions.

Note: Percentages in rows can add to more than 100.0 due to the presence of multiple conditions in individuals.

Source: Derived from 2001 National Health Survey.

Associated causes of death for the NHPAs

Death certificates are another useful source of co-morbidity information. These records not only provide information about the cause of death leading directly to death (the underlying cause of death) but also about those causes that contributed to events around death in some way (associated causes of death).

While cardiovascular disease is the largest underlying cause of death, it is also the cause mentioned most frequently as an associated cause of death (Table A.8). Of 133,707 deaths, 50,294 certificates recorded a cardiovascular disease as an underlying cause of death in 2002. In another 27,202 deaths, a cardiovascular disease was mentioned as an associated cause (and the underlying cause of death was not cardiovascular disease).

Cancer, the second largest underlying cause of death, on the other hand, is listed less often as an associated cause of death. While 37,622 deaths recorded cancer as the underlying cause of death in 2002, cancer was an associate cause of death in 4,826 cases (where underlying cause of death was not cancer).

Table A.8: National Health Priority Areas as underlying and/or additional causes of death, 2002

NHPA	Number of deaths		
	As an associated cause of death(A)	As an underlying cause of death (U)	Ratio (A/U)
Cardiovascular disease	27,202	50,294	0.5
Cancer	4,826	37,622	0.1
Injury and poisoning	5,104	7,820	0.7
Mental health	9,453	3,172	3.0
Diabetes	8,138	3,329	2.4
Asthma	1,027	397	2.6
Arthritis[(a)]	4,020	1,015	4.0

(a) Arthritis and other musculoskeletal conditions

Source: AIHW National Mortality Database

NHPAs most likely to be mentioned as associated causes are diabetes, arthritis and other musculoskeletal conditions and injuries (Table A.8). Deaths due to injury will usually have at least one associated cause of death mentioned—the cause of the injury and the resulting injury.

Risk factors

A variety of risk factors affect the onset, treatment and prognosis of various NHPA diseases and conditions (AIHW 2002). While some of the risk factors such as smoking and physical inactivity are modifiable, several others such as age and heredity are largely non-modifiable. Table A.9 lists risk factors for various NHPAs.

Table A.9: Known risk factors for diseases and conditions in each NHPA

NHPA disease/ condition	Non-modifiable risk factors	Modifiable risk factors
Diabetes Type 1	Heredity	
Diabetes Type 2	Age, heredity, pregnancy, low birth weight, age	Excess weight (particularly obesity), impaired glucose tolerance, physical inactivity, poor diet and nutrition, low birth weight
Asthma	Family history	Excess weight, allergens, exercise, emotion, respiratory tract infections in infancy, low birth weight, viral infections, tobacco smoke, food, chemicals, drugs
Coronary heart disease	Age, male sex, family history	Tobacco smoking, physical inactivity, alcohol misuse, poor diet and nutrition, high blood pressure, high blood cholesterol, excess body weight, diabetes
Stroke	Age, male sex, family history	High blood pressure, high blood cholesterol, atrial fibrillation, transient ischaemic attack, tobacco smoking, alcohol misuse, excess body weight, physical inactivity, poor diet and nutrition
Lung cancer	Age, male sex	Tobacco smoking, environmental tobacco smoke, exposure to asbestos or radon
Colorectal cancer	Heredity, personal or family history of polyps or colorectal cancer, inflammatory bowel disease, age	Poor diet and nutrition, physical inactivity, excess weight
Depression	Family history of depression, being a female adolescent, high trait anxiety and pre-existing anxiety disorders, temperament—reacting negatively to stressors, negative thought patterns, avoidant coping style	Poverty, unemployment, conflict, poor parenting practices, child abuse, exposure to adverse life events, carers of those with chronic physical or mental disorder, older age, residential care
Arthritis	Genetic, female sex, age	Joint trauma and injury, obesity, repetitive occupational joint use, physical inactivity
Osteoporosis	Female sex, family history, low levels of oestrogen after menopause, amenorrhoea lasting more than 6 months before the age of 45, early menopause (before age 45)	Low body weight, low calcium intake, low vitamin D levels, physical inactivity, smoking, alcoholism, use of corticosteroids
Injury prevention	Male sex, younger and older age groups, non-metropolitan areas, lower socioeconomic status	Alcohol consumption, participation in sporting activities and vigorous exercise, non-compliance with safety precautions (e.g. secured pool fencing, wearing seatbelts)
Suicide	Males 20–39 and 80 years and over, unmarried males	

Sources: AIHW 2002; Bradley & Harrison 2004; Steencamp & Harrison 2000; Brownson et al. 1998.

Several of the risk factors are shared by NHPA diseases and conditions (Table A.10). The most common of these are physical inactivity, excess weight, tobacco smoking, poor diet and nutrition, and excess consumption of alcohol. Less commonly shared risk factors are low birth weight, high blood pressure and high blood cholesterol. Diabetes, coronary heart disease, stroke and colorectal cancer between them share the most risk factors, namely physical inactivity, excess weight and poor diet and nutrition.

Table A.10: Common risk factors for the NHPA diseases and conditions

	Risk factor							
NHPA disease or condition	**Physical inactivity**	**Excess weight**	**Poor diet & nutrition**	**Tobacco smoking**	**Alcohol misuse**	**Low birth weight**	**High blood pressure**	**High blood cholesterol**
Type 2 diabetes	✓	✓	✓			✓		
Asthma				✓		✓		
Coronary heart disease	✓	✓	✓	✓	✓		✓	✓
Stroke	✓	✓	✓	✓	✓		✓	✓
Lung cancer				✓				
Colorectal cancer	✓	✓	✓					
Osteoarthritis	✓	✓						
Osteoporosis	✓			✓	✓			
Injury					✓			

Sources: AIHW 2002; Bradley & Harrison 2004; Steencamp & Harrison 2000; Brownson et al. 1998.

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Statistical tables

Population

Table S1: Estimated resident population, selected years, 1901 to 2003

Age group	1901	1921	1941	1961	1981	1991	2003[(a)]
Males							
0–4	172,957	307,300	299,900	573,700	583,218	652,302	648,266
5–14	450,067	570,800	575,300	1,056,600	1,321,340	1,290,729	1,392,666
15–24	366,146	457,900	627,900	776,100	1,320,618	1,405,897	1,404,302
25–34	320,455	451,800	593,900	728,000	1,244,663	1,416,512	1,435,054
35–44	279,558	369,500	496,000	737,900	931,360	1,319,366	1,486,726
45–54	156,674	281,300	432,400	627,800	772,879	960,260	1,347,680
55–64	99,170	208,400	307,600	427,800	661,984	734,081	1,022,663
65–74	64,716	90,900	173,100	266,300	426,174	548,636	656,206
75–84	18,731	29,300	70,900	102,300	158,247	243,406	386,658
85+	2,207	4,700	7,500	15,800	27,784	44,220	91,421
All ages	**1,977,928**	**2,771,900**	**3,584,500**	**5,312,300**	**7,448,267**	**8,615,409**	**9,871,642**
Females							
0–4	168,836	296,300	288,700	546,400	556,400	619,401	616,395
5–14	441,003	557,300	556,000	1,008,300	1,264,582	1,223,098	1,322,083
15–24	365,792	462,800	614,900	729,300	1,278,293	1,354,941	1,349,321
25–34	293,424	458,400	573,300	664,400	1,212,261	1,408,886	1,443,946
35–44	216,135	353,200	471,900	706,100	891,517	1,303,292	1,503,261
45–54	118,574	257,400	436,400	595,700	737,394	915,819	1,362,578
55–64	80,302	179,300	307,600	435,500	691,752	728,737	1,000,887
65–74	48,935	82,000	186,400	333,100	511,502	633,509	693,743
75–84	14,757	31,000	79,700	149,200	256,487	370,917	519,511
85+	2,038	5,500	10,500	27,900	74,805	110,027	198,102
All ages	**1,795,873**	**2,683,200**	**3,525,400**	**5,195,900**	**7,474,993**	**8,668,627**	**10,009,827**

(a) Preliminary data.

Note: Population estimates are for 30 June of each year.

Sources: ABS Cat. No. 3201.0; AIHW National Population Database.

Fertility and pregnancy

Table S2: Age-specific birth rates[(a)] and total fertility rates[(b)], 1921 to 2002 (live births per 1,000 females)

	Age group of mother (years)							Total fertility rate
	Less than 20	20–24	25–29	30–34	35–39	40–44	45 and over	
Annual averages								
1921–1925	27.3	133.7	167.0	137.0	96.9	40.4	4.2	3,032
1941–1945	23.9	126.9	152.8	114.3	66.3	21.1	1.7	2,535
1961–1965	46.5	204.0	207.2	122.4	59.2	17.5	1.2	3,289
1981–1985	25.7	100.8	144.5	82.0	25.4	4.4	0.3	1,915
1991–1995	21.2	71.6	128.3	104.2	39.3	6.4	0.3	1,857
Annual rates								
1998	18.9	61.4	111.4	107.0	45.5	8.0	0.3	1,762
1999	18.5	60.8	108.6	108.0	46.8	8.5	0.3	1,757
2000	17.7	59.2	107.9	109.5	48.7	8.7	0.4	1,760
2001	17.7	58.0	104.4	107.9	49.0	9.2	0.4	1,733
2002	17.1	55.5	104.2	111.2	52.2	9.7	0.4	1,752

(a) Age-specific birth rates are the live births registered during the calender 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.

Sources: ABS 1977; ABS Cat. No. 3303.0.

Table S3: Age-specific birth rates[(a)] and total fertility rates[(b)], states and territories, 2002 (live births per 1,000 females)

	Age group of mother (years)							Total fertility rate
State/Territory	Less than 20	20–24	25–29	30–34	35–39	40–44	45 and over	
NSW	16.4	57.7	106.7	112.9	54.4	10.7	0.5	1,796
Vic	11.2	42.8	96.5	116.9	57.7	10.2	0.5	1,679
Qld	22.3	64.5	109.1	105.0	45.2	8.1	0.4	1,773
WA	18.6	56.3	103.7	104.5	46.5	7.8	0.3	1,688
SA	15.4	53.3	103.4	111.2	51.0	9.6	0.6	1,723
Tas	28.3	85.9	123.1	103.5	43.1	8.6	0.4	1,964
ACT	11.2	35.4	93.8	111.8	53.6	11.9	0.4	1,591
NT	63.8	108.9	112.2	103.7	53.4	13.6	0.6	2,281
Australia	**17.1**	**55.5**	**104.2**	**111.2**	**52.2**	**9.7**	0.4	**1,752**

(a) Age-specific birth rates are the live births registered during the calender 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: ABS 2003a.

Table S4: Total fertility rates[(a)], crude birth rates rates[(b)] and male:female birth ratio, selected countries (latest available year)

	Total fertility rate		Crude birth rate		M:F birth ratio	
Country	**Year**	**Rate**	**Year**	**Rate**	**Year**	**Rate**
Australia	2002	1,752	2002	12.8	2002	105.1
Australia	2001	1,733	2001	12.7	2000	105.6
Canada	2000	1,490	2001	10.5	1998	104.8
Czech Republic	2001	1,140	2001	8.9	2000	107.3
Denmark	2001	1,740	2001	12.1	1999	104.8
Finland	2001	1,730	2001	10.8	2000	106.4
France	2001	1,900	2001	13.1	1999	105.4
Germany	2001	1,290	2000	9.3	1999	105.8
Greece	2001	1,290	2000	11.7	1999	106.4
Hungary	2001	1,320	2001	9.5	2000	106.1
Ireland	2001	1,980	2000	14.3	1999	106.4
Italy	2001	1,240	2000	9.4	1999	105.2
Japan	2000	1,410	2001	9.2	1999	105.6
Korea, Republic of	2001	1,300	2000	13.6	2000	110.2
Netherlands	2001	1,690	2001	12.7	1999	105.5
New Zealand	2001	1,970	2001	14.4	2000	106.2
Norway	2000	1,850	2001	12.6	1999	105.7
Poland	2001	1,290	2001	9.5	2000	106.2
Portugal	2001	1,420	2000	11.8	2000	107.7
Slovakia	2001	1,210	2001	9.5	2000	104.8
Spain	2001	1,250	2001	10.1	1998	107.3
Sweden	2001	1,570	2001	10.2	1999	105.3
Switzerland	2001	1,410	2001	10.2	1999	105.5
United Kingdom	2001	1,630	2000	11.4	1999	105.6
United States	2000	2,060	2001	14.2	1999	104.9

(a) 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.

(b) Live births per 1,000 mid-year population.

Sources: OECD 2003; WHO 2004; ABS 2003a.

Table S5: Birthweight distribution of total births[(a)], states and territories, 2000

Births/birthweight	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Births					**Number**				
Less than 2,500 g	5,661	4,176	3,478	1,753	1,295	392	364	356	17,475
All births	87,922	62,564	49,308	25,229	17,872	5,895	4,774	3,673	257,237
Birthweight (g)					**Per cent**				
Les than 500	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.4	0.3
500–999	0.5	0.5	0.6	0.5	0.6	0.4	0.8	0.5	0.5
1,000–1,499	0.6	0.6	0.7	0.7	0.9	0.9	0.8	0.9	0.7
1,500–1,999	1.2	1.3	1.4	1.2	1.4	1.3	1.8	2.0	1.3
2,000–2,499	3.8	3.9	4.0	4.2	4.0	3.7	3.9	6.0	4.0
Less than 2,500	6.4	6.7	7.1	6.9	7.2	6.7	7.6	9.8	6.8
2,500–2,999	14.6	15.4	14.0	15.6	15.2	14.3	12.6	20.6	14.9
3,000–3,499	34.9	36.1	34.5	36.1	34.7	33.2	34.0	34.5	35.1
3,500–3,999	31.3	30.1	31.3	30.2	30.7	32.2	32.1	25.3	30.8
4,000–4,499	10.8	9.9	11.2	9.5	10.3	11.4	11.2	8.5	10.5
4,500 and over	2.1	1.8	1.9	1.6	1.9	2.2	2.5	1.4	1.9

(a) Includes live births and foetal deaths (stillbirths) with known birthweight. Totals include births with unstated birthweights.

Source: AIHW National Perinatal Statistics Unit.

Table S6: Infant mortality rates, states and territories, selected years 1901 to 2002 (per 1,000 live births)

Year	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
1901	103.7	102.9	101.9	128.9	100.1	89.0	(a)	62.5	103.6
1921	62.6	72.5	54.2	78.3	65.5	78.0	74.1	63.3	65.7
1941	43.8	36.2	39.1	35.3	32.5	49.0	16.4	83.3	39.7
1961	20.8	17.8	20.0	19.7	20.0	16.8	15.6	23.9	19.5
1981	10.2	9.3	10.4	8.9	8.0	12.3	8.9	23.5	10.0
1991	7.2	6.5	7.6	7.2	5.5	9.0	7.6	14.2	7.1
1998	4.3	4.7	6.4	5.0	4.0	5.7	6.0	12.4	5.0
1999	5.8	5.6	5.7	4.7	4.3	7.6	5.6	11.7	5.7
2000	5.2	4.5	6.2	4.3	4.6	5.8	4.2	11.7	5.2
2001	5.3	4.8	5.9	5.1	4.6	6.2	3.0	10.7	5.3
2002	4.6	5.0	5.8	4.3	5.1	6.2	3.4	11.3	5.0

(a) Part of New South Wales prior to 1911.

Source: ABS Cat. No. 3302.0.

Table S7: Perinatal mortality rates[(a)], by age group of mother, 1991 and 1998 to 2002 (per 1,000 live births plus foetal deaths)

	Age group of mother (years)						
Year	Less than 20	20–24	25–29	30–34	35–39	40 and over	Australia
1991	15.2	11.0	9.0	10.3	11.3	20.8	10.6
1998	13.0	8.9	7.4	6.9	9.6	12.6	8.3
1999	13.8	9.6	7.5	7.3	8.6	13.4	8.5
2000	14.3	9.4	7.4	7.1	8.4	9.2	8.3
2001	15.7	8.9	7.4	7.0	9.2	11.6	8.4
2002	12.4	9.0	7.3	6.5	7.9	12.7	8.0

(a) Perinatal deaths consist of foetal 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 foetal deaths combined.

Note: Data are based on year of registration and use the ABS definition for perinatal deaths of at least 400 grams birthweight or, where birthweight is unknown, at least 20 weeks gestation. Editions of *Australia's Health* prior to the year 2000 used the WHO definition of 500 grams birthweight and 22 weeks gestation.

Source: ABS Cat. No. 3303.0.

Table S8: Perinatal mortality rates[(a)], states and territories, 1991 and 1998 to 2002 (per 1,000 live births plus foetal deaths)

Year	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
1991	11.0	9.8	11.1	10.3	9.0	11.9	12.5	18.2	10.6
1998	8.1	7.7	9.6	7.5	7.2	9.8	12.2	13.1	8.3
1999	8.1	9.2	8.2	8.3	6.6	10.7	11.7	16.1	8.5
2000	7.7	7.9	8.9	8.4	8.2	10.6	8.3	14.5	8.3
2001	7.8	8.7	9.7	7.9	8.5	5.6	8.3	12.2	8.4
2002	7.2	8.3	8.8	7.1	8.3	12.9	5.6	10.4	8

(a) Perinatal deaths consist of foetal 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 foetal deaths combined.

Note: Data are based on year of registration and use the ABS definition for perinatal deaths of at least 400 grams birthweight or, where birthweight is unknown, at least 20 weeks gestation. Editions of *Australia's Health* prior to the year 2000 used the WHO definition of 500 grams birthweight and 22 weeks gestation.

Source: ABS Cat. No. 3303.0.

Table S9: Neonatal, postneonatal and infant mortality rates[(a)], selected countries (latest available year) (per 1,000 live births)

	Males			Females		
Country/year	Neonatal	Post-neonatal	Infant	Neonatal	Post-neonatal	Infant
Australia (2002)	**3.6**	**1.8**	**5.4**	**3.2**	**1.4**	**4.6**
Australia (2000)	***3.8***	***1.8***	***5.7***	***3.1***	***1.6***	***4.7***
Canada (1998)	3.9	1.8	5.7	3.5	1.4	4.8
Czech Republic (2000)	2.7	1.9	4.6	2.3	1.2	3.5
Denmark (1997)	4.3	1.2	5.5	3.9	1.2	5.0
Finland (2000)	2.6	1.5	4.1	2.1	0.9	3.1
France (1999)	3.0	1.8	4.8	2.5	1.3	3.8
Germany (1999)	3.1	1.9	5.0	2.6	1.5	4.0
Greece (1999)	4.8	1.8	6.6	4.0	1.7	5.7
Hungary (2000)	6.8	3.0	9.8	5.5	3.1	8.6
Ireland (1999)	4.2	2.0	6.2	3.9	1.6	5.6
Italy (1999)	4.1	1.5	5.7	3.4	1.3	4.7
Japan (1999)	1.9	1.7	3.7	1.7	1.4	3.1
Korea, Republic of (2000)	n.a.	n.a.	4.5	n.a.	n.a.	4.4
Netherlands (1998)	4.3	1.7	6.0	3.3	1.0	4.3
New Zealand (2000)	3.6	2.9	6.5	3.5	2.1	5.7
Norway (1999)	3.3	1.2	4.6	2.2	1.2	3.4
Poland (2000)	6.2	2.6	8.8	5.0	2.4	7.4
Portugal (2000)	3.9	2.2	6.0	2.9	2.1	5.0
Slovakia (2000)	6.1	3.8	9.9	4.6	2.6	7.2
Spain (1998)	3.2	2.0	5.2	2.7	1.7	4.4
Sweden (1999)	2.9	1.2	4.1	1.5	1.1	2.7
Switzerland (1998)	4.0	1.5	5.5	2.9	1.0	4.0
United Kingdom (1999)	4.3	2.1	6.4	3.4	1.6	5.1
United States (1999)	5.1	2.6	7.7	4.3	2.0	6.4

(a) Neonatal: less than 28 days. Postneonatal: 28 to 364 days. Infant: Less than 1 year.

Sources: WHO 2004; UN 2002; ABS 2003b.

Mortality

Table S10: Life expectancy (years) at selected ages, 1901 to 2000–2002

	At birth		At age 15		At age 65	
Year	**Males**	**Females**	**Males**	**Females**	**Males**	**Females**
Annual average						
1901–10	55.2	58.8	49.0	51.9	11.3	12.9
1920–22	59.2	63.3	51.4	54.6	12.0	13.6
1946–48	66.1	70.6	54.3	58.3	12.3	14.4
1960–62	67.9	74.2	55.1	61.0	12.5	15.7
1980–82	71.2	78.3	57.4	64.3	13.8	18.0
Annual rates						
1991	74.4	80.4	60.2	66.0	15.4	19.1
1994–1996[(a)]	75.2	81.1	60.9	66.7	15.8	19.6
1996–1998[(a)]	75.9	81.5	61.5	67.1	16.3	20.0
1998–2000[(a)]	76.6	82.0	62.2	67.6	16.8	20.4
2000–2002[(a)]	77.4	82.6	63.0	68.1	17.4	20.8

(a) The methodology used to calculate this table has changed since 1995. Data on population and deaths averaged over 3 years are now used to minimise year to year statistical variations.

Sources: ABS Cat. No. 3302.0; ABS unpublished data.

Table S11: Life expectancy (years) at selected ages, states and territories, 2000–2002

	At birth		At age 15		At age 65	
State/Territory	**Males**	**Females**	**Males**	**Females**	**Males**	**Females**
New South Wales	77.3	82.6	62.9	68.1	17.3	20.8
Victoria	77.8	82.8	63.4	68.3	17.5	20.9
Queensland	77.2	82.4	62.9	68.0	17.4	20.8
Western Australia	77.9	82.9	63.4	68.4	17.6	21.2
South Australia	77.3	82.6	62.9	68.1	17.3	20.9
Tasmania	76.5	81.3	62.2	66.9	16.7	20.0
Australian Capital Territory	79.2	83.3	64.7	68.7	18.2	21.0
Northern Territory	71.3	76.7	57.5	62.8	15.5	18.3
Australia	77.4	82.6	63.0	68.1	17.4	20.8

Sources: ABS Cat. No. 3302.0; ABS unpublished data.

Table S12: Life expectancy (years) at selected ages, selected countries, 2000

	At birth		At age 15–19		At age 65–69	
Country	**Males**	**Females**	**Males**	**Females**	**Males**	**Females**
Australia	76.6	82.1	62.2	67.6	16.7	20.2
Canada	76.0	81.5	61.5	66.9	15.9	19.8
Czech Republic	71.5	78.2	57.1	63.8	13.8	17.1
Denmark	74.2	78.5	59.9	64.0	15.3	17.8
Finland	73.7	80.9	59.2	66.4	15.1	19.2
France	75.2	83.1	60.9	68.7	17.2	21.6
Germany	74.3	80.6	59.8	66.1	15.1	18.9
Greece	75.4	80.8	61.0	66.3	15.9	18.6
Hungary	66.3	75.2	52.2	60.9	12.2	15.8
Ireland	74.1	79.7	59.6	65.1	14.3	18.1
Italy	76.0	82.4	61.6	68.0	16.5	20.6
Japan	77.6	84.7	63.1	70.1	17.5	22.4
Korea, Republic of	70.5	78.3	56.4	64.2	13.4	17.4
Netherlands	75.4	81.0	61.0	66.5	15.1	19.5
New Zealand	75.9	81.0	61.6	66.5	16.6	19.9
Norway	75.7	81.4	61.2	66.8	15.8	19.7
Poland	69.2	77.7	55.3	63.6	13.7	17.5
Portugal	71.7	79.3	57.7	65.0	14.3	18.0
Slovakia	69.2	77.5	55.2	63.3	13.0	16.9
Spain	75.4	82.3	60.9	67.9	16.2	20.2
Sweden	77.3	82.0	62.8	67.3	16.7	20.0
Switzerland	76.7	82.5	62.2	68.1	16.8	20.9
United Kingdom	74.8	79.9	60.5	65.4	15.1	18.5
United States	73.9	79.5	59.8	65.2	16.0	19.2

Source: WHO 2004.

Table S13: Age-specific, crude and age-standardised death rates, all causes by sex, selected years, 1921 to 2002 (per 100,000 population)

Sex/age group (years)	1921	1941	1961	1981	1991	2002
Males						
0–4	2,213	1,289	564	281	191	132
5–9	200	139	49	34	20	14
10–14	172	108	52	29	22	16
15–19	219	159	123	124	88	62
20–24	321	205	161	153	128	91
25–29	373	199	146	133	127	105
30–34	442	232	169	123	133	114
35–39	584	339	229	165	161	129
40–44	730	461	380	261	198	168
45–49	994	737	588	455	313	263
50–54	1,299	1,161	992	790	517	363
55–59	1,895	1,775	1,614	1,294	885	580
60–64	2,878	2,774	2,619	1,983	1,543	999
65–69	4,199	4,251	4,117	3,231	2,489	1,653
70–74	6,199	6,479	6,252	5,195	3,927	2,887
75–79	10,076	10,054	9,312	8,018	6,547	4,885
80–84	15,368	15,264	14,084	12,112	10,548	8,051
85+	26,213	29,453	23,772	20,814	17,571	16,441
Crude rate	**1,106**	**1,099**	**946**	**815**	**744**	**706**
ASR[(a)]	**1,987**	**1,853**	**1,600**	**1,318**	**1,056**	**821**
Females						
0–4	1,771	1,022	443	216	151	107
5–9	192	103	38	18	14	11
10–14	128	73	30	20	15	11
15–19	205	104	47	45	37	28
20–24	290	155	61	48	45	30
25–29	377	202	74	51	54	38
30–34	426	234	92	57	54	48
35–39	535	311	146	87	77	67
40–44	563	374	209	143	111	100
45–49	690	565	347	265	187	154
50–54	943	780	542	378	307	245
55–59	1,289	1,103	785	617	484	374
60–64	1,915	1,805	1,298	971	797	597
65–69	3,112	2,884	2,178	1,568	1,305	960
70–74	5,041	4,789	3,652	2,552	2,187	1,627
75–79	8,295	8,275	6,271	4,426	3,797	2,890
80–84	13,136	12,704	10,241	7,597	6,487	5,413
85+	22,345	25,457	20,670	16,035	14,351	13,389
Crude rate	**873**	**901**	**745**	**646**	**635**	**654**
ASR[(a)]	**1,602**	**1,452**	**1,058**	**772**	**658**	**543**

(a) Age–standardised the the total Australian population at 30 June 2001.

Source: AIHW Mortality Database.

Table S14: Age-specific, crude and age-standardised death rates, all causes by state and territory of usual residence, 2002 (per 100,000 population)

Sex/age group (years)	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Males									
0–4	121	138	148	101	125	171	106	298	132
5–9	13	16	13	17	12	29	9	0	14
10–14	15	18	15	15	10	23	9	35	16
15–19	55	58	73	63	68	75	55	131	62
20–24	88	78	112	94	86	76	36	203	91
25–29	96	96	113	120	95	141	54	339	105
30–34	114	94	123	122	122	116	63	320	114
35–39	134	115	137	94	143	144	91	350	129
40–44	176	152	172	157	172	177	140	366	168
45–49	283	249	259	239	222	249	194	693	263
50–54	378	325	359	357	394	401	298	685	363
55–59	586	559	601	474	656	746	286	1,057	580
60–64	1,010	944	1,103	921	930	1,070	708	1,630	999
65–69	1,680	1,621	1,661	1,545	1,688	1,872	1,083	2,670	1,653
70–74	2,911	2,972	2,748	2,844	2,783	3,475	1,898	3,682	2,887
75–79	4,864	4,820	4,970	4,643	4,963	5,916	4,291	5,505	4,885
80–84	8,247	8,019	7,774	7,949	8,050	8,026	7,478	9,825	8,051
85+	16,102	16,849	16,366	15,416	16,953	19,064	16,851	12,800	16,441
Crude rate	**726**	**714**	**682**	**601**	**811**	**873**	**416**	**542**	**706**
ASR[(a)]	**823**	**814**	**823**	**779**	**828**	**932**	**692**	**1,071**	**821**
Females									
0–4	99	98	118	106	113	107	69	327	107
5–9	12	12	12	9	6	0	19	24	11
10–14	9	11	12	15	10	18	9	26	11
15–19	26	21	31	27	33	18	25	139	28
20–24	24	23	35	41	25	42	29	146	30
25–29	31	36	44	45	36	36	24	105	38
30–34	45	43	48	55	44	74	38	219	48
35–39	62	62	61	75	79	112	40	236	67
40–44	93	97	100	97	116	134	101	266	100
45–49	139	148	161	154	177	208	123	367	154
50–54	246	232	251	225	276	283	171	406	245
55–59	392	357	365	351	372	468	241	661	374
60–64	631	556	574	588	582	774	494	871	597
65–69	994	927	948	876	962	1,111	926	1,720	960
70–74	1,641	1,599	1,695	1,579	1,497	1,830	1,356	2,857	1,627
75–79	2,841	2,867	2,983	2,923	2,720	3,554	2,834	5,057	2,890
80–84	5,334	5,437	5,556	5,035	5,401	6,096	6,525	4,481	5,413
85+	13,117	13,693	13,718	12,997	13,267	14,057	12,759	10,976	13,389
Crude rate	**671**	**672**	**611**	**567**	**766**	**810**	**437**	**369**	654
ASR[(a)]	**537**	**538**	**555**	**527**	**537**	**620**	**517**	**747**	543

(a) Age-standardised to the total Australian population at 30 June 2001.

Source: AIHW Mortality Database.

Table S15: Age-specific, crude and age-standardised death rates, selected countries, latest year (per 100,000 population)

	Age group (years)					
Country/year	**0[(a)]**	**1–4**	**5–14**	**15–24**	**25–34**	**35–44**
Males						
Australia (2002)	***543***	***31***	***15***	***77***	***109***	***149***
Australia (1999)	**627**	**31**	**15**	**99**	**137**	**162**
Canada (1998)	571	28	17	83	101	165
Czech Republic (2000)	463	28	22	87	111	252
Denmark (1998)	440	39	14	60	100	216
Finland (2000)	414	21	12	94	131	255
France (1999)	481	28	16	92	124	248
Germany (1999)	500	29	16	80	91	196
Greece (1999)	659	28	17	107	122	178
Hungary (2000)	979	45	22	79	157	559
Ireland (1999)	618	39	24	99	128	169
Italy (1999)	568	20	15	78	98	153
Japan (1999)	368	37	15	59	79	152
Korea, Republic of (2000)	452	49	27	75	116	277
Netherlands (1999)	547	33	16	58	73	142
New Zealand (1999)	709	36	21	111	135	165
Norway (1999)	459	37	12	91	103	154
Poland (2000)	882	35	22	96	156	395
Portugal (2000)	604	48	27	123	200	315
Slovakia (2000)	992	48	26	84	147	331
Spain (1998)	524	29	21	82	135	220
Sweden (1999)	409	13	16	53	75	144
Switzerland (1999)	534	30	16	77	98	143
United Kingdom (1999)	645	31	14	71	97	157
United States (1999)	772	38	22	116	150	257

(continued)

Table S15 (continued): Age-specific, crude and age-standardised death rates, selected countries, latest year (per 100,000 population)

	Age group (years)					
Country/year	**45–54**	**55–64**	**65–74**	**75+**	**Crude rate**	**ASR[(b)]**
Males						
Australia (2002)	***311***	***762***	***2,223***	***8,075***	***706***	***433***
Australia (1999)	**316**	**858**	**2,541**	**8,384**	**713**	**474**
Canada (1998)	361	1,003	2,799	9,176	754	511
Czech Republic (2000)	733	1,741	4,198	11,321	1,098	735
Denmark (1998)	507	1,271	3,492	10,853	1,097	616
Finland (2000)	590	1,189	3,037	10,177	952	595
France (1999)	570	1,190	2,767	9,091	965	558
Germany (1999)	489	1,218	3,109	10,148	976	577
Greece (1999)	448	1,087	2,719	9,337	1,044	538
Hungary (2000)	1,312	2,641	5,208	12,419	1,474	999
Ireland (1999)	435	1,211	3,679	12,216	912	651
Italy (1999)	365	1,015	2,786	9,542	1,022	515
Japan (1999)	399	945	2,391	8,546	870	465
Korea, Republic of (2000)	662	1,504	3,537	10,518	570	664
Netherlands (1999)	383	1,055	3,142	10,652	881	553
New Zealand (1999)	376	1,106	2,830	9,653	777	547
Norway (1999)	401	941	2,924	10,426	1,015	540
Poland (2000)	924	2,123	4,492	10,874	1,041	828
Portugal (2000)	568	1,239	3,228	11,448	1,124	663
Slovakia (2000)	944	2,229	4,993	11,709	1,072	874
Spain (1998)	472	1,135	2,797	9,743	988	556
Sweden (1999)	344	867	2,596	9,777	1,068	483
Switzerland (1999)	350	916	2,441	9,347	868	484
United Kingdom (1999)	407	1,125	3,228	10,250	1,025	567
United States (1999)	547	1,280	3,109	9,016	882	597

(continued)

Table S15 (continued): Age-specific, crude and age-standardised death rates, selected countries, latest year (per 100,000 population)

	Age group (years)					
Country/year	**0[(a)]**	**1–4**	**5–14**	**15–24**	**25–34**	**35–44**
Females						
Australia (2002)	***462***	***19***	***11***	***29***	***43***	***84***
Australia (1999)	**492**	**27**	**12**	**36**	**50**	**90**
Canada (1998)	484	23	13	31	41	95
Czech Republic (2000)	354	26	15	33	38	106
Denmark (1998)	445	26	11	22	42	129
Finland (2000)	306	15	14	34	51	109
France (1999)	379	22	13	33	49	115
Germany (1999)	405	22	11	30	40	101
Greece (1999)	568	26	13	30	43	82
Hungary (2000)	862	33	16	31	51	224
Ireland (1999)	555	33	14	34	41	96
Italy (1999)	471	18	12	25	36	78
Japan (1999)	312	29	11	25	39	78
Korea, Republic of (2000)	437	41	18	35	53	105
Netherlands (1999)	497	23	13	25	42	110
New Zealand (1999)	526	29	15	54	52	109
Norway (1999)	343	21	13	32	42	90
Poland (2000)	735	27	14	30	45	135
Portugal (2000)	500	37	18	38	53	126
Slovakia (2000)	717	30	17	30	39	120
Spain (1998)	444	26	14	28	45	89
Sweden (1999)	268	16	10	22	34	86
Switzerland (1999)	383	23	12	31	44	84
United Kingdom (1999)	507	24	11	29	44	101
United States (1999)	636	31	16	45	67	142

(continued)

Table S15 (continued): Age-specific, crude and age-standardised death rates, selected countries, latest year (per 100,000 population)

	Age group (years)					
Country/year	**45–54**	**55–64**	**65–74**	**75+**	**Crude rate**	**ASR[(b)]**
Females						
Australia (2002)	***198***	***472***	***1,279***	***6,566***	***655***	***291***
Australia (1999)	**197**	**497**	**1,379**	**6,643**	**640**	**304**
Canada (1998)	235	606	1,576	6,879	689	329
Czech Republic (2000)	317	733	2,202	9,183	1,026	425
Denmark (1998)	312	862	2,315	8,221	1,094	424
Finland (2000)	253	521	1,428	7,978	954	338
France (1999)	245	484	1,173	7,222	871	309
Germany (1999)	254	573	1,606	8,188	1,084	354
Greece (1999)	203	469	1,498	8,442	918	343
Hungary (2000)	512	1,045	2,631	9,809	1,242	535
Ireland (1999)	267	704	2,073	9,410	830	420
Italy (1999)	195	467	1,322	7,263	950	304
Japan (1999)	193	408	1,034	5,604	698	249
Korea, Republic of (2000)	219	553	1,741	7,964	460	359
Netherlands (1999)	279	614	1,641	8,098	896	364
New Zealand (1999)	258	708	1,789	7,587	730	375
Norway (1999)	241	565	1,557	7,918	1,007	343
Poland (2000)	357	830	2,165	8,832	869	441
Portugal (2000)	262	546	1,587	8,805	955	376
Slovakia (2000)	318	831	2,427	9,363	885	458
Spain (1998)	191	425	1,221	7,473	846	303
Sweden (1999)	223	532	1,434	7,788	1,078	323
Switzerland (1999)	206	455	1,187	7,498	876	304
United Kingdom (1999)	267	689	1,975	8,497	1,098	393
United States (1999)	313	786	1,973	7,774	872	407

(a) Infant mortality per 100,000 births.

(b) Age-standardised rate. Reference population is the WHO standard population. Standard death rates in this table are different from the rates in other tables because of the use of a diferent reference population.

Sources: WHO 2004; AIHW National Mortality Database.

Table S16: Age-standardised death rates[(a)], selected years, 1921 to 2002 (per 100,000 population)

	1921	1941	1961	1971	1981	1991	2000	2001	2002
Males									
Infectious and parasitic[(b)]	216	98	19	10	6	7	11	11	11
Neoplasms	178	206	227	256	282	277	252	250	246
Blood diseases	11	6	5	5	4	9	2	2	2
Endocrine, nutritional[(c)]	18	27	19	26	21	24	27	27	28
Mental disorders	8	4	5	10	11	16	18	14	16
Nervous system diseases	47	28	16	14	15	20	24	24	26
Circulatory diseases	452	764	914	924	689	469	318	304	297
Respiratory diseases	239	178	131	148	121	97	80	74	77
Digestive diseases	65	65	45	36	43	35	26	25	26
Skin diseases	6	3	2	1	1	1	1	1	1
Musculoskeletal diseases	8	5	4	5	4	4	4	4	4
Genitourinary diseases	148	167	54	29	20	18	17	17	18
Perinatal diseases	49	39	18	15	6	5	4	4	4
Congenital diseases	8	9	9	8	6	5	3	3	3
Ill-defined conditions	411	141	21	9	7	5	4	3	4
Injury and poisoning	123	112	109	110	84	67	61	59	57
All causes	**1,987**	**1,853**	**1,600**	**1,606**	**1,318**	**1,056**	**853**	**824**	**821**
Females									
Infectious and parasitic[(b)]	159	59	10	6	4	4	7	7	7
Neoplasms	180	188	161	160	157	167	151	152	153
Blood diseases	14	7	6	4	3	3	2	2	2
Endocrine, nutritional[(c)]	29	45	24	26	19	18	18	18	19
Mental disorders	4	3	3	7	7	12	15	13	15
Nervous system diseases	39	24	10	10	9	14	19	20	20
Circulatory diseases	404	640	640	635	440	317	223	213	209
Respiratory diseases	184	140	56	52	40	42	44	42	45
Digestive diseases	64	46	28	22	24	24	18	18	19
Skin diseases	6	3	2	1	—	1	1	1	2
Musculoskeletal diseases	10	8	5	6	5	6	5	5	6
Genitourinary diseases	75	90	23	20	14	13	13	13	13
Pregnancy	22	13	2	1	—	—	—	—	—
Perinatal diseases	36	30	14	12	5	4	3	3	3
Congenital diseases	6	8	8	7	5	4	3	3	3
Ill-defined conditions	332	102	20	7	5	3	3	2	3
Injury and poisoning	38	46	48	50	33	27	25	23	23
All causes	**1,602**	**1,452**	**1,058**	**1,026**	**772**	**658**	**552**	**535**	**543**

(a) Age-standardised the the total Australian population at 30 June 2001.

(b) From 1996, includes AIDS and AIDS-related deaths.

(c) Prior to 1996, includes AIDS and AIDS-related deaths.

Source: AIHW Mortality Database.

Table S17: Age-standardised death rates[(a)], by sex and ICD-10 chapter, states and territories, 2002 (per 100,000 population)

Sex/age group (years)	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Males									
Infectious and parasitic[(b)]	14	10	10	10	10	7	5	23	11
Neoplasms	238	253	248	248	240	304	215	264	246
Blood diseases	3	2	2	3	1	3	0	0	2
Endocrine, nutritional[(c)]	24	34	27	27	28	34	19	53	28
Mental disorders	17	17	15	14	13	14	19	46	16
Nervous system diseases	28	26	24	29	18	26	34	21	26
Circulatory diseases	305	288	298	264	309	332	267	297	297
Respiratory diseases	76	73	77	72	94	86	49	174	77
Digestive diseases	27	25	27	26	25	29	14	21	26
Skin diseases	2	1	1	1	2	1	4	0	1
Musculoskeletal diseases	4	4	4	4	3	6	7	0	4
Genitourinary diseases	18	19	14	18	20	13	7	19	18
Perinatal diseases	4	4	4	3	3	5	4	9	4
Congenital diseases	3	4	4	2	3	5	3	3	3
Ill-defined conditions	4	3	5	6	3	6	2	11	4
Injury and poisoning	56	51	64	54	54	64	42	131	57
All causes	823	814	823	779	828	932	692	1071	**821**
Females									
Infectious and parasitic[(b)]	8	6	6	7	8	7	5	16	7
Neoplasms	150	157	153	148	159	176	148	147	153
Blood diseases	2	2	2	2	2	2	3	2	2
Endocrine, nutritional[(c)]	16	23	20	21	18	19	15	76	19
Mental disorders	13	16	12	15	20	15	16	48	15
Nervous system diseases	21	20	19	28	14	24	21	19	20
Circulatory diseases	213	200	227	186	195	243	189	245	209
Respiratory diseases	45	44	43	44	53	50	56	54	45
Digestive diseases	18	19	18	20	19	22	14	21	19
Skin diseases	2	1	1	2	1	1	1	1	2
Musculoskeletal diseases	5	6	6	6	4	6	5	2	6
Genitourinary diseases	14	14	13	12	12	11	11	33	13
Pregnancy	—	—	—	—	—	—	—	—	—
Perinatal diseases	3	3	4	3	2	3	2	8	3
Congenital diseases	3	2	3	3	4	2	2	3	3
Ill-defined conditions	3	3	3	4	3	4	3	7	3
Injury and poisoning	21	22	25	26	22	34	24	64	23
All causes	537	538	555	527	537	620	517	747	**543**

(a) Age-standardised the the total Australian population at 30 June 2001.

(b) From 1996, includes AIDS and AIDS-related deaths.

(c) Prior to 1996, includes AIDS and AIDS-related deaths.

Source: AIHW Mortality Database.

Table S18: Age-standardised death rates[(a)], selected countries, latest year (per 100,000 population)

	ICD–10 cause					
	Malignant neoplasms	Diabetes mellitus	Circulatory	Bronchitis, emphysema and asthma	Accidents and adverse events	All causes
Males						
Australia (2002)	***133***	***11***	***136***	***20***	***27***	***433***
Australia (1999)	**141**	**10**	**158**	**23**	**33**	**474**
Canada (1998)	149	13	168	5	30	511
Czech Republic (2000)	214	8	332	15	49	735
Denmark (1998)	169	13	202	35	32	616
Finland (2000)	126	6	231	19	52	595
France (1999)	183	8	136	8	43	558
Germany (1999)	158	11	228	21	24	577
Greece (1999)	146	4	220	1	47	538
Hungary (2000)	264	12	418	30	55	999
Ireland (1999)	161	10	252	7	32	651
Italy (1999)	164	12	178	16	31	515
Japan (1999)	151	6	122	10	29	465
Korea, Republic of (2000)	183	27	144	24	60	664
Netherlands (1999)	172	10	183	30	19	553
New Zealand (1999)	156	15	204	12	33	547
Norway (1999)	143	8	200	21	31	540
Poland (2000)	204	9	339	21	54	828
Portugal (2000)	154	14	198	5	31	663
Slovakia (2000)	219	10	399	17	54	874
Spain (1998)	171	9	163	6	39	556
Sweden (1999)	122	9	201	13	21	483
Switzerland (1999)	137	10	159	20	n.a.	484
United Kingdom (1999)	152	6	213	6	19	567
United States (1999)	147	16	206	28	42	597

(continued)

Table S18 (continued): Age-standardised death rates[(a)], selected countries, latest year (per 100,000 population)

	ICD–10 cause					
	Malignant neoplasms	Diabetes mellitus	Circulatory	Bronchitis, emphysema and asthma	Accidents and adverse events	All causes
Females						
Australia (2002)	***91***	***7***	***94***	***11***	***11***	***291***
Australia (1999)	**92**	**7**	**106**	**12**	**14**	**304**
Canada (1998)	106	9	102	3	13	329
Czech Republic (2000)	119	6	212	5	19	425
Denmark (1998)	135	8	124	28	16	424
Finland (2000)	85	5	129	5	17	338
France (1999)	87	6	83	4	20	309
Germany (1999)	99	9	151	8	10	354
Greece (1999)	78	3	162	–	15	343
Hungary (2000)	137	11	254	11	21	535
Ireland (1999)	114	5	152	5	13	420
Italy (1999)	87	11	119	5	12	304
Japan (1999)	75	3	75	3	11	249
Korea, Republic of (2000)	73	18	97	10	21	359
Netherlands (1999)	110	9	111	12	9	364
New Zealand (1999)	118	10	130	9	17	375
Norway (1999)	99	5	119	13	14	343
Poland (2000)	109	8	202	6	16	441
Portugal (2000)	81	13	139	2	9	376
Slovakia (2000)	106	8	248	5	13	458
Spain (1998)	77	9	108	2	12	303
Sweden (1999)	93	6	124	9	9	323
Switzerland (1999)	81	8	107	7	n.a.	304
United Kingdom (1999)	112	4	132	3	9	393
United States (1999)	105	13	141	20	18	407

(a) Reference population is the WHO standard population. Standard death rates in this table are different from the rates in other tables because of the use of a different reference population.

Sources: WHO 2004; AIHW National Mortality Database.

Table S19: Age-standardised death rates[(a)], states and territories, by major causes of death, 2000–2002, and changes from 1997–1999 to 2000–2002

Cause of death	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Ischaemic heart disease								
Males	196.8	187.2	213.9	181.4	210.2	210.9	181.6	222.4
Per cent change 97–99 to 00–02	*–19.4%*	*–16.4%*	*–18.7%*	*–18.4%*	*–14.2%*	*–16.8%*	*–21.8%*	*–17.1%*
Females	114.7	106.0	132.8	104.0	115.8	126.7	113.4	139.8
Per cent change 97–99 to 00–02	*–19.0%*	*–18.2%*	*–12.9%*	*–14.8%*	*–14.7%*	*–8.7%*	*–8.9%*	*–7.3%*
Cerebrovascular disease (stroke)								
Males	79.4	67.9	75.0	64.8	70.8	83.7	64.2	69.3
Per cent change 97–99 to 00–02	*–9.3%*	*–10.8%*	*–10.4%*	*–18.9%*	*–13.2%*	*–13.1%*	*–25.4%*	*–26.3%*
Females	72.4	62.1	73.7	58.1	66.9	74.2	79.8	60.1
Per cent change 97–99 to 00–02	*–11.2%*	*–12.8%*	*–5.5%*	*–19.8%*	*–9.0%*	*–5.5%*	*–13.3%*	*–38.8%*
Lung cancer								
Males	58.5	58.7	64.2	65.1	59.0	69.3	43.9	80.9
Per cent change 97–99 to 00–02	*–8.3%*	*–8.6%*	*–7.6%*	*–3.0%*	*–9.2%*	*–1.1%*	*–28.9%*	11.6%
Females	24.9	26.2	25.5	26.4	23.7	35.0	25.3	37.9
Per cent change 97–99 to 00–02	7.0%	7.9%	6.2%	3.3%	11.2%	43.3%	*–18.4%*	*–4.7%*
Chronic obstructive pulmonary disease								
Males	44.5	48.1	49.9	39.1	43.7	63.4	40.1	98.2
Per cent change 97–99 to 00–02	*–19.0%*	*–12.5%*	*–11.2%*	*–22.9%*	*–4.1%*	*–12.8%*	*–20.8%*	2.7%
Females	21.8	21.4	20.3	18.5	18.4	32.4	26.6	49.4
Per cent change 97–99 to 00–02	*–9.5%*	*–8.5%*	*–8.3%*	*–7.1%*	*–5.7%*	*–5.5%*	4.0%	*–25.1%*
Colorectal cancer								
Males	31.2	34.8	33.4	35.1	34.7	35.4	33.7	17.7
Per cent change 97–99 to 00–02	*–11.0%*	*–6.6%*	*–7.4%*	*–8.6%*	2.0%	*–6.9%*	*–6.5%*	*–19.3%*
Females	20.6	23.2	23.0	21.9	22.3	31.4	24.7	15.7
Per cent change 97–99 to 00–02	*–6.0%*	*–8.4%*	*–3.6%*	*–8.0%*	*–9.7%*	1.8%	*–21.5%*	*–36.3%*
All causes								
Males	928.4	916.9	950.6	896.8	958.0	1040.4	910.1	1258.7
Per cent change 97–99 to 00–02	*–9.9%*	*–8.4%*	*–8.7%*	*–10.6%*	*–6.1%*	*–6.3%*	*–11.3%*	*–5.7%*
Females	603.5	603.6	620.4	581.7	617.2	691.1	661.9	871.8
Per cent change 97–99 to 00–02	*–7.7%*	*–7.4%*	*–6.1%*	*–7.7%*	*–4.1%*	*–3.7%*	*–9.0%*	*–15.3%*

(a) Age-standardised the the total Australian population at 30 June 2001.

Source: AIHW National Mortality Database.

Infectious diseases

Table S20: Selected notifiable diseases, 1999 to 2002

	Notifications				Rate per 100,000 population			
Disease	**1999**	**2000**	**2001**	**2002**	**1999**	**2000**	**2001**	**2002**
Bloodborne diseases								
Hepatitis B (incident)	303	398	424	390	1.6	2.1	2.2	2.0
Hepatitis B (unspecified)[(a)]	7,164	7,908	8,424	6,916	38.1	41.6	43.7	35.5
Hepatitis C (incident)	396	391	600	434	2.6	2.5	3.8	2.8
Hepatitis C (unspecified)[(a) (b)]	18,653	19,647	19,586	15,981	98.3	102.2	100.5	81.3
Hepatitis D	19	27	21	20	0.1	0.2	0.1	0.1
Hepatitis (nec)	0	1	2	0	<0.1	<0.1	<0.1	0.0
Gastrointestinal diseases								
Botulism	0	2	2	0	0.0	<0.1	<0.1	0.0
Campylobacteriosis[(c)]	12,657	13,602	16,124	14,605	100.9	107.1	125.2	112.2
Cryptosporidiosis	—	—	1,615	3,255	—	—	8.3	16.6
Haemolytic uraemic syndrome	23	16	3	13	0.1	0.1	0.0	0.1
Hepatitis A	1,554	813	530	388	8.2	4.2	2.7	2.0
Hepatitis E	9	10	10	12	0.1	0.1	0.1	0.1
Listeriosis	64	66	62	59	0.3	0.3	0.3	0.3
Salmonellosis (nec)	7,147	6,227	7,045	7,756	37.6	32.4	36.2	39.4
Shigellosis	547	496	562	496	4.4	3.9	2.9	2.5
SLTEC, VTEC[(d)]	52	38	49	51	0.4	0.3	0.3	0.3
Typhoid	68	60	84	73	0.4	0.3	0.4	0.4
Quarantinable diseases								
Cholera	3	1	4	2	<0.1	<0.1	<0.1	<0.1
Plague	0	0	0	0	0.0	0.0	0.0	0.0
Rabies	0	0	0	0	0.0	0.0	0.0	0.0
Viral haemorrhagic fever	0	0	0	0	0.0	0.0	0.0	0.0
Yellow fever	0	0	0	0	0.0	0.0	0.0	0.0
Sexually transmissable diseases								
Chlamydial infection (nec)	14,046	17,018	20,026	24,039	74.0	88.5	102.8	122.3
Donovanosis	18	21	33	16	0.1	0.1	0.2	0.1
Gonococcal infection[(e)]	5,644	5,801	6,158	6,247	29.7	30.2	31.6	31.8
Syphilis[(f)]	1,849	1,791	1,421	1,627	9.7	9.3	7.3	8.3
Vaccine preventable diseases								
Diphtheria	0	0	1	0	0.0	0.0	<0.1	0.0
Haemophilus influenzae type b	40	28	26	29	0.2	0.1	0.1	0.1
Invasive pneumococcal disease	—	—	1,681	2,271	—	—	8.6	11.5
Laboratory-confirmed influenza	—	—	1,286	3,665	—	—	7	18.6
Measles	238	107	141	31	1.3	0.6	0.7	0.2

(continued)

Table S20 (continued): Selected notifiable diseases, 1999 to 2002

	Notifications				Rate per 100,000 population			
Disease	**1999**	**2000**	**2001**	**2002**	**1999**	**2000**	**2001**	**2002**
Vaccine preventable diseases *(continued)*								
Mumps	184	214	114	69	1.2	1.4	0.6	0.4
Pertussis	4,417	5,964	9,515	5,388	23.3	31.0	48.8	27.4
Poliomyelitis	0	0	0	0	0.0	0.0	0.0	0.0
Rubella[(g)]	377	323	263	255	2.0	1.7	1.3	1.3
Tetanus	2	6	3	3	0.0	0.0	0.0	0.0
Vectorborne diseases								
Arbovirus infection (nec)	62	55	36	22	0.3	0.3	0.2	0.1
Barmah Forest virus infection	638	644	1,141	896	3.4	3.3	5.9	4.6
Dengue	132	216	176	219	0.7	1.1	0.9	1.1
Japanese encephalitis	—	—	0	0	—	—	—	0.0
Kunjin virus infection	—	—	4	0	—	—	<0.1	0.0
Malaria	732	962	712	466	3.9	5.0	3.7	2.4
Murray Valley encephalitis	—	—	6	2	—	—	<0.1	0.0
Ross River virus infection	4,417	4,225	3,219	1,447	23.3	22.0	16.5	7.4
Zoonoses								
Anthrax	—	—	0	0	—	—	0.0	0.0
Australian bat lyssavirus	—	—	0	0	—	—	0.0	0.0
Brucellosis	52	27	19	40	0.3	0.1	0.1	0.2
Leptospirosis	323	245	245	155	1.7	1.3	1.3	0.8
Ornithosis	84	103	131	199	0.9	1.1	0.7	1.0
Lyssavirus (nec)	—	—	0	0	—	—	0.0	0.0
Q fever	515	579	696	761	2.7	3.0	3.6	3.9
Other bacterial infections								
Invasive memingococcal infection	590	622	677	684	3.1	3.2	3.5	3.5
Legionellosis	249	474	307	318	1.3	2.5	1.6	1.6
Leprosy	6	4	5	3	<0.1	<0.1	<0.1	0.0
Tuberculosis	1,146	1,052	989	975	6.0	5.5	5.1	5.0
Total	**84,420**	**90,184**	**104,187**	**100,278**				

nec Not elsewhere classified.

— Elsewhere classified.

(a) Unspecified hepatitis includes cases with hepatitis in whom the duration of illness cannot be determined.

(b) Includes incident hepatitis C in the Northern Territory and Queensland.

(c) Notified as 'foodborne disease' or 'gastroenteritis in an institution' in New South Wales.

(d) Infections with Shiga-like toxin (verotoxin) producing *E. coli*. (SLTEC/VTEC).

(e) Northern Territory, Queensland, South Australia, Victoria and Western Australia include gonococcal neonatal ophthalmia.

(f) Includes congenital syphlis.

(g) Includes congenital rubella.

Source: Yohannes K, Roche P, Blumer C et al. 2004.

Table S21: Characteristics of AIDS cases by year of diagnosis[(a)]

Characteristic	≤1993	1994	1994	1996	1997	1998	1999	2000	2001	2002
Total cases	5,061	953	810	669	382	318	193	248	189	195
Per cent males	96.1	94.9	95.3	95.1	91.9	93.1	88.6	80.7	88.9	92.8
Median age (years)										
Males	37	37	37	37	37	39	39	39	40	41
Females	33	37	31	35	34	32	35	34	34	36
State/Territory (per cent)										
NSW	59.2	57.8	58.4	54.7	51.8	53.8	57.0	48.0	41.8	38.0
Vic	20.7	20.0	20.0	20.8	20.9	20.1	17.6	24.6	25.9	23.1
Qld	9.2	10.3	12.5	11.5	15.7	12.0	16.6	16.1	15.3	22.0
WA	4.7	4.3	3.7	5.7	3.9	4.7	2.6	6.0	10.6	6.7
SA	4.1	5.2	3.7	4.8	6.3	6.0	5.2	3.2	5.3	7.7
Tas	0.6	0.5	0.2	1.1	0.5	0.9	0.0	0.4	0.5	1.0
ACT	1.1	1.5	1.1	1.3	0.0	1.6	0.0	1.2	0.0	1.0
NT	0.4	0.3	0.4	0.1	0.8	0.9	1.0	0.4	0.5	0.5
HIV exposure category (per cent)[(b)]										
Male homosexual contact	85.2	83.4	81.0	80.3	75.4	67.9	65.1	67.5	70.0	71.4
Male homosexual contact and injecting drug use	4.2	5.0	5.8	5.8	3.9	3.0	5.7	5.6	2.8	5.5
Injecting drug use[(c)]	2.4	3.1	3.6	3.6	5.0	8.1	5.7	6.5	4.0	3.8
Heterosexual contact	3.7	5.7	6.4	8.2	14.1	18.6	22.3	18.2	20.9	17.6
Haemophilia/coagulation disorder	1.7	1.1	1.9	1.1	1.1	0.3	0.6	1.3	0.6	1.1
Receipt of blood/tissue	2.6	1.0	0.8	0.9	0.3	1.4	0.6	0.4	0.6	0.5
Mother with/at risk for HIV infection	0.2	0.7	0.5	0.0	0.3	0.7	0.0	0.4	1.1	0.0
Other/undetermined	2.7	3.3	4.1	5.1	5.2	6.9	9.3	6.9	6.3	6.7
AIDS defining condition (per cent)										
Pneumocystis carinii pneumonia (PCP)	31.3	22.5	19.9	22.4	25.1	22.0	19.7	28.6	28.0	32.3
Kaposi's sarcoma (KS)	13.0	10.0	10.9	11.8	8.9	9.7	7.8	6.9	10.1	4.6
PCP and other (not KS)	6.2	2.4	4.2	4.3	7.1	6.9	8.8	7.3	9.0	9.2
Oesophageal candidiasis	7.5	14.2	16.3	14.6	10.2	10.1	12.4	11.7	5.8	11.3
Mycobacterium avium	4.4	5.0	7.1	6.6	3.7	4.4	3.1	4.4	2.6	0.5
HIV wasting disease	3.8	7.3	8.3	5.1	6.8	10.4	13.0	6.4	4.2	4.6
Other conditions	33.8	38.6	33.3	35.1	38.2	36.5	35.2	34.7	40.2	37.4

(a) Not adjusted for reporting delay.

(b) The 'Other/undetermined' category was excluded from the percentage of cases attributed to each HIV exposure category.

(c) Excludes males who also reported a history of homosexual contact.

Source: NCHECR 2003.

Cancer

Table S22: Leading cancers[(a)], 2000

	New cases				Deaths			
Cancer	**Number**	**Per cent**	**ASR[(b)]**	**Lifetime risk[(c)]**	**Number**	**Per cent**	**ASR[(b)]**	**PYLL[(d)]**
Males								
Prostate	10,512	22.9	124.9	1 in 11	2,665	13.3	35.9	5,783
Colorectal	6,863	14.9	80.2	1 in 17	2,569	12.8	31.0	18,135
Lung	5,278	11.5	62.1	1 in 22	4,594	22.9	54.8	28,078
Melanoma	4,770	10.4	53.7	1 in 25	617	3.1	7.3	6,150
Bladder	2,139	4.7	26.1	1 in 61	570	2.8	7.6	1,735
NHL[(e)]	1,864	4.1	21.5	1 in 66	857	4.3	10.4	7,138
Unknown primary	1,607	3.5	19.5	1 in 83	1,202	6.0	15.1	6,708
Kidney	1,470	3.2	16.8	1 in 76	500	2.5	6.0	4,083
Stomach	1,267	2.8	15.1	1 in 99	763	3.8	9.3	5,040
Pancreas	912	2.0	10.9	1 in 136	872	4.4	10.4	6,283
All cancers	**45,935**	**100.0**	**535.7**	**1 in 3**	**20,038**	**100.0**	**245.0**	**136,660**
Females								
Breast	11,314	28.8	115.3	1 in 11	2,521	16.3	24.7	28,305
Colorectal	5,542	14.1	53.8	1 in 26	2,149	13.9	20.2	12,090
Melanoma	3,761	9.6	38.0	1 in 35	354	2.3	3.5	4,403
Lung	2,782	7.1	27.4	1 in 45	2,317	15.0	22.5	15,468
NHL[(e)]	1,593	4.1	15.6	1 in 88	734	4.8	7.0	4,598
Uterus	1,564	4.0	15.8	1 in 75	261	1.7	2.5	1,458
Unknown primary	1,558	4.0	14.6	1 in 116	1,217	7.9	11.2	5,803
Ovary	1,201	3.1	12.0	1 in 108	780	5.1	7.6	6,485
Kidney	935	2.4	9.2	1 in 143	334	2.2	3.2	1,803
Pancreas	896	2.3	8.4	1 in 195	876	5.7	8.2	3,720
All cancers	**39,296**	**100.0**	**390.4**	**1 in 4**	**15,428**	**100.0**	**147.5**	**116,425**

(a) Rankings are based on the number of new cases, excludes non-melanocytic skin cancers.

(b) Age-standardised rate per 100,000 population. Age-standardised to the Australian population at 30 June 2001.

(c) Lifetime risk—a measure which approximates the risk of contracting a particular cancer in a lifetime if the risks at the year of estimation remained throughout a persons' life. For the purposes of this table, 'lifetime' is defined as ages 0–74.

(d) Potential years of life lost between the ages of 0 and 74 years.

(e) Non-Hodgkin's lymphoma.

Sources: AIHW & AACR 2003; AIHW National Mortality Database.

Table S23: Major cancers, age-standardised incidence rates[(a)], 1992 to 2000 (per 100,000 population)

Cancer	1992	1993	1994	1995	1996	1997	1998	1999	2000
Males									
Prostate	124.3	164.4	183.7	167.8	136.4	128.5	126.5	126.7	124.9
Colorectal	75.9	75.7	77.0	78.2	79.5	78.2	76.0	76.2	80.2
Lung	73.4	71.3	74.1	69.8	69.6	69.0	67.1	65.0	62.1
Melanoma	46.8	48.2	48.4	51.2	53.2	55.3	51.6	53.4	53.7
Bladder	25.8	26.0	28.2	27.8	25.8	26.1	26.5	25.8	26.1
NHL[(b)]	20.8	20.8	19.6	19.4	21.5	21.2	20.7	21.2	21.5
Kidney[(c)]	14.7	14.7	14.9	15.8	15.6	15.3	16.3	17.3	16.8
Stomach	17.7	17.9	17.3	17.7	15.7	15.6	15.6	16.0	15.1
Pancreas	11.3	11.1	11.9	11.0	11.1	10.9	11.2	11.4	10.9
Testis	5.5	5.2	5.8	5.6	5.8	6.0	6.0	6.0	6.0
All cancers	**546.3**	**580.3**	**608.3**	**587.3**	**561.2**	**551.0**	**541.9**	**539.7**	**535.7**
Females									
Breast	98.0	105.3	113.9	115.7	109.2	111.2	114.8	110.7	115.3
Colorectal	54.8	53.1	54.6	53.6	53.3	53.6	53.1	55.1	53.8
Melanoma	35.0	35.0	35.3	36.7	37.8	39.9	36.7	37.4	38.0
Lung	23.8	25.5	25.6	25.9	26.3	26.7	26.1	26.0	27.4
Uterus[(d)]	14.9	14.7	15.6	15.4	14.6	14.9	14.8	14.7	15.8
NHL[(b)]	14.2	13.7	14.4	15.1	15.1	15.5	15.1	15.1	15.6
Kidney[(c)]	9.1	8.3	8.2	8.4	8.7	8.8	8.9	9.3	9.2
Pancreas	8.6	8.6	8.2	8.6	8.6	8.8	9.1	8.6	8.4
Cervix	12.2	11.9	12.9	10.7	10.3	8.6	9.0	8.2	7.6
Bladder	6.1	6.9	7.1	6.8	6.5	7.0	7.3	7.1	7.1
Stomach	7.4	7.1	7.0	7.4	7.0	7.6	6.7	6.4	6.9
All cancers	**370.3**	**374.9**	**387.2**	**393.3**	**385.0**	**388.8**	**390.5**	**385.8**	**390.4**

(a) Age-standardised to the Australian population at 30 June 2001.

(b) Non-Hodgkin's lymphoma.

(c) Includes ICD–10 codes C64–C66, C68.

(d) Includes ICD–10 codes C54–C55.

Source: AIHW & AACR 2003.

Table S24: Major cancers, average annual age-standardised incidence rates[(a)], states and territories 1996–2000 and Australia 2000 (per 100,000 population)

Cancer	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust[(b)]
Males									
Prostate	129.2	130.3	117.7	116.4	146.2	133.5	172.4	102.6	124.9
Colorectal	76.9	79.9	78.9	76.8	79.1	74.6	75.5	54.7	80.2
Lung	64.6	65.5	70.3	68.6	67.0	71.3	45.6	76.9	62.1
Melanoma	54.3	40.7	74.0	56.3	44.7	41.8	49.0	37.5	53.7
Bladder	21.2	34.4	33.5	16.3	18.9	21.9	22.6	14.8	26.1
NHL[(c)]	21.0	23.0	19.8	19.2	22.4	21.7	25.1	10.4	21.5
Kidney[(d)]	16.0	16.3	17.8	13.6	17.1	17.0	15.3	12.8	16.8
Stomach	15.1	17.0	15.3	14.8	15.8	14.9	13.8	12.5	15.1
Pancreas	10.7	11.7	11.3	10.6	11.4	10.2	10.8	9.8	10.9
Testis	6.0	6.0	5.5	5.7	6.5	5.8	8.0	4.5	6.0
All cancers	**536.8**	**543.9**	**574.3**	**518.2**	**556.0**	**533.5**	**559.0**	**480.0**	**535.7**
Females									
Breast	110.9	114.5	113.6	111.5	115.4	101.2	118.0	93.1	115.3
Colorectal	51.9	54.7	56.7	49.4	56.6	58.7	52.2	42.4	53.8
Melanoma	34.8	33.8	51.5	37.9	35.2	40.6	32.0	27.0	38.0
Lung	25.7	27.4	26.0	28.9	24.4	29.7	27.1	42.3	27.4
Uterus[(e)]	13.6	16.8	15.4	12.6	17.2	12.7	16.3	16.4	15.8
NHL[(c)]	15.1	16.0	14.4	13.1	17.6	17.5	16.7	9.7	15.6
Kidney[(d)]	9.3	8.7	9.9	7.8	8.0	9.0	10.0	6.5	9.2
Pancreas	8.6	8.7	8.4	9.2	8.1	10.8	9.1	12.9	8.4
Cervix	9.1	7.9	10.0	8.5	6.8	9.5	7.3	15.9	7.6
Bladder	6.1	8.7	9.5	4.2	4.9	5.4	4.1	1.3	7.1
Stomach	6.6	7.5	6.6	7.0	6.9	6.9	8.0	3.8	6.9
All cancers	**377.9**	**393.2**	**411.4**	**367.2**	**390.1**	**394.3**	**381.1**	**367.1**	**390.4**

(a) Age-standardised to the Australian population at 30 June 2001.

(b) State and Territory averages for 1996–2000 do not equate to a single-year average for Australia.

(c) Non-Hodgkin's lymphoma.

(d) Includes ICD–10 codes C64–C66, C68.

(e) Includes ICD–10 codes C54–C55.

Source: AIHW & AACR 2003.

Table S25: Major cancers, age-standardised incidence rates[(a)], selected countries 1993–1997 and Australia 1993 and 2000 (per 100,000 population)

Males	Colorectal	Lung	Melanoma	Prostate	Stomach	All cancers[(b)]
Australia 1993	***47.6***	***44.2***	***33.9***	***90.5***	***10.4***	***361.7***
Australia 2000	**49.6**	**37.1**	**37.2**	**74.2**	**8.9**	**338.2**
Canada	41.8	59.1	8.5	80.2	9.2	330.2
UK, England	35.5	51.2	5.8	39.6	13.1	266.6
Italy, Venetian region[(c)]	39.9	72.5	8.8	37.0	16.5	363.3
Japan, Osaka Prefecture	35.8	44.6	0.4	9.0	59.9	272.4
The Netherlands	38.1	64.7	8.0	53.9	13.1	312.4
New Zealand	52.0	42.2	32.8	85.5	9.8	345.9
USA, SEER[(d)], black	44.2	85.9	1.0	185.4	13.4	485.5
USA, SEER[(d)], white	38.1	54.4	15.4	107.8	6.6	364.5
Females	**Colorectal**	**Lung**	**Melanoma**	**Breast**	**Stomach**	**All cancers[(b)]**
Australia 1993	***33.2***	***16.6***	***26.6***	***76.2***	***4.2***	***258.2***
Australia 2000	**33.6**	**17.6**	**28.3**	**84.4**	**4.1**	**268.6**
Canada	28.8	30.8	7.5	78.5	4.0	258.7
UK, England	22.8	22.0	7.4	74.4	4.9	226.0
Italy, Venetian region[(c)]	24.8	12.6	9.4	74.7	8.1	236.9
Japan, Osaka Prefecture	20.9	13.3	0.3	27.9	23.8	154.6
The Netherlands	28.0	16.3	10.9	85.6	5.2	240.9
New Zealand	40.6	21.5	30.6	75.8	4.4	275.9
USA, SEER[(d)], black	34.3	36.8	0.5	83.1	5.3	273.5
USA, SEER[(d)], white	27.6	34.6	11.6	92.1	2.6	284.6

(a) Age-standardised to the World Standard Population.

(b) Excludes non-melanocytic skin cancer.

(c) Includes data for 1993–1996.

(d) SEER—Surveillance, Epidemiology and End Results Program.

Source: Parkin et al. 2002.

Oral health

Table S26: Primary teeth with caries experience[(a)], 5- to 10-year-old children, 1989 to 1999 (mean number of teeth)

	Age (years)					
	5	6	7	8	9	10
1989	2.07	2.15	2.38	2.31	2.26	1.88
1990	1.85	2.06	2.20	2.31	2.28	1.78
1991	1.78	1.94	2.13	2.24	2.22	1.81
1992	1.80	1.95	1.93	2.21	2.11	1.74
1993	1.76	1.90	2.01	2.15	2.13	1.73
1994	1.56	1.79	1.95	2.13	2.01	1.71
1995	1.49	1.73	1.87	2.05	1.97	1.61
1996	1.26	1.45	1.66	1.68	1.72	1.47
1997	1.28	1.50	1.63	1.78	1.75	1.47
1998	1.37	1.51	1.62	1.81	1.70	1.40
1999	1.55	1.51	1.69	1.81	1.69	1.31

(a) As measured by dmft index (number of decayed, missing due to caries and filled primary teeth).

Source: AIHW DSRU: Armfield J, Roberts-Thomson K & Spencer J 2003.

Table S27: Permanent teeth with caries experience[(a)], 7- to 14-year-old children, 1989 to 1999 (mean number of teeth)

	Age (years)							
	7	8	9	10	11	12	13	14
1989	0.26	0.46	0.65	0.83	1.37	1.56	2.43	2.63
1990	0.24	0.42	0.63	0.76	1.00	1.44	2.14	2.45
1991	0.24	0.40	0.56	0.83	0.91	1.29	1.83	2.67
1992	0.21	0.38	0.53	0.69	0.90	1.22	n.a.	n.a.
1993	0.22	0.36	0.51	0.66	0.90	1.10	1.61	1.94
1994	0.23	0.37	0.47	0.65	0.88	1.09	1.54	2.00
1995	0.20	0.36	0.46	0.57	0.79	1.01	1.66	1.69
1996	0.18	0.30	0.38	0.49	0.66	0.90	1.35	1.30
1997	0.17	0.30	0.42	0.52	0.65	0.86	1.15	1.60
1998	0.21	0.32	0.41	0.58	0.64	0.83	1.13	1.29
1999	0.20	0.30	0.42	0.53	0.69	0.83	1.28	1.33

(a) As measured by DMFT index (number of decayed, missing due to caries and filled permanent teeth).

Source: AIHW DSRU: Armfield J, Roberts-Thomson K & Spencer S 2003.

Table S28: Dental caries experience[(a)] of 6-year-old and 12-year-old children, states and territories, 1989 to 1999 (mean number of teeth)

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
6-year-old (dmft)									
1989	2.21	2.16	2.34	1.62	2.21	1.70	1.17	2.04	2.15
1990	2.20	2.10	2.43	1.54	1.88	1.59	1.15	2.08	2.06
1991	2.05	2.04	2.48	1.29	1.98	1.57	1.14	1.96	1.94
1992	2.00	2.05	2.37	1.32	1.53	1.48	1.09	1.99	1.95
1993	2.04	1.81	2.18	1.48	1.38	1.35	1.33	1.81	1.90
1994	1.93	1.67	2.27	1.37	1.17	n.a.	1.17	1.99	1.79
1995	1.75	1.78	1.99	1.39	1.47	1.48	1.39	1.99	1.73
1996	0.94	1.61	2.25	1.30	1.17	1.37	0.89	1.79	1.45
1997	0.97	1.92	1.97	1.45	1.39	1.45	1.05	1.81	1.50
1998	0.90	2.08	2.04	1.43	1.24	1.40	1.40	2.00	1.51
1999	0.99	1.93	2.24	1.45	1.50	1.58	1.19	2.14	1.51
12-year-old (DMFT)									
1989	1.32	1.54	1.65	2.04	1.52	1.06	1.14	1.08	1.56
1990	1.32	n.a.	1.69	1.75	1.26	1.11	1.03	1.18	1.44
1991	1.18	1.38	1.54	1.43	1.06	1.18	0.91	1.26	1.29
1992	1.19	1.77	1.50	1.22	1.04	0.98	0.76	0.91	1.22
1993	1.04	1.52	1.44	1.20	0.64	0.96	0.77	0.85	1.10
1994	1.11	1.28	1.37	1.07	0.59	n.a.	0.69	0.81	1.09
1995	0.93	1.02	1.37	1.04	0.64	0.86	0.61	0.82	1.01
1996	0.64	1.09	1.30	0.99	0.47	0.96	0.56	0.71	0.90
1997	0.64	1.04	1.14	0.87	0.58	0.97	0.82	0.78	0.86
1998	0.49	1.15	1.22	0.77	0.52	1.39	0.68	0.79	0.83
1999	0.55	1.11	1.30	0.75	0.58	1.15	0.74	0.86	0.83

(a) As measured by dmft or DMFT index (number of decayed, missing and filled primary or permanent teeth).

Source: AIHW Dental Statistics and Research Unit unpublished data.

Cardiovascular risk factors

Table S29: Prevalence of cardiovascular disease risk factors by age, 1999 to 2001 (per cent)

		Age group				
Risk factor	**Sex**	**25–34**	**35–54**	**55–74**	**75+**	**ASR[(g)]**
Diabetes[(a)]	Male	0.1	4.5	18.4	23.6	8.7
	Female	0.4	3.8	12.5	22.7	6.7
High blood cholesterol[(b)]	Male	32.2	58.0	58.3	49.3	51.5
	Female	31.2	46.5	72.5	65.4	51.0
High blood pressure[(c)]	Male	7.1	21.6	58.5	78.8	32.3
	Female	3.4	14.9	55.8	74.6	27.2
Overweight[(d)]	Male	61.1	68.1	74.1	63.6	67.4
	Female	35.0	51.5	67.8	52.0	51.9
Smoking[(e)]	Male	29.0	24.4	13.6	4.8	21.1
	Female	23.8	20.8	10.4	4.4	17.5
Insufficient activity[(f)]	Male	56.0	57.7	58.7	n.a.	57.6[(h)]
	Female	51.0	58.8	56.6	n.a.	56.3[(h)]

n.a. Not available.

(a) Diabetes includes type 1 and type 2.

(b) High blood cholesterol is defined as above 5.5 mmol/L.

(c) High blood pressure is defined as systolic blood pressure ≥ 140mmHg and/or diastolic blood pressure ≥ 90 mmHg and/or receiving treatment for high blood pressure.

(d) Overweight is defined as body mass index (BMI) ≥ 25.

(e) The daily smoking of tobacco products, including packet cigarettes, roll-your-own cigarettes, pipes and cigars.

(f) Insufficient activity is less than 150 minutes of activity per week or more than 150 minutes accrued over less than five sessions of actviity per week.

(g) Age standardised to the Australian population at 30 June 2001.

(h) Data for ages 25–74.

Sources: AIHW analysis of the 1999–2000 AusDiab Study; AIHW analysis of the 2000 National Physical Activity Survey; 2001 National Drug Strategy Household Survey.

Use of hospitals

Table S30: Separations from public hospitals, by age group and sex, states and territories, 2001–02

Age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Males									
Under 1	23,683	17,895	10,777	4,756	5,681	1,416	913	1,597	66,718
1–4	29,945	19,246	16,547	7,963	7,987	1,421	1,121	1,601	85,831
5–14	36,977	23,935	20,720	9,603	8,640	1,712	1,446	1,512	104,545
15–24	38,302	30,263	25,982	11,131	10,422	2,565	1,660	1,935	122,260
25–34	47,700	42,984	32,701	16,140	14,889	3,514	3,181	3,600	164,709
35–44	58,068	51,519	36,341	18,812	17,080	3,566	3,095	4,342	192,823
45–54	65,063	62,565	41,501	21,760	21,725	4,850	4,675	6,300	228,439
55–64	77,909	77,276	50,706	22,668	23,695	5,741	6,220	4,079	268,294
65–74	105,115	106,300	53,982	29,546	29,010	7,406	5,588	2,792	339,739
75+	111,913	92,538	44,360	24,711	33,754	6,004	3,680	936	317,896
Total	**594,715**	**524,521**	**333,617**	**167,090**	**172,883**	**38,195**	**31,579**	**28,694**	**1,891,294**
Females									
Under 1	17,555	13,187	8,197	3,576	3,980	1,075	661	1,245	49,476
1–4	21,288	13,092	12,477	5,464	5,089	1,046	798	1,285	60,539
5–14	24,639	17,070	13,898	7,157	6,671	1,302	1,004	1,116	72,857
15–24	63,909	50,387	42,289	18,622	20,150	4,374	2,758	4,591	207,080
25–34	107,586	93,245	60,527	29,457	30,382	6,174	4,880	5,753	338,004
35–44	71,779	68,656	43,072	23,172	22,701	4,623	3,640	5,699	243,342
45–54	59,928	61,654	40,660	22,196	19,691	4,848	3,820	6,807	219,604
55–64	68,162	62,084	41,870	21,346	19,605	5,101	3,936	4,952	227,056
65–74	90,640	79,441	45,262	22,918	26,136	5,437	4,572	2,325	276,731
75+	140,658	106,515	52,852	31,761	35,015	7,309	4,297	946	379,353
Total	666,182	565,331	361,104	185,669	189,420	41,289	30,366	34,719	2,074,080
Total separations	**1,260,945**	**1,089,861**	**694,721**	**352,759**	**362,303**	**79,487**	**61,945**	**63,491**	**3,965,512**

Note: Totals include separations for which age and/or sex was not reported.

Source: AIHW National Hospital Morbidity Database.

Table S31: Separations from private hospitals, by age group and sex, states and territories, 2001–02

Age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Males									
Under 1	3,680	3,012	2,764	2,889	639	561	300	n.a.	13,845
1–4	5,696	3,227	4,817	3,181	1,625	529	271	n.a.	19,346
5–14	9,264	6,073	6,820	4,073	2,273	1,004	407	n.a.	29,914
15–24	17,057	14,650	12,226	8,510	5,299	1,492	791	n.a.	60,025
25–34	21,209	16,804	16,118	9,339	5,770	1,850	707	n.a.	71,797
35–44	33,857	26,787	25,152	14,114	9,498	3,040	1,067	n.a.	113,515
45–54	48,762	37,474	42,924	19,295	14,340	4,446	1,904	n.a.	169,145
55–64	58,244	42,817	50,650	22,132	15,402	5,292	2,211	n.a.	196,748
65–74	53,581	43,991	48,071	19,316	15,106	5,206	1,993	n.a.	187,264
75+	61,250	54,087	60,579	19,858	17,021	6,848	2,065	n.a.	221,708
Total	**312,600**	**248,922**	**270,121**	**122,707**	**86,973**	**30,268**	**11,716**	**n.a.**	**1,083,307**
Females									
Under 1	2,257	2,089	1,833	2,014	440	378	203	n.a.	9,214
1–4	3,813	2,149	3,284	2,149	1,114	283	151	n.a.	12,943
5–14	7,293	5,295	5,597	3,570	1,972	796	278	n.a.	24,801
15–24	26,449	22,254	19,132	12,986	5,943	2,915	953	n.a.	90,632
25–34	56,742	47,637	43,916	22,909	11,704	5,773	2,640	n.a.	191,321
35–44	57,126	50,621	45,443	22,702	14,328	5,680	2,674	n.a.	198,574
45–54	58,430	53,300	51,868	24,897	18,830	6,241	2,982	n.a.	216,548
55–64	54,508	44,705	48,273	20,401	17,133	5,262	2,243	n.a.	192,525
65–74	50,227	44,392	47,286	17,971	15,351	5,051	1,553	n.a.	181,831
75+	62,956	58,453	56,320	19,446	23,973	7,980	1,793	n.a.	230,921
Total	**379,801**	**330,895**	**322,952**	**149,045**	**110,788**	**40,359**	**15,470**	**n.a.**	**1,349,310**
Total separations	**692,402**	**579,836**	**593,073**	**271,752**	**197,761**	**70,649**	**27,186**	**n.a.**	**2,432,659**

n.a. Not available.

Note: Totals include separations for which age and/or sex was not reported.

Source: AIHW National Hospital Morbidity Database.

Table S32: Patient days in public hospitals, by age group and sex, states and territories, 2001–02

Age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Males									
Under 1	111,628	85,018	58,406	25,245	28,336	8,287	6,213	11,978	335,111
1–4	54,561	36,116	28,610	15,448	13,691	2,292	2,308	6,682	159,708
5–14	73,073	44,627	39,822	21,643	16,484	3,572	3,069	4,992	207,282
15–24	181,466	96,429	99,254	42,520	41,364	8,326	6,536	7,003	482,898
25–34	273,396	131,646	128,846	56,073	55,367	11,532	9,692	11,117	677,669
35–44	256,034	140,992	129,673	59,553	66,427	11,665	8,674	14,032	687,050
45–54	233,488	178,655	138,714	62,755	68,096	15,196	12,509	14,994	724,407
55–64	322,768	237,070	171,894	77,292	94,923	28,801	17,628	14,759	965,135
65–74	493,636	382,405	217,485	108,103	138,729	34,931	19,044	9,997	1,404,330
75+	731,100	558,199	270,843	151,358	242,992	46,685	20,123	4,901	2,026,201
Total	**2,731,348**	**1,891,157**	**1,283,547**	**619,990**	**766,409**	**171,287**	**105,796**	**100,455**	**7,669,989**
Females									
Under 1	90,003	69,000	47,140	22,884	22,963	7,094	6,124	9,358	274,566
1–4	41,811	24,259	22,151	11,414	8,849	1,828	1,565	5,970	117,847
5–14	56,450	36,215	29,131	16,399	13,986	3,358	2,311	4,139	161,989
15–24	199,635	130,172	119,795	55,906	54,410	13,781	8,874	14,493	597,066
25–34	393,221	243,004	177,180	90,904	83,384	19,114	14,987	18,450	1,040,244
35–44	258,758	180,949	119,272	67,798	63,172	14,634	10,980	15,494	731,057
45–54	212,306	163,657	119,398	63,132	55,312	14,916	11,390	14,807	654,918
55–64	285,470	185,856	126,625	63,855	69,212	20,150	12,699	10,639	774,506
65–74	424,566	315,257	176,545	94,740	108,763	31,297	16,107	7,069	1,174,344
75+	1,147,548	852,717	372,972	255,830	312,380	64,404	28,892	5,089	3,039,832
Total	**3,109,904**	**2,201,086**	**1,310,209**	**742,862**	**792,431**	**190,576**	**113,929**	**105,508**	**8,566,505**
Total patient days	**5,841,989**	**4,092,276**	**2,593,756**	**1,362,852**	**1,558,840**	**361,871**	**219,725**	**206,191**	**16,237,500**

Note: Totals include separations for which age and/or sex was not reported.

Source: AIHW National Hospital Morbidity Database.

Table S33: Patient days in private hospitals, by age group and sex, states and territories, 2001–02

Age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Males									
Under 1	15,945	12,833	13,846	8,606	3,046	2,656	1,814	n.a.	58,746
1–4	7,566	3,552	6,438	4,051	1,696	641	277	n.a.	24,221
5–14	15,380	7,923	9,606	5,162	2,680	1,309	452	n.a.	42,512
15–24	28,561	28,841	24,890	14,481	9,342	2,414	1,325	n.a.	109,854
25–34	37,972	32,692	34,500	16,027	10,360	3,402	1,266	n.a.	136,219
35–44	59,622	52,590	47,569	23,883	17,554	5,864	2,170	n.a.	209,252
45–54	97,370	76,221	87,795	37,652	30,094	9,476	4,085	n.a.	342,693
55–64	127,194	98,786	113,527	47,590	37,726	12,725	5,333	n.a.	442,881
65–74	143,859	126,991	135,935	55,013	44,789	16,450	6,343	n.a.	529,380
75 and over	254,429	244,134	288,432	102,440	76,131	34,215	10,035	n.a.	1,009,816
Total	**787,898**	**684,563**	**762,538**	**314,905**	**233,418**	**89,152**	**33,100**	**n.a.**	**2,905,574**
Females									
Under 1	13,231	10,223	11,205	6,692	2,312	2,437	1,451	n.a.	47,551
1–4	6,306	2,474	4,527	2,857	1,160	352	151	n.a.	17,827
5–14	13,335	6,747	8,464	4,669	2,323	1,018	287	n.a.	36,843
15–24	48,642	40,394	40,304	23,987	11,402	6,072	1,961	n.a.	172,762
25–34	155,454	124,396	113,308	67,198	37,080	16,028	9,602	n.a.	523,066
35–44	131,709	116,694	100,100	57,378	36,538	13,408	7,957	n.a.	463,784
45–54	124,164	117,385	109,133	56,326	46,182	16,099	7,349	n.a.	476,638
55–64	126,770	107,406	110,127	49,115	44,434	14,644	5,831	n.a.	458,327
65–74	150,592	140,185	141,988	55,571	48,843	18,727	5,428	n.a.	561,334
75 and over	319,983	329,472	339,151	123,035	133,596	43,344	11,216	n.a.	1,299,797
Total	**1,090,186**	**995,376**	**978,307**	**446,828**	**363,870**	**132,129**	**51,233**	**n.a.**	**4,057,929**
Total patient days	**1,878,085**	**1,680,099**	**1,740,845**	**761,733**	**597,288**	**221,303**	**84,333**	**n.a**	**6,963,686**

n.a. Not available.

Note: Totals include separations for which age and/or sex was not reported.

Source: AIHW National Hospital Morbidity Database.

Table S34: Separation statistics by principal diagnosis, grouped into ICD-10-AM chapters, public hospitals, 2001–02

Principal diagnosis		Separations	Per cent same-day separations	Patient days	ALOS (days)	ALOS (days) excluding same-day
A00–B99	Infectious and parasitic diseases	77,559	23.7	286,084	3.7	4.5
C00–D48	Neoplasms	236,030	46.2	1,182,629	5.0	8.4
D50–D89	Blood, blood-forming diseases	51,521	64.3	130,107	2.5	5.3
E00–E90	Endocrine, nutritional, metabolic	67,743	34.3	366,389	5.4	7.7
F00–F99	Mental and behaviour disorders	159,108	24.8	2,124,422	13.4	17.4
G00–G99	Nervous system diseases	84,431	38.2	425,217	5.0	7.5
H00–H59	Eye and adnexa diseases	58,769	79.3	78,557	1.3	2.6
H60–H95	Ear and mastoid process diseases	29,596	61.0	45,582	1.5	2.4
I00–I99	Circulatory diseases	292,065	20.4	1,615,140	5.5	6.7
J00–J99	Respiratory diseases	248,364	15.3	1,095,092	4.4	5.0
K00–K93	Digestive diseases	346,401	47.2	998,124	2.9	4.6
L00–L99	Skin and subcutaneous tissue diseases	73,425	38.0	319,186	4.3	6.4
M00–M99	Musculoskeletal diseases	139,379	41.4	567,048	4.1	6.2
N00–N99	Genitourinary diseases	195,211	48.2	534,212	2.7	4.4
O00–O99	Pregnancy, childbirth and the puerperium	300,644	24.0	856,956	2.9	3.4
P00–P96	Conditions originating in the perinatal period	39,185	11.5	363,070	9.3	10.3
Q00–Q99	Congenital malformations	23,043	48.6	85,581	3.7	6.3
R00–R99	Symptoms, signs	260,515	42.5	625,614	2.4	3.4
S00–T98	Injuries and poisoning	352,489	32.6	1,407,612	4.0	5.4
Z00–Z99	Factors influencing health status and contact with health services	928,731	87.7	3,051,761	3.3	19.6
	Not reported	1,303	42.8	78,981	60.6	105.3
Total		**3,965,512**	**47.6**	**16,237,364**	**4.1**	**6.9**

Note: ALOS = average length of stay.

Source: AIHW National Hospital Morbidity Database.

Table S35: Separation statistics by principal diagnosis, grouped into ICD-10-AM chapters, private hospitals, 2001–02

Principal diagnosis		Separations	Per cent same-day separations	Patient days	ALOS (days)	ALOS (days) excluding same-day
A00–B99	Infectious and parasitic diseases	14,343	29.6	59,227	4.1	5.4
C00–D48	Neoplasms	222,739	58.9	731,087	3.3	6.6
D50–D89	Blood, blood-forming diseases	19,372	66.6	44,098	2.3	4.8
E00–E90	Endocrine, nutritional, metabolic	29,527	36.7	124,930	4.2	6.1
F00–F99	Mental and behaviour disorders	105,364	70.5	618,249	5.9	17.5
G00–G99	Nervous system diseases	56,871	31.4	143,445	2.5	3.2
H00–H59	Eye and adnexa diseases	119,179	85.2	127,012	1.1	1.4
H60–H95	Ear and mastoid process diseases	24,744	73.6	31,476	1.3	2.0
I00–I99	Circulatory diseases	148,937	29.2	657,538	4.4	5.8
J00–J99	Respiratory diseases	81,859	15.1	329,108	4.0	4.6
K00–K93	Digestive diseases	404,046	74.2	679,823	1.7	3.6
L00–L99	Skin and subcutaneous tissue diseases	40,638	66.0	124,060	3.1	7.0
M00–M99	Musculoskeletal diseases	211,689	42.0	711,591	3.4	5.1
N00–N99	Genitourinary diseases	160,926	56.6	354,898	2.2	3.8
O00–O99	Pregnancy, childbirth and the puerperium	124,207	32.4	443,848	3.6	4.8
P00–P96	Conditions originating in the perinatal period	9,975	5.1	71,979	7.2	7.5
Q00–Q99	Congenital malformations	10,697	56.1	22,092	2.1	3.4
R00–R99	Symptoms, signs	114,345	61.0	240,308	2.1	3.8
S00–T98	Injuries and poisoning	84,024	26.7	406,415	4.8	6.2
Z00–Z99	Factors influencing health status and contact with health services	437,093	87.0	1,007,025	2.3	11.0
	Not reported	12,084	55.3	35,477	2.9	5.3
Total		2,432,659	60.0	6,963,686	2.9	5.7

Note: ALOS = average length of stay.

Source: AIHW National Hospital Morbidity Database.

Table S36: Separation statistics by procedure in ICD-10-AM groupings, public hospitals, 2001–02

Procedure block		Separations	Per cent same-day separations	Patient days	ALOS (days)	ALOS (days) excluding same-day
1–86	Procedures on nervous system	126,600	22.5	847,168	6.7	8.3
110–129	Procedures on endocrine system	5,430	3.7	26,676	4.9	5.1
160–256	Procedures on eye and adnexa	68,505	78.6	107,407	1.6	3.6
300–333	Procedures on ear and mastoid process	27,290	66.0	49,579	1.8	3.4
370–422	Procedures on nose, mouth and pharynx	52,934	29.1	108,165	2.0	2.5
450–490	Dental services	29,601	84.5	123,211	4.2	21.4
520–569	Procedures on respiratory system	89,689	19.1	1,311,104	14.6	17.8
600–767	Procedures on cardiovascular system	190,128	22.7	1,729,863	9.1	11.5
800–817	Procedures on blood and blood-forming organs	25,076	36.0	201,355	8.0	12.0
850–1011	Procedures on digestive system	444,159	52.8	2,121,395	4.8	9.0
1040–1128	Procedures on urinary system	646,544	90.3	1,142,221	1.8	8.9
1160–1203	Procedures on prostate and seminal vesicle	38,562	54.3	100,191	2.6	4.5
1230–1299	Gynaecological procedures	189,270	67.0	363,930	1.9	3.8
1330–1347	Obstetric procedures	247,899	3.8	979,224	4.0	4.1
1360–1579	Procedures on musculoskeletal system	219,121	28.9	1,328,329	6.1	8.1
1600–1718	Dermatological and plastic procedures	163,721	49.2	866,878	5.3	9.5
1740–1759	Procedures on breast	17,321	45.5	47,375	2.7	4.2
1780–1799	Chemotherapeutic and radiation oncology procedures	135,535	81.7	354,832	2.6	9.9
1820–1916	Non-invasive, cognitive and interventions, nec	2,110,795	32.7	15,003,696	7.1	10.1
1940–2016	Imaging services	303,338	14.9	2,984,970	9.8	11.4
	No procedure or not reported	1,238,956	30.1	4,086,895	3.3	4.3
Total		**3,965,512**	**47.6**	**16,237,364**	**4.1**	**6.9**

ALOS = average length of stay; nec = not elsewhere classified.

Note: As more than one procedure can be reported for each separation, the totals are not the sums of the rows of the table.

Source: AIHW National Hospital Morbidity Database.

Table S37: Separation statistics by procedure in ICD–10–AM groupings, private hospitals, 2001–02

Procedure Block		Separations	Per cent same-day separations	Patient days	ALOS (days)	ALOS (days) excluding same-day
1–86	Procedures on nervous system	120,722	32.5	600,201	5.0	6.9
110–129	Procedures on endocrine system	5,144	1.8	17,213	3.3	3.4
160–256	Procedures on eye and adnexa	132,637	84.5	142,358	1.1	1.5
300–333	Procedures on ear and mastoid process	27,942	69.5	33,746	1.2	1.7
370–422	Procedures on nose, mouth and pharynx	66,772	32.1	87,643	1.3	1.5
450–490	Dental services	81,921	92.1	86,167	1.1	1.7
520–569	Procedures on respiratory system	32,891	20.8	270,604	8.2	10.1
600–767	Procedures on cardiovascular system	156,584	26.2	821,642	5.2	6.8
800–817	Procedures on blood and blood-forming organs	15,240	31.6	78,513	5.2	7.1
850–1011	Procedures on digestive system	635,074	75.4	1,409,157	2.2	6.0
1040–1128	Procedures on urinary system	186,601	76.0	401,719	2.2	5.8
1160–1203	Procedures on prostate and seminal vesicle	45,599	52.3	120,292	2.6	4.4
1230–1299	Gynaecological procedures	206,101	71.3	385,178	1.9	4.0
1330–1347	Obstetric procedures	119,148	1.4	621,175	5.2	5.3
1360–1579	Procedures on musculoskeletal system	258,785	39.8	923,741	3.6	5.3
1600–1718	Dermatological and plastic procedures	156,438	68.6	345,999	2.2	4.9
1740–1759	Procedures on breast	27,688	39.4	63,337	2.3	3.1
1780–1799	Chemotherapeutic and radiation oncology procedures	133,482	90.7	210,738	1.6	7.2
1820–1916	Non-invasive, cognitive and interventions, nec	1,791,253	52.8	6,869,004	3.8	7.0
1940–2016	Imaging services	98,838	20.1	851,434	8.6	10.5
	No procedure or not reported	281,284	26.7	982,474	3.5	4.4
Total		**2,432,659**	**60.0**	**6,963,686**	**2.9**	**5.7**

ALOS = average length of stay; nec = not elsewhere classified.

Note: As more than one procedure can be reported for each separation, the totals are not the sums of the rows of the table.

Source: AIHW National Hospital Morbidity Database.

Table S38: Separations[(a)], same-day separations, patient days, average length of stay and cost by Major Diagnostic Category, public hospitals, 2001–02

Major Diagnostic Category[(b)]		Separations	Per cent same-day separations	Patient days	ALOS (days)	ALOS (days) excluding same-day	Estimated cost ($'000)[(c)]
01	Nervous system	188,561	33.3	1,030,137	5.5	7.7	723,896
02	Eye diseases, disorders	74,061	76.8	104,110	1.4	2.8	147,947
03	Ear, nose, mouth, throat	164,449	47.4	270,115	1.6	2.2	273,752
04	Respiratory system	230,791	15.4	1,139,687	4.9	5.7	777,927
05	Circulatory system	330,506	24.4	1,335,899	4.0	5.0	1,261,075
06	Digestive system	407,716	48.1	1,087,875	2.7	4.2	912,443
07	Hepatobiliary system and pancreas	72,108	19.6	309,077	4.3	5.1	267,702
08	Musculoskeletal system and connective tissue	295,590	36.4	1,248,657	4.2	6.1	1,209,219
09	Skin, subcutaneous tissue and breast	151,578	51.5	452,480	3.0	5.1	346,578
10	Endocrine, nutritional and metabolic	50,607	24.8	257,590	5.1	6.4	188,461
11	Kidney and urinary tract	669,165	88.8	972,287	1.5	5.0	579,082
12	Male reproductive	42,859	54.9	101,253	2.4	4.0	95,419
13	Female reproductive	122,212	62.6	242,207	2.0	3.6	266,985
14	Pregnancy, childbirth and puerperium	311,750	24.6	882,037	2.8	3.4	733,102
15	Newborns, neonates	50,749	11.6	395,029	7.8	8.7	345,194
16	Blood, blood-forming organs, immunological	59,355	65.8	140,450	2.4	5.0	107,139
17	Neoplastic disorders	163,727	88.2	300,166	1.8	8.0	229,367
18	Infectious and parasitic diseases	51,667	20.4	239,052	4.6	5.6	179,934
19	Mental diseases and disorders	123,368	27.4	1,388,975	11.3	15.1	556,057
20	Alcohol/drug use and disorders	26,927	23.7	123,167	4.6	5.7	52,123
21	Injury, poison, toxic effects of drugs	117,077	39.1	329,042	2.8	4.0	310,318
22	Burns	6,248	28.5	34,800	5.6	7.4	36,374
23	Factors influencing health status, other contacts	106,501	71.3	322,818	3.0	8.1	166,250
ED	Error DRG[(d)]	11,243	20.9	276,392	24.6	30.8	64,595
PR	Pre-MDC[(d)]	9,679	3.9	167,922	17.3	18.0	490,876
Total		3,838,494	48.4	13,151,224	3.4	5.7	10,321,814

(a) Separations for acute and unspecified episode of care only.

(b) Major Diagnostic Categories (MDCs) are groupings of AR-DRGs within the AR-DRG (casemix) classification.

(c) 'Pre-MDC' is a group of particularly resource-intensive AR-DRGs such as transplants. Separations in the 'Error DRG' grouping did not have a valid AR-DRG.

(d) The estimated total hospital cost is the sum of the estimated costs for each AR-DRG within the Major Diagnostic Category, calculated using the estimated average cost for each AR-DRG in public hospitals in 2001–02.

Note: Abbreviations: ALOS = average length of stay; MDC = Major Diagnostic Category; AR-DRG = Australian Refined Diagnosis Related Group.

Source: AIHW National Hospital Morbidity Database.

Table S39: Separations[(a)], same-day separations, patient days, average length of stay and cost by Major Diagnostic Category, private hospitals, 2001–02

Major Diagnostic Category[(b)]		Separations	Per cent same-day separations	Patient days	ALOS (days)	ALOS (days) excluding same-day	Estimated cost ($'000)[(c)]
01	Nervous system	59,112	40.1	307,281	5.2	8.0	222,575
02	Eye diseases, disorders	132,030	84.7	141,141	1.1	1.4	266,281
03	Ear, nose, mouth, throat	174,310	65.4	213,881	1.2	1.7	287,953
04	Respiratory system	70,843	8.2	358,826	5.1	5.4	209,188
05	Circulatory system	142,084	22.6	585,036	4.1	5.0	657,970
06	Digestive system	420,996	75.2	778,999	1.9	4.4	701,583
07	Hepatobiliary system and pancreas	32,654	10.0	120,460	3.7	4.0	123,739
08	Musculoskeletal system and connective tissue	268,039	40.0	986,646	3.7	5.5	1,199,544
09	Skin, subcutaneous tissue and breast	146,747	67.6	307,825	2.1	4.4	331,403
10	Endocrine, nutritional and metabolic	20,370	24.5	92,036	4.5	5.7	87,542
11	Kidney and urinary tract	160,958	79.1	273,632	1.7	4.3	205,701
12	Male reproductive	45,186	56.6	106,936	2.4	4.2	110,378
13	Female reproductive	132,438	66.6	263,030	2.0	4.0	308,696
14	Pregnancy, childbirth and puerperium	128,603	32.6	460,025	3.6	4.8	315,782
15	Newborns, neonates	13,344	12.8	80,354	6.0	6.8	56,932
16	Blood, blood-forming organs, immunological	21,571	68.0	47,245	2.2	4.7	35,062
17	Neoplastic disorders	145,613	92.9	200,402	1.4	6.3	146,627
18	Infectious and parasitic diseases	11,595	11.8	68,453	5.9	6.6	45,950
19	Mental diseases and disorders	81,070	72.3	422,131	5.2	16.2	153,472
20	Alcohol/drug use and disorders	12,250	65.2	65,471	5.3	13.5	17,172
21	Injury, poison, toxic effects of drugs	19,352	31.9	68,681	3.5	4.7	56,829
22	Burns	403	24.1	2,127	5.3	6.6	2,319
23	Factors influencing health status, other contacts	103,359	86.3	191,041	1.8	7.2	132,367
ED	Error DRG[(d)]	18,591	51.5	43,459	2.3	3.8	79,756
PR	Pre-MDC[(d)]	1,461	3.3	73,082	50.0	51.7	79,919
Total		**2,362,979**	**60.4**	**6,258,200**	**2.6**	**5.2**	**5,834,739**

(a) Separations for acute and unspecified episode of care only.

(b) Major Diagnostic Categories (MDCs) are groupings of AR-DRGs within the AR-DRG (casemix) classification.

(c) 'Pre-MDC' is a group of particularly resource-intensive AR-DRGs such as transplants. Separations in the 'Error DRG' grouping did not have a valid AR-DRG.

(d) The estimated total hospital cost is the sum of the estimated costs for each AR-DRG within the Major Diagnostic Category, calculated using the estimated average cost for each AR-DRG in public hospitals in 2001–02.

Note: Abbreviations: ALOS = average length of stay; MDC = Major Diagnostic Category; AR-DRG = Australian Refined Diagnosis Related Group.

Source: AIHW National Hospital Morbidity Database.

Table S40: Top 15 generic medications by defined daily dose and volume, 2001–02 and 2002–03

	2000–01				2002–03				% difference 2000–01 to 2002–03			
	DDD		Volume (000)		DDD		Volume (000)		DDD		Volume	
Generic name	**PBS/ RPBS**	**Total**	**PBS/ RPBS**	**Total**	**PBS/ RPBS**	**Total**	**PBS/ RPBS**	**Total**	**PBS/ RPBS**	**Total**	**PBS/ RPBS**	**Total**
Atorvastatin	44.4	44.4	4,747	4,752	66.0	66.1	6,203	6,215	48.8	48.8	30.7	30.8
Simvastatin	32.4	32.5	4,787	4,792	43.5	43.5	5,461	5,466	34.0	34.0	14.1	14.1
Diltiazem hydrochloride	57.8	57.9	1,487	1,488	41.1	41.3	1,529	1,531	–29.0	–28.7	2.9	2.8
Salbutamol	22.2	30.2	3,589	4,736	20.4	27.9	3,318	4,389	–8.0	–7.5	–7.6	–7.3
Ramipril	12.8	12.9	1,561	1,593	26.3	26.9	2,501	2,637	105.6	108.8	60.3	65.5
Omeprazole	15.3	15.4	2,762	2,782	22.6	22.7	4,665	4,675	47.6	46.9	68.9	68.0
Rofecoxib	4.2	4.3	669	677	20.6	20.8	2,929	2,948	385.8	385.3	337.7	335.3
Frusemide	20.0	21.6	1,367	1,482	19.5	20.7	1,376	1,467	–2.8	–4.3	0.7	–0.9
Irbesartan	14.6	14.6	2,458	2,460	18.1	18.2	3,074	3,114	23.8	24.4	25.1	26.6
Irbesartan with hydrochlorothiazide	7.8	7.8	1,076	1,076	17.6	17.7	2,381	2,386	126.3	126.8	121.3	121.8
Aspirin	12.9	14.0	1,257	1,378	15.6	16.7	1,352	1,456	21.5	19.6	7.6	5.6
Amlodipine besylate	15.1	15.9	2,337	2,504	15.2	16.2	2,327	2,568	0.2	2.2	–0.5	2.6
Celecoxib	29.0	29.4	3,852	3,966	15.8	15.9	3,535	3,567	–45.7	–45.9	–8.2	–10.1
Sertraline	14.3	14.4	2,257	2,267	15.7	15.8	2,441	2,454	10.1	10.2	8.1	8.3
Thyroxine sodium	8.6	13.3	548	827	9.6	14.5	624	922	11.8	9.1	13.8	11.4

Note: DDD = defined daily dose; PBS = Pharmaceutical Benefits Scheme; RPBS = Repatriation Pharmaceutical Benefits Scheme.

Source: DoHA Drug Utilisation Sub-Committee (DUSC) database, as at 12 January 2004.

Health expenditure

Table S41: Commonwealth government receipts from the Medicare levy and total taxation revenue, current prices, 1984–85 to 2001–02 ($ million)

Revenue type	1984–85	1990–91	1992–93	1994–95	1996–97	1998–99	2000–01	2001–02
Medicare levy	1,223	2,480	2,415	3,030	3,664	4,100	4,580	4,970
Total taxation revenue	53,208	93,225	89,435	105,687	125,815	139,202	144,255	150,756
Medicare levy as a proportion of total taxation revenue	2.3%	2.7%	2.7%	2.9%	2.9%	2.9%	3.2%	3.3%

Source: Commonwealth of Australia Budget Papers, various years.

Table S42: Health-related taxation expenditures, current and constant[(a)] prices, 1991–92 to 2001–02 ($ million)

Year	Current prices	Constant prices
1991–92	82	96
1992–93	91	105
1993–94	95	107
1994–95	91	102
1995–96	105	116
1996–97	125	134
1997–98	285	307
1998–99	309	330
1999–00	341	362
2000–01	150	150
2001–02	160	154

(a) See Box 5.2 for explanation of constant price estimating method.

Source: AIHW Health Expenditure Database.

Table S43: Total health expenditure (current prices), by source of funds[(a)], 2000–01 ($ million)

	Government sector			Non-government sector				
Health service type	**Common-wealth**	**State and local**	**Total**	**Health insurance funds**	**Indivi-duals**	**Other[(b)]**	**Total**	**Total all sectors**
Total hospitals	9,147	7,368	16,515	2,225	543	925	3,693	20,208
Public (non-psychiatric) hospitals	7,490	6,999	14,488	216	227	410	853	15,341
Public psychiatric hospitals	—	369	369	—	15	6	21	390
Private hospitals	1,659	—	1,659	2,009	300	509	2,819	4,477
High level residential aged care	2,877	284	3,161	—	737	—	737	3,899
Ambulance	127	471	597	121	231	44	397	994
Total institutional	*12,151*	*8,123*	*20,274*	*2,347*	*1,511*	*969*	*4,827*	*25,101*
Medical services	8,419	—	8,419	287	1,078	492	1,857	10,276
Other professional services	525	—	525	224	1,462	230	1,915	2,440
Pharmaceuticals	4,397	—	4,397	36	3,580	73	3,689	8,085
Benefit-paid pharmaceuticals	4,316	—	4,316	—	775	—	775	5,091
All other items	81	—	81	36	2,805	73	2,914	2,995
Aids and appliances	180	—	180	180	1,700	47	1,928	2,108
Other non-institutional services	1,956	3,156	5,112	1,087	1,893	13	2,993	8,105
Community and public health[(c)]	602	2,488	3,090	—	—	5	5	3,095
Dental services	322	341	663	520	1,893	8	2,421	3,084
Health administration	1,032	326	1,358	566	—	—	566	1,924
Other non-institutional	1	—	1	—	—	—	—	1
Research	780	156	935	—	—	246	246	1,182
Total non-institutional	*16,257*	*3,311*	*19,568*	*1,813*	*9,713*	*1,101*	*12,628*	*32,196*
Total recurrent expenditure	**28,408**	**11,435**	**39,842**	**4,160**	**11,224**	**2,070**	**17,454**	**57,297**
Capital expenditure	84	1,373	1,457	n.a.	n.a.	n.a.	1,174[(d)]	2,631
Capital consumption	26	944	970	n.a.	n.a.	n.a.	n.a. [(e)]	970
Total health expenditure[(f)]	**28,518**	**13,751**	**42,269**	**n.a.**	**n.a.**	**n.a.**	**18,629**	**60,897**

— Nil or rounded to zero.

n.a. Not available.

(a) This table shows funding provided by the Commonwealth Government, state and territory Governments and local government authorities and by the major non-government sources of funding for health services. It ;does not show gross outlays on health services by the different service provider sectors.

(b) 'Other' includes expenditure on health services by workers' compensation and compulsory motor vehicle third party insurers as well as other sources of income (e.g. interest earned) of service providers.

(c) Includes expenditure that was previously classified as 'other non-institutional (nec)' as well as expenditure on community and public health services.

(d) Capital outlays for the non-government sector cannot be allocated according to source of funds.

(e) Non-government capital consumption (depreciation) is included as part of recurrent expenditure.

(f) Not adjusted for tax expenditure.

Note: Some components may not add to totals due to rounding.

Source: AIHW Health Expenditure Database.

Table S44: Preliminary estimate of total health expenditure (current prices), by source of funds[(a)], 2001–02 ($ million)

	Government sector			Non-government sector				
Health service type	**Common-wealth**	**State and local**	**Total**	**Health insurance funds**	**Indivi-duals**	**Other[(b)]**	**Total**	**Total all sectors**
Total hospitals	9,788	8,092	17,880	2,643	586	1,126	4,355	22,236
Public (non-psychiatric) hospitals	8,002	7,707	15,709	262	249	458	969	16,678
Public psychiatric hospitals	–1	385	385	—	18	7	24	409
Private hospitals	1,787	—	1,787	2,381	320	661	3,362	5,149
High level residential aged care	3,093	213	3,306	—	831	—	831	4,137
Ambulance	131	517	648	132	256	50	438	1,086
Total institutional	*13,012*	*8,822*	*21,834*	*2,776*	*1,672*	*1,176*	*5,624*	*27,459*
Medical services	9,059	—	9,059	418	1,195	515	2,128	11,187
Other professional services	579	—	579	293	1,415	234	1,942	2,521
Pharmaceuticals	4,832	—	4,832	44	4,030	83	4,157	8,989
Benefit-paid pharmaceuticals	4,746	—	4,746	—	841	—	841	5,586
All other items	86	—	86	44	3,189	83	3,317	3,403
Aids and appliances	195	—	195	223	1,932	54	2,209	2,403
Other non-institutional services	2,045	3,382	5,428	1,172	2,293	15	3,481	8,908
Community and public health[(c)]	645	2,671	3,316	—	–1	6	5	3,321
Dental services	360	365	725	661	2,293	10	2,964	3,689
Health administration	1,039	347	1,386	511	—	—	511	1,897
Other non-institutional	1	—	1	—	—	—	—	1
Research	834	166	1,000	—	—	226	226	1,226
Total non-institutional	*17,544*	*3,548*	*21,092*	*2,150*	*10,864*	*1,128*	*14,142*	*35,235*
Total recurrent expenditure	**30,556**	**12,370**	**42,927**	**4,926**	**12,536**	**2,304**	**19,767**	**62,693**
Capital expenditure	90	1,462	1,552	n.a.	n.a.	n.a.	1,305[(d)]	2,856
Capital consumption	27	1,005	1,033	. .	. .	. .	. . [(e)]	1,033
Total health expenditure[(f)]	**30,674**	**14,837**	**45,511**	**n.a.**	**n.a.**	**n.a.**	**21,071**	**66,582**

— Nil or rounded to zero.

. . Not applicable.

n.a. Not available.

Note: Some components may not add to totals due to rounding.

(a) This table shows funding provided by the Commonwealth Government, State and Territory Governments and local government authorities and by the major non-government sources of funding for health services. It does not show gross outlays on health services by the different service provider sectors.

(b) 'Other' includes expenditure on health services by workers' compensation and compulsory motor vehicle third party insurers as well as other sources of income (e.g. interest earned) of service providers.

(c) Includes expenditure that was previously classified as 'other non-institutional (nec)' as well as expenditure on community and public health services.

(d) Capital outlays for the non-government sector cannot be allocated according to source of funds.

(e) Non-government capital consumption (depreciation) is included as part of recurrent expenditure.

(f) Not adjusted for tax expenditure.

Source: AIHW Health Expenditure Database.

Table S45: Annual growth in recurrent health expenditure (constant prices)[(a)], 1991–92 to 2000–01 (per cent)

Health service type	1991–92 to 1992–93	1992–93 to 1993–94	1993–94 to 1994–95	1994–95 to 1995–96	1995–96 to 1996–97	1996–97 to 1997–98	1997–98 to 1998–99	1998–99 to 1999–00	1999–00 to 2000–01	2000–01 to 2001–02	1991–92 to 2001–02	1992–93 to 1997–98	1997–98 to 2001–02	1999–00 to 2001–02
Total institutional	1.3	2.0	3.7	4.3	3.2	4.6	3.9	3.0	1.0	5.7	3.0	3.5	2.6	3.3
Hospitals	1.5	2.1	4.6	3.8	3.7	3.5	4.0	2.6	1.1	6.2	3.0	3.5	2.6	3.6
Public (non-psychiatric) hospitals	0.9	0.8	3.3	4.8	6.6	6.2	3.3	2.9	1.6	5.3	3.3	4.3	2.6	3.4
Public psychiatric hospitals	–10.3	–5.1	–4.2	–7.3	–11.0	–9.1	1.9	3.8	–10.5	1.6	–5.9	–7.4	–1.8	–4.6
Private hospitals	5.9	7.3	9.8	2.3	–2.8	–3.6	6.4	1.4	0.8	9.7	3.0	2.5	2.8	5.1
High level residential aged care	0.2	0.0	1.1	5.6	6.0	7.4	3.2	–1.6	1.4	2.8	2.5	4.0	1.0	2.1
Ambulance	4.2	0.9	–7.6	11.9	–3.0	24.2	5.1	38.8	–2.5	6.6	7.1	4.7	12.5	1.9
Other institutional (nec)	0.1	66.3	5.2	7.6	—	—	—	—	—	—	—	—	—	—
Total non-institutional	8.0	3.4	4.2	4.6	5.5	2.1	4.1	9.1	9.3	6.1	5.6	3.9	7.5	7.7
Medical services	8.4	4.0	4.0	3.7	2.7	1.9	2.7	5.0	1.5	4.1	3.7	3.2	3.1	2.8
Other health professionals	4.0	–1.5	–3.9	–4.1	12.2	–11.5	14.7	4.7	19.6	*–5.2*	3.4	–2.0	12.8	6.5
Pharmaceuticals	10.3	1.4	9.9	7.9	9.0	8.0	8.2	11.7	17.1	10.7	9.2	7.2	12.3	13.9
Benefit-paid items	20.1	1.3	11.2	17.1	8.8	3.1	9.3	13.0	20.9	9.7	11.5	8.2	14.3	15.2
All other items	–0.5	1.5	8.2	–4.6	9.4	16.1	6.6	9.8	11.2	12.4	6.2	5.9	9.2	11.8
Aids and appliances	12.6	15.8	1.8	3.5	3.3	3.4	7.4	25.0	23.4	12.7	10.4	5.4	18.3	18.0
Other non-institutional services	7.2	2.6	3.1	5.9	5.5	2.3	–0.9	–99.8	–12.2	—	4.3	3.9	4.2	—
Community/public health	15.0	11.4	–4.9	16.5	18.0	3.0	11.8	2.2	4.0	5.2	7.7	7.7	5.4	4.2
Dental services	13.2	1.9	1.2	4.4	3.0	–2.2	–4.4	3.1	4.8	14.0	2.7	1.6	1.1	9.3
Health administration	–10.7	–6.3	19.9	–3.0	–4.6	11.3	–14.2	34.0	8.6	*–3.6*	2.8	2.9	7.6	2.3
Other non–institutional (nec)	–1.5	–0.3	0.9	–0.9	—	—	—	—	—	—	–26.3	n.a.	—	—
Research	0.1	11.4	10.0	6.0	5.2	–5.9	8.0	29.1	20.9	1.1	9.0	5.2	19.0	10.6
Total recurrent expenditure	**4.7**	**2.7**	**4.0**	**4.4**	**4.4**	**3.3**	**4.0**	**6.2**	**5.5**	**5.9**	**4.4**	**3.8**	**5.2**	**5.7**

nec Not elsewhere classified.

Note: Some components may not add to totals due to rounding.

(a) See Box 5.2 for explanation of constant price estimating method.

Source: AIHW Health Expenditure Database.

Table S46: Total health expenditure, current and constant prices[(a)], and annual growth rates, 1991–92 to 2001–02

	Amount ($ million)		Growth rate (%)	
	Current	Constant	Current	Constant
1991–92	33,123	41,002	. .	. .
1992–93	35,098	43,093	6.0	5.1
1993–94	36,990	44,417	5.4	3.1
1994–95	39,216	46,062	6.0	3.7
1995–96	42,082	48,021	7.3	4.3
1996–97	45,296	50,362	7.6	4.9
1997–98	48,273	52,280	6.6	3.8
1998–99	51,629	54,632	7.0	4.5
1999–00	55,809	57,810	8.1	5.8
2000–01	60,897	60,897	9.1	5.3
2001–02[(b)]	66,582	64,529	9.3	6.0
Average annual growth rates				
1992–93 to 1997–98			6.6	3.9
1997–98 to 2001–02			8.4	5.4
1991–92 to 2001–02			7.2	4.6

. . Not applicable.

(a) See Box 5.2 for explanation of constant price estimating method.

(b) Based on preliminary AIHW and ABS estimates.

Source: AIHW Health Expenditure Database.

Table S47: Estimated health expenditures for Aboriginal and Torres Strait Islander Australians and other Australians, total and per person, 1998–99

	Total ($m)		Per person ($)		Ratio
Delivery	Indigenous	Other Australian	Indigenous	Other Australian	Indigenous/ other Australian
Through state programs					
Admitted patient expenditure	453	10,096	1,115	548	2.04
Other through state program expenditure	443	6,850	1,090	372	2.93
Total	896	16,947	2,205	920	2.40
Through Commonwealth programs					
Indigenous specific Commonwealth programs	121	10	298	1	—
Medicare/PBS	91	11,071	224	601	0.37
Other Commonwealth programs	69	6,196	169	336	0.50
Total	281	17,277	691	938	0.74
Through local government programs	8	206	20	11	1.78
Through private sector programs	60	11,982	148	650	0.23
Total recurrent expenditure	1,245	46,412	3,065	2,518	1.22

— Nil or rounded to zero.

Note: Some components may not add to totals due to rounding.

Source: AIHW 2001a.

Table S48: Recurrent expenditure on health (current prices), 1991–92 to 2000–01 (per cent)

Area of expenditure	1991–92	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02
Hospitals	39.7	38.5	37.5	37.3	37.2	37.5	37.8	37.9	36.6	35.3	35.4
Public (non-psychiatric) hospitals	30.7	29.7	28.7	28.3	28.1	28.3	28.9	28.8	27.7	26.8	26.7
Public psychiatric hospitals	1.8	1.6	1.4	1.3	1.1	1.0	0.8	0.8	0.8	0.7	0.7
Private hospitals	7.1	7.2	7.4	7.8	8.0	8.2	8.1	8.2	8.0	7.8	8.0
High level residential aged care	8.4	8.0	7.7	7.4	7.4	7.5	7.7	7.7	7.1	6.8	6.6
Ambulance	1.4	1.4	1.4	1.2	1.3	1.2	1.4	1.4	1.9	1.7	1.7
Other institutional (nec)	0.2	0.2	0.3	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Total institutional	*49.7*	*48.1*	*46.9*	*46.3*	*46.3*	*46.1*	*47.0*	*47.0*	*45.6*	*44.0*	*43.7*
Medical services	19.0	19.5	19.9	20.0	19.8	19.2	18.9	18.8	18.6	17.9	17.9
Other health professionals	3.7	3.7	3.6	3.6	3.4	3.7	3.3	3.7	3.7	4.3	4.0
Pharmaceuticals	9.9	10.4	11.0	11.5	11.7	12.0	12.3	12.6	13.0	14.1	14.4
Benefit-paid items	5.2	5.9	6.6	6.9	7.6	7.7	7.5	7.7	8.0	8.9	8.9
All other items	4.7	4.5	4.4	4.6	4.2	4.4	4.9	4.9	5.0	5.2	5.4
Aids and appliances	2.3	2.5	2.8	2.8	2.7	2.7	2.7	2.7	3.2	3.7	3.8
Other non-institutional services[(a)]	13.8	14.3	14.3	14.2	14.3	14.5	14.4	13.8	14.1	14.1	14.2
Community/public health[(b)]	4.4	4.9	5.2	4.7	5.1	5.6	5.5	5.8	5.5	5.4	5.3
Dental services	5.3	5.9	5.9	5.9	6.0	6.0	5.7	5.3	5.3	5.4	5.9
Health administration	4.1	3.5	3.2	3.6	3.3	3.0	3.2	2.6	3.3	3.4	3.0
Research[(c)]	1.5	1.4	1.5	1.6	1.6	1.6	1.4	1.5	1.8	2.1	2.0
Total non-institutional	*50.3*	*51.9*	*53.1*	*53.7*	*53.7*	*53.9*	*53.0*	*53.0*	*54.4*	*56.2*	*56.3*
Total recurrent expenditure	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

nec Not elsewhere classified.

(a) 'Other non-institutional services' is a summary of community and public health, dental services and administration.

(b) Includes expenditure that was previously classified as 'other non-institutional (nec)' as well as expenditure on community and public health services.

(c) Health services research expenditure has been allocated according to the level of government or the private sector organisation that actually undertakes the research activity, not according to source of funds.

Source: AIHW Health Expenditure Database.

Table S49: Total recurrent expenditure on health, constant prices[(a)], 1991–92 to 2001–02 ($ million)

Area of expenditure	1991–92	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02[(b)]
Hospitals	15,522	15,753	16,076	16,813	17,448	18,101	18,731	19,474	19,867	20,208	21,460
Public (non-psychiatric) hospitals	11,405	11,503	11,590	11,968	12,545	13,377	14,203	14,674	14,989	15,341	16,154
Public psychiatric hospitals	672	603	572	549	509	453	411	419	436	390	396
Private hospitals	3,445	3,647	3,914	4,296	4,394	4,272	4,117	4,381	4,442	4,477	4,910
High care residential aged care	3,113	3,118	3,117	3,150	3,326	3,526	3,786	3,907	3,844	3,899	4,007
Ambulance	534	557	561	519	581	563	699	735	1,020	994	1,059
Other institutional (nec)	84	84	139	146	158	—	—	—	—	—	—
Total institutional	*19,252*	*19,511*	*19,893*	*20,628*	*21,512*	*22,190*	*23,216*	*24,117*	*24,730*	*25,101*	*26,527*
Medical services	7,384	8,004	8,323	8,653	8,975	9,214	9,388	9,641	10,120	10,276	10,699
Other health professionals	1,812	1,884	1,855	1,783	1,711	1,920	1,699	1,949	2,040	2,440	2,312
Pharmaceuticals	3,655	4,032	4,088	4,492	4,849	5,286	5,707	6,176	6,902	8,085	8,948
Benefit-paid items	1,917	2,302	2,333	2,593	3,038	3,305	3,407	3,725	4,210	5,091	5,583
All other items	1,738	1,730	1,755	1,899	1,812	1,982	2,300	2,451	2,692	2,995	3,365
Aids and appliances	867	976	1,130	1,151	1,191	1,230	1,272	1,367	1,708	2,108	2,377
Other non-institutional services[(c)]	5,531	5,931	6,087	6,278	6,646	7,012	7,171	7,105	7,703	8,105	8,614
Community and public health[(d)]	1,603	1,841	2,030	1,940	2,229	2,574	2,645	2,928	2,988	3,096	3,243
Dental services	2,433	2,755	2,806	2,839	2,963	3,051	2,983	2,853	2,942	3,084	3,516
Health administration	1,496	1,335	1,251	1,499	1,454	1,386	1,543	1,323	1,773	1,924	1,855
Research[(e)]	544	545	607	668	708	745	701	757	977	1,182	1,195
Total non-institutional	*19,793*	*21,371*	*22,090*	*23,025*	*24,079*	*25,406*	*25,937*	*26,995*	*29,450*	*32,196*	*34,145*
Total recurrent expenditure	**39,046**	**40,882**	**41,983**	**43,653**	**45,591**	**47,596**	**49,153**	**51,112**	**54,180**	**57,297**	**60,672**

— Nil or rounded to zero.

nec Not elsewhere classified.

(a) See Box 5.2 for explanation of constant price estimating method.

(b) Based on preliminary AIHW and ABS estimates.

(c) Other non-institutional services' is a summary of community and public health, dental services and administration.

(d) ncludes expenditure that was previously classified as 'other non-institutional (nec)' as well as expenditure on community and public health services.

(e) Health services research expenditure has been allocated according to the level of government or the private sector organisation that actually undertakes the research activity, not according to source of funds.

Note: Some components may not add to totals due to rounding.

Source: AIHW Health Expenditure Database.

Table S50: Expenditure by Commonwealth, states and territories on core public health categories including overheads and program-wide expenditure ($ million), 2000–01

	Level of government incurring expenditure		
Public health activity category	**Australian government[(a)]**	**State and territory governments[(b)]**	**All governments[(c)]**
Communicable disease control	21.3	142.3	163.6
Selected health promotion activities	30.9	124.4	155.3
Immunisation	50.9	118.1	169.0
Environmental health	14.5	50.7	65.2
Food standards & hygiene	16.6	18.4	35.1
Breast cancer screening	3.3	92.7	96.1
Cervical screening	61.8	26.2	88.2
Prevention of hazardous and harmful drug use	41.2	105.0	146.2
Research	55.4	12.7	68.0
Total expenditure	296.3	690.7	987.0
Percentage of total	30.0%	70.0%	100.0%

(a) Excludes specific purpose payments to states and territories, but includes expenses related to the direct purchase of public health services from state and territory government instrumentalities.

(b) Includes total expenditure on state/territory public health activities that were fully or partly funded using special purpose funding from the Commonwealth.

(c) There may be some small amounts of double-counting because of the inclusion in state and territory government estimates of the total expenditure incurred in providing services that might have been directly purchased by the Commonwealth.

Note: Some components may not add to totals due to rounding.

Source: AIHW 2003.

Table S51: Health expenditure as a proportion of GDP, Australia and selected OECD countries, 1991 to 2001 (per cent)

Year[(a)]	**Australia**	**Canada**	**France**	**Japan**	**New Zealand**	**United Kingdom**	**United States**	**Group average[(b)]**
1991	8.1	9.7	8.8	5.9	7.4	6.5	12.6	10.0
1996	8.5	9.0	9.5	6.9	7.2	7.0	13.2	10.6
2001	9.3	9.7	9.5	8.0	8.1	7.6	13.9	11.5

(a) Australian and New Zealand data relate to the year commencing 1 July; data for France relates to the calendar year indicated; data for Canada, Japan and the United Kingdom relate to the year commencing 1 April; and United States data relate to the year ending 30 September.

(b) Average weighted by GDP.

Sources: AIHW Health Expenditure Database; OECD 2003.

Table S52: International comparison of health expenditure as a proportion of GDP and per person, OECD countries(a), 1991 to 2001

	1991		1996		2001	
	Health to GDP (%)	Per person ($AU)	Health to GDP (%)	Per person ($AU)	Health to GDP (%)	Per person ($AU)
Australia	8.1	1,904	8.5	2,458	9.3	3,397
Austria	7.1	1,741	8.3	2,421	7.7	2,936
Belgium	7.8	1,876	8.8	2,551	9.0	3,336
Canada	9.7	2,483	9.0	2,721	9.7	3,741
Czech Republic	5.2	685	7.1	1,193	7.3	1,481
Denmark	8.4	2,082	8.3	2,604	8.6	3,354
Finland	8.9	1,939	7.6	1,932	7.0	2,467
France	8.8	2,240	9.5	2,583	9.5	3,432
Greece	7.2	992	9.6	1,658	9.4	2,025
Hungary	7.1	729	7.2	863	6.8	1,221
Iceland	8.2	1,997	8.4	2,508	9.1	3,540
Ireland	6.5	1,125	6.6	1,611	6.5	2,593
Italy	8.3	1,973	7.5	2,036	8.4	2,965
Japan	5.9	1,594	6.9	2,192	8.0	2,856
Mexico	5.2	416	5.1	472	6.0	718
Netherlands	8.2	1,930	8.3	2,363	8.9	3,519
New Zealand	7.4	1,356	7.2	1,639	8.1	2,291
Norway	8.1	2,077	7.9	2,634	8.0	3,913
Poland	6.6	405	6.4	614	6.3	843
Portugal	6.8	998	8.5	1,554	9.2	2,162
Spain	6.9	1,257	7.6	1,582	7.5	2,144
Sweden	8.1	2,001	8.4	2,313	8.7	3,042
Switzerland	9.2	2,769	10.4	3,399	11.1	4,451
United Kingdom	6.5	1,410	7.0	1,872	7.6	2,669
United States	12.6	4,051	13.2	4,930	13.9	6,548
OECD average[(a)]	9.4	2,209	9.9	2,731	10.6	3,690

(a) Only includes countries that reported health expenditure in all three years shown.

Source: OECD 2003.

Table S53: Components of growth in health expenditure, Australia and other selected OECD countries, 1991 to 2001[(a)] (per cent)

	Australia	Canada	France	Japan[(b)]	New Zealand[(c)]	United Kingdom[(d)]	United States
Nominal growth in health expenditure	7.2	5.5	5.0	7.2	7.1	7.2	6.4
Health inflation	2.5	1.6	1.4	2.9	3.0	4.3	3.5
General inflation	1.8	1.5	1.4	0.3	1.9	2.7	2.0
Excess health inflation[(e)]	0.7	0.1	—	2.7	1.1	1.5	1.4
Real growth in health expenditure	4.6	3.8	3.6	4.1	4.0	2.8	2.9
Population growth	1.2	1.0	0.4	0.3	1.2	0.2	1.2
Per person real growth	3.4	2.8	3.2	3.8	2.7	2.6	1.6

— Nil or rounded to zero.

(a) Australian and New Zealand data relate to the year commencing 1 July; data for France relates to the calendar year indicated; data for Canada, Japan and the United Kingdom relate to the year commencing 1 April; United States data relate to the year ending 30 September.

(b) Japan to 1997.

(c) New Zealand to 1995.

(d) UK to 1996.

(e) Excess health inflation rate is the rate by which changes in the prices of health services exceed changes in prices throughout the general community. A positive excess health inflation rate indicates that health prices are rising faster than the general rate of inflation; a negative rate indicates that health prices are falling or not rising as fast as the general rate of inflation.

Sources: AIHW Health Expenditure Database; OECD 2003.

Table S54: Contributions income and direct health expenditure by private health insurance funds, Australia, constant prices[(a)], 1984–85 to 2001–02 ($ million)

Year	Contributions income ($ million)	Annual growth rate (%)	Benefits ($ million)	Annual growth rate (%)
1984–85	2,606	. .	2,154	. .
1985–86	2,821	8.2	2,505	16.3
1986–87	3,231	14.5	2,905	16.0
1987–88	3,531	9.3	3,157	8.7
1988–89	3,550	0.5	3,208	1.6
1989–90	3,661	3.1	3,377	5.3
1990–91	4,007	9.4	3,720	10.1
1991–92	4,498	12.3	3,945	6.1
1992–93	4,697	4.4	4,094	3.8
1993–94	4,736	0.8	4,140	1.1
1994–95	4,664	–1.5	4,178	0.9
1995–96	4,655	–0.2	4,320	3.4
1996–97	4,777	2.6	4,523	4.7
1997–98	5,046	5.6	4,432	–2.0
1998–99	5,264	4.3	4,540	2.4
1999–00	5,714	8.6	4,673	2.9
2000–01	7,132	24.8	5,347	14.4
2001–02	7,088	–0.6	6,164	15.3
Average annual growth rates				
1984–85 to 2002–03		6.5		5.8
1997–98 to 2001–02		8.0		10.5
1991–92 to 2000–01		6.2		4.3
1991–92 to 2001–02		10.5		4.3

Sources: Private Health Insurance Administration Council, annual reports.

Table S55: Net assets of registered health benefit funds, current prices, 1991–92 to 2002–03 ($ million)

Year	Net assets
1991–92	991.3
1992–93	1,205.4
1993–94	1,350.1
1994–95	1,409.0
1995–96	1,295.3
1996–97	1,173.5
1997–98	1,173.1
1998–99	1,304.4
1999–00	1,661.8
2000–01	2,387.0
2001–02	2,213.4
2002–03	2,325.1

Source: PHIAC 2002.

Table S56: Expenditure on health services funded through health insurance, by area of expenditure and contributions income of health insurance funds, current prices, 1999–00 to 2001–02 ($ million)

	1999–00				2000–01				2001–02			
		Premium rebates				Premium rebates				Premium rebates		
Area of expenditure	Gross benefits paid	Direct[a]	Taxation	Net benefits paid	Gross benefits paid	Direct[b]	Taxation	Net benefits paid	Gross benefits paid	Direct[b]	Taxation	Net benefits paid
Expenditure												
Hospitals	2,900	774	105	2,021	3,312	1,087	—	2,225	3,783	1,139	—	2,643
Public (non-psychiatric)	287	77	10	200	322	106	—	216	375	113	—	262
Private	2,612	698	94	1,821	2,990	981	—	2,009	3,407	1,026	—	2,381
Ambulance[c]	136	36	5	95	181	59	—	121	189	57	—	132
Medical services	281	75	10	196	427	140	—	287	598	180	—	418
Other health professionals	262	70	9	183	333	109	—	224	420	126	—	293
Pharmaceuticals	43	12	2	30	53	17	—	36	64	19	—	44
Aids and appliances	210	56	8	146	268	88	—	180	318	96	—	223
Community/public health	1	—	—	—	1	—	—	—	1	—	—	—
Dental services	636	170	23	443	774	254	—	520	946	285	—	661
Total health	**4,469**	**1,193**	**161**	**3,115**	**5,348**	**1,755**	**—**	**3,594**	**6,318**	**1,903**	**—**	**4,415**
Health administration	717	191	26	500	843	277	—	566	718	207	—	511
Direct expenditure	5,186	1,385	187	3,614	6,191	2,031	—	4,160	7,036	2,110	—	4,926
Outstanding claims	91	24	3	63	220	66	—	154	42	12	—	30
Non-health ancillaries	17	5	1	12	27	8	—	19	72	20	—	52
Total expenditure	**5,294**	**1,414**	**195**	**3,685**	**6,438**	**2,105**	**—**	**4,333**	**7,150**	**2,142**	**—**	**5,008**
Revenue												
Contributions income[d]				3,853				5,202				5,288
Other revenue				214				226				66
Total revenue				**4,067**				**5,428**				**5,354**
Operating profit/loss before abnormals and extraordinary items				381				852				–32

(a) Amounts paid by the Commonwealth to the health insurance funds to compensate them for revenue forgone due to reduction in premiums. Does not include rebates claimed through the taxation system.
(b) Includes $175m in 2000–01 and $161m in 2001–02 by the Australian Taxation Office as rebates claimed through the taxation system, now classified as an expense item, not a revenue item.
(b) Includes state government levies.
(c) Contributions income has been adjusted to remove the Commonwealth's 30% rebate to private health insurance policy holders. This has been done to show the contributions income that relates only to the expenditures funded out of the premiums and other incomes generated by the funds themselves.

Note: Some components may not add to totals due to rounding.

Source: AIHW Health Expenditure Database.

Health labour force

Table S57: Employment in the health industry, August 1983 to August 2003

Year	Employed in health industry ('000)	All employed persons ('000)	Proportion of all employed persons (%)	Civilian labour force[(a)] ('000)	Proportion of civilian labour force[(a)] (%)
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
1992	575.3	7,679.3	7.5	8,585.7	6.7
1993	561.4	7,621.0	7.4	8,537.0	6.6
1994	547.2	7,885.7	6.9	8,683.5	6.3
1995	591.9	8,217.7	7.2	8,939.6	6.6
1996	590.2	8,319.7	7.1	9,090.8	6.5
1997	610.2	8,315.5	7.3	9,080.1	6.7
1998	598.7	8,535.9	7.0	9,261.5	6.5
1999	600.4	8,731.6	6.9	9,384.4	6.4
2000	656.9	9,048.4	7.3	9,649.7	6.8
2001	669.2	9,124.2	7.3	9,768.2	6.9
2002	703.9	9,310.1	7.6	9,906.1	7.1
2003	690.4	9,472.4	7.3	10,035.9	6.9
1993 to 2003 increase (%)	**23.0**	**24.3**		**17.6**	

(a) Includes unemployed persons looking for work.

Sources: ABS Cat. Nos. 6203.0 & 6291.0.55.001.

Table S58: Persons employed in health occupations: occupation by hours worked, 2001

	Hours worked (per cent)					
Occupation	**1–34**	**35–40**	**41–48**	**49+**	**Total**	**Number**
Medical workers						
Medical administrator	13.8	40.0	17.0	29.2	100.0	3,730
Generalist medical practitioner	22.7	20.2	12.9	44.1	100.0	29,126
Medical practitioner-in-training	8.3	22.1	16.7	52.9	100.0	2,746
Specialist medical practitioner	15.5	17.3	12.1	55.1	100.0	15,878
Other	16.0	26.2	12.8	45.0	100.0	326
Total	*19.1*	*20.9*	*13.2*	*46.8*	*100.0*	*51,806*
Medical imaging workers	30.2	48.4	13.1	8.3	100.0	8,111
Dental workers						
Dentist	24.4	40.4	17.2	17.9	100.0	7,382
Dental assistant	43.6	44.1	9.7	2.7	100.0	13,085
Other	28.4	39.9	10.3	21.3	100.0	5,395
Total	*34.9*	*42.1*	*12.0*	*11.0*	*100.0*	*25,862*
Nursing workers						
Director of nursing/nurse manager	18.3	43.3	16.4	22.0	100.0	10,077
Registered nurse	50.4	37.8	5.9	6.0	100.0	142,184
Registered midwife	62.8	29.0	4.3	3.8	100.0	11,652
Mental health nurse & disability nurse	28.2	55.8	7.9	8.1	100.0	7,091
Enrolled nurse	53.0	37.6	4.5	4.8	100.0	19,507
Personal care assistant	58.6	33.0	3.5	4.9	100.0	27,884
Nursing assistant	61.2	29.9	3.2	5.6	100.0	22,786
Other	37.8	40.0	11.5	10.7	100.0	3,275
Total	*50.9*	*36.9*	*5.8*	*6.4*	*100.0*	*244,456*
Pharmacy workers						
Retail pharmacist	30.7	24.3	17.9	27.1	100.0	12,042
Other	26.4	42.5	20.2	10.9	100.0	1,857
Total	*30.2*	*26.7*	*18.2*	*25.0*	*100.0*	*13,899*

(continued)

Table S58 (continued): Persons employed in health occupations: occupation by hours worked, 2001

	Hours worked (per cent)					
Occupation	**1–34**	**35–40**	**41–48**	**49+**	**Total**	**Number**
Allied health workers						
Occupational therapist	38.9	42.9	11.7	6.5	100.0	5,331
Optometrist	24.5	32.8	23.7	19.0	100.0	2,695
Physiotherapist	40.9	32.2	11.9	15.0	100.0	10,242
Speech pathologist	43.6	36.1	13.0	7.2	100.0	3,011
Clinical psychologist	37.8	35.7	11.3	15.2	100.0	7,572
Therapy aide	71.7	23.4	2.8	2.2	100.0	2,721
Other	45.5	34.7	9.5	10.3	100.0	7,885
Total	*42.1*	*34.5*	*11.5*	*11.8*	*100.0*	*39,457*
Complementary therapies						
Chiropractor	38.4	30.7	12.0	18.8	100.0	2,063
Naturopath	56.3	22.2	8.2	13.2	100.0	2,510
Other	63.7	18.1	7.1	11.1	100.0	3,960
Total	*55.4*	*22.4*	*8.6*	*13.6*	*100.0*	*8,533*
Other health workers						
Medical scientist	22.5	48.3	15.0	14.2	100.0	11,104
Medical technical officer	37.7	46.8	9.5	6.1	100.0	13,945
Other	37.7	46.8	9.5	6.1	100.0	25,049
Total	*29.0*	*43.6*	*14.0*	*13.4*	*100.0*	*58,567*
Total	41.7	35.6	9.2	13.6	100.0	450,691

Note: Components may not add to totals due to rounding.

Source: AIHW & ABS 2003.

Table S59: Indigenous persons employed in health occupations, 1996 and 2001

	1996		2001	
Occupation	**Number**	**% of labour force**	**Number**	**% of labour force**
Medical workers				
Medical administrator	21	1.1	61	1.6
Generalist medical practitioner[(a)]	29	0.1	48	0.2
Medical practitioner-in-training	12	0.5	10	0.4
Specialist medical practitioner	20	0.1	32	0.3
Total	*82*	*0.2*	*151*	*0.3*
Medical imaging workers	7	0.1	14	0.2
Dental workers				
Dental assistant	117	1.0	125	1.0
Other	30	0.2	30	0.3
Total	*147*	*0.6*	*155*	*0.6*
Nursing workers				
Registered nurse	609	0.5	789	0.6
Enrolled nurse	564	2.3	202	1.0
Personal care assistant	224	1.3	396	1.4
Nursing assistant	345	1.3	397	1.7
Other	85	0.3	132	0.4
Total	*1,827*	*0.8*	*1,916*	*0.8*
Pharmacy workers	6	—	10	0.1
Allied health workers	71	0.2	133	0.3
Complementary therapies	18	0.3	24	0.3
Other health				
Environmental health officer	122	2.4	114	3.5
Indigenous health worker	667	94.5	853	93.2
Other	231	0.5	372	0.7
Total	*1,020*	*2.5*	*1,339*	*2.1*
Total	**3,178**	**0.8**	**3,742**	**0.9**

— Nil or rounded to zero.

(a) Includes four medical practitioners not further defined in 2001.

Notes

1. Does not include 2,136 health workers in 1996 and 2,182 in 2001 who did not state whether or not they were Indigenous.
2. Components may not add to totals due to rounding.

Source: AIHW 2001b; AIHW & ABS 2003.

Use of professional services

Table S60: Medical and optometrical services, fees and benefits under Medicare, 1996–97 to 2002–03

Year	Number of services (million)	Fees charged ($ million)	Schedule fees ($ million)	Benefits paid ($million)
GP attendances				
1996–97	102.5	2,517.8	2,752.6	2,339.7
1997–98	103.1	2,564.5	2,786.6	2,367.8
1998–99	102.6	2,605.0	2,818.6	2,395.4
1999–00	101.5	2,675.3	2,884.3	2,452.3
2000–01	100.6	2,811.0	3,014.2	2,561.1
2001–02	99.9	3,037.0	3,226.4	2,742.2
2002–03	96.9	3,150.8	3,255.0	2,766.2
Specialist attendances				
1996–97	18.2	1,108.6	1,066.1	897.3
1997–98	18.2	1,132.3	1,078.3	907.0
1998–99	18.6	1,183.3	1,119.2	941.3
1999–00	18.9	1,231.4	1,152.8	969.2
2000–01	19.3	1,303.8	1,197.5	1,005.3
2001–02	19.8	1,381.5	1,238.1	1,038.4
2002–03	20.1	1,482.9	1,285.0	1,076.6
Obstetrics				
1996–97	1.6	98.9	70.7	56.8
1997–98	1.6	97.4	68.2	54.9
1998–99	1.6	101.3	71.9	57.7
1999–00	1.5	106.3	75.2	60.0
2000–01	1.5	120.1	78.5	62.5
2001–02	1.5	145.5	88.8	70.5
2002–03	1.4	159.1	90.9	72.1
Anaesthetics				
1996–97	1.7	218.7	166.1	125.8
1997–98	1.7	225.4	169.1	128.0
1998–99	1.8	235.3	175.7	133.0
1999–00	1.8	249.8	182.4	138.2
2000–01	2.1	294.7	206.6	156.4
2001–02	2.0	369.7	248.0	187.4
2002–03	1.9	430.5	273.0	206.2
Pathology				
1996–97	50.3	945.3	1,020.2	857.8
1997–98	52.4	1,014.5	1,099.6	924.2
1998–99	55.6	1,096.3	1,199.0	1,008.4
1999–00	58.8	1,173.9	1,292.7	1,087.6
2000–01	62.1	1,246.7	1,375.6	1,156.8
2001–02	68.0	1,354.8	1,492.4	1,254.1
2002–03	70.5	1,422.5	1,562.2	1,312.0

(continued)

Table S60 (continued): Medical and optometrical services, fees and benefits under Medicare, 1996–97 to 2002–03

Year	Number of services (million)	Fees charged ($ million)	Schedule fees ($ million)	Benefits paid ($million)
Diagnostic imaging				
1996–97	10.4	987.9	1,025.6	876.4
1997–98	10.8	1,059.2	1,100.9	934.2
1998–99	11.4	1,199.9	1,250.9	1,064.7
1999–00	11.7	1,257.5	1,296.7	1,105.0
2000–01	12.3	1,346.8	1,361.2	1,159.5
2001–02	12.8	1,432.0	1,429.6	1,216.9
2002–03	13.2	1,523.7	1,502.6	1,278.2
Operations				
1996–97	5.4	841.1	736.1	582.0
1997–98	5.4	861.2	744.6	587.1
1998–99	5.5	897.8	770.4	607.7
1999–00	5.6	951.1	803.7	634.2
2000–01	5.8	1,074.5	875.7	688.7
2001–02	6.1	1,214.2	951.8	746.5
2002–03	6.3	1,327.4	1,010.5	792.5
Optometry				
1996–97	3.7	147.3	172.0	146.2
1997–98	3.8	144.2	167.8	142.7
1998–99	3.9	147.9	171.7	146.1
1999–00	4.1	156.8	182.3	155.1
2000–01	4.2	164.6	191.5	162.9
2001–02	4.4	173.6	202.2	171.9
2002–03	4.6	184.1	214.4	182.3
All other services[(a)]				
1996–97	5.0	343.5	330.1	275.9
1997–98	5.2	361.9	345.1	287.6
1998–99	5.5	394.8	377.7	314.9
1999–00	5.6	429.4	410.9	343.5
2000–01	5.9	476.0	447.3	373.6
2001–02	6.2	520.3	481.1	401.8
2002–03	6.4	564.6	513.6	429.4
Total services				
1996–97	198.8	7,209.1	7,339.5	6,158.0
1997–98	202.2	7,460.7	7,560.1	6,333.5
1998–99	206.3	7,861.8	7,955.2	6,669.1
1999–00	209.6	8,231.4	8,281.0	6,945.0
2000–01	213.9	8,838.0	8,748.1	7,326.8
2001–02	220.7	9,628.7	9,358.5	7,829.5
2002–03	221.4	10,245.6	9,707.2	8,115.5

(a) Includes radiotherapy and nuclear medicine therapy, assistance at operations and other miscellaneous services.

Source: DoHA 2003.

Table S61: Medicare services, age-specific rates, 1985–86 to 2002–03 (services per person)

Sex/age group	1985–86	1990–91	1995–96	2000–01	2001–02	2002–03
Males						
0–4	7.49	8.49	9.74	8.79	8.48	8.34
5–9	4.32	4.76	5.28	4.59	4.60	4.33
10–14	3.63	3.98	4.51	4.16	4.16	3.89
15–19	3.55	4.22	4.80	4.60	4.50	4.28
20–24	4.03	4.37	5.11	4.75	4.88	4.58
25–34	4.42	4.88	5.91	5.53	5.59	5.39
35–44	5.09	5.72	7.12	7.17	7.23	7.04
45–54	6.94	7.39	9.50	9.78	10.01	9.89
55–64	8.90	10.98	14.38	14.83	14.93	14.84
65–74	10.53	11.47	18.21	22.94	23.26	23.46
75+	14.60	16.43	20.89	19.80	20.79	22.02
Crude rate	**5.90**	**6.72**	**8.63**	**8.95**	**9.15**	**9.11**
ASR[(a)]	**6.35**	**7.13**	**9.06**	**9.18**	**9.30**	**9.22**
Females						
0–4	6.77	7.71	8.91	8.02	7.75	7.59
5–9	4.25	4.73	5.24	4.57	4.57	4.30
10–14	3.80	4.17	4.65	4.24	4.20	3.97
15–19	6.36	7.31	8.58	8.05	7.95	7.61
20–24	9.71	9.70	11.74	10.54	10.86	10.26
25–34	10.50	10.89	13.45	12.98	13.07	12.78
35–44	8.85	9.81	12.25	12.35	12.33	12.16
45–54	10.04	11.19	14.13	14.46	14.52	14.29
55–64	11.42	13.03	16.67	17.88	17.82	18.03
65–74	14.08	15.50	19.88	22.76	23.24	23.53
75+	17.27	19.33	24.26	25.38	25.44	25.83
Crude rate	**9.25**	**10.24**	**12.78**	**13.10**	**13.20**	**13.11**
ASR[(a)]	**9.41**	**10.33**	**12.78**	**12.90**	**12.94**	**12.79**

(a) Age-standardised rate. Age-standardised to the Australian population as at 30 June 2001.

Sources: HIC 1986, 1996, 2001, 2003.

Table S62: Medicare services, age-specific rates, states and territories, 2002–03 (services per person)

Sex/age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Males									
0–4	8.96	8.44	8.19	7.38	8.31	6.56	6.69	5.00	8.34
5–9	4.71	4.60	4.03	3.70	4.11	3.73	3.30	2.39	4.33
10–14	4.18	4.02	3.71	3.54	3.68	3.48	3.28	1.97	3.89
15–19	4.58	4.37	4.03	3.94	4.35	4.07	3.63	2.40	4.28
20–24	5.04	4.65	4.22	3.93	4.77	4.46	3.53	2.37	4.58
25–34	5.85	5.50	5.01	4.74	5.49	5.27	4.35	3.08	5.39
35–44	7.73	7.02	6.69	6.21	6.94	6.25	5.62	4.63	7.04
45–54	10.73	9.64	9.79	8.95	9.54	8.74	8.48	7.26	9.89
55–64	16.10	14.59	14.57	13.32	14.15	13.40	12.56	10.15	14.84
65–74	25.05	23.51	22.86	21.05	22.39	21.13	20.23	14.86	23.46
75+	22.67	22.96	21.00	21.14	21.60	17.59	19.03	13.84	22.02
Crude rate	**9.87**	**9.18**	**8.70**	**7.99**	**9.21**	**8.37**	**7.04**	**4.84**	**9.11**
ASR[(a)]	**9.91**	**9.28**	**8.89**	**8.31**	**8.99**	**8.16**	**7.71**	**5.88**	**9.22**
Females									
0–4	8.21	7.57	7.56	6.72	7.57	6.02	6.16	4.22	7.59
5–9	4.61	4.57	4.03	3.75	4.17	3.71	3.34	2.42	4.30
10–14	4.14	4.14	3.80	3.72	3.86	3.74	3.44	2.34	3.97
15–19	7.80	7.35	7.78	7.61	7.62	8.03	6.46	5.79	7.61
20–24	10.95	9.87	10.07	9.93	10.11	11.01	8.33	8.02	10.26
25–34	13.31	13.01	12.11	12.67	12.47	12.13	11.41	9.33	12.78
35–44	12.78	12.26	11.70	11.74	11.79	11.34	10.64	9.05	12.16
45–54	15.01	14.14	14.23	13.58	13.85	13.54	12.43	10.60	14.29
55–64	19.07	17.72	17.98	16.71	17.57	16.99	15.54	12.72	18.03
65–74	24.78	23.17	23.67	21.53	22.60	21.31	21.59	15.96	23.53
75+	26.06	26.68	25.85	24.31	25.29	23.04	23.05	17.08	25.83
Crude rate	**13.80**	**13.23**	**12.69**	**12.17**	**13.22**	**12.45**	**10.92**	**7.96**	**13.11**
ASR[(a)]	**13.39**	**12.80**	**12.59**	**12.13**	**12.46**	**11.98**	**11.17**	**9.04**	**12.79**

(a) Age-standardised rate. Age-standardised to the Australian population as at 30 June 2001.

Source: HIC 2003.

Table S63: Medicare services, percentage of enrolled persons by number of items, 2001–02

Sex/age group	Number of services					
	0	1	2	3	4	5 or more
Males						
0–4	9.67	7.97	8.39	8.37	7.86	57.74
5–9	17.67	14.23	12.40	10.32	8.36	37.02
10–14	22.33	15.53	12.72	10.06	7.92	31.44
15–19	23.26	15.28	11.86	9.14	7.17	33.29
20–24	27.59	13.99	10.39	7.93	6.39	33.71
25–34	32.17	12.95	9.30	6.99	5.65	32.94
35–44	26.02	11.70	8.47	6.46	5.44	41.91
45–54	18.70	9.74	7.03	5.50	4.79	54.24
55–64	14.06	5.97	4.63	3.83	3.65	67.86
65–74	12.60	2.75	2.45	2.23	2.24	77.73
75+	37.11	2.88	2.34	1.80	1.94	53.93
All ages	**22.62**	**10.57**	**8.19**	**6.52**	**5.50**	**46.60**
Females						
0–4	10.66	8.95	9.16	8.85	8.26	54.12
5–9	18.06	14.56	12.51	10.25	8.35	36.27
10–14	22.51	15.99	12.85	10.11	7.82	30.72
15–19	14.32	10.86	9.76	8.20	6.89	49.97
20–24	13.17	6.42	6.14	5.90	5.64	62.73
25–34	17.06	5.63	5.06	4.95	4.80	62.50
35–44	14.05	6.34	5.34	5.33	5.13	63.81
45–54	10.03	5.32	4.50	4.39	4.32	71.44
55–64	8.82	3.54	3.21	3.19	3.26	77.98
65–74	11.22	2.12	2.06	2.06	2.19	80.35
75+	26.71	1.59	1.59	1.51	1.70	66.90
All ages	**14.92**	**6.74**	**5.95**	**5.45**	**5.02**	**61.92**

Source: HIC 2003.

National Health Priority Areas

Table S64: Indicators for cardiovascular health

Descriptor	Baseline		Most recent data	
	Year	Value	Year	Value
Incidence rate for myocardial infarction, ages 30–79[(a)] (events per 100,000 population)				
Males	1993–94	786	2001–02	597
Females	1993–94	380	2001–02	286
Hospital separation rate for principal diagnosis of unstable angina pectoris, ages 0–79 (per 100,000 population)				
Males	1993–94	198	2001–02	308
Females	1993–94	111	2001–02	152
Hospital separation rate for principal diagnosis of congestive heart failure, ages 0–79 (per 100,000 population)				
Males	1993–94	113	2001–02	95
Females	1993–94	70	2001–02	57
Death rate for coronary heart disease, ages 0–79 (per 100,000 population)[(a)]				
Males	1986	226	2002	86
Females	1986	99	2002	34
Death rate for coronary heart disease among rural and remote area residents, ages 0–79 (per 100,000 population)[(b)]				
Males, major cities	1997–1999	109	2000–2002	87
Males, regional	1997–1999	123	2000–2002	98
Males, remote	1997–1999	152	2000–2002	119
Females, major cities	1997–1999	44	2000–2002	35
Females, regional	1997–1999	51	2000–2002	40
Females, remote	1997–1999	67	2000–2002	56
Prevalence rate for people whose main/underlying disabling condition is stroke, ages 25 or more (per 100,000 population)				
Males	1993	Not reported	1998	540
Females	1993	Not reported	1998	558
Death rate for stroke, ages 0–79 (per 100,000 population)[(a)]				
Males	1986	51	2002	24
Females	1986	40	2002	18

(continued)

Table S64 (continued): Indicators for cardiovascular health

Descriptor	Baseline		Most recent data	
	Year	Value	Year	Value
Death rate for stroke among rural and remote area residents, ages 0–79 (per 100,000 population)[(b)]				
Males, major cities	1997–1999	29	2000–2002	25
Males, regional	1997–1999	31	2000–2002	26
Males, remote	1997–1999	40	2000–2002	27
Females, major cities	1997–1999	21	2000–2002	18
Females, regional	1997–1999	23	2000–2002	19
Females, remote	1997–1999	27	2000–2002	21
Hospital separation rate for major amputation for peripheral vascular disease, ages 0–79 (per 100,000 population)				
Males	1993–94	2	2001–02	3
Females	1993–94	1	2001–02	1
Hospital separation rate for emergency and elective surgery for abdominal aortic aneurysm, ages 0–79 (per 100,000 population)				
Males	1993–94	21	2001–02	15
Females	1993–94	4	2001–02	3

(a) Comparability factor applied to enable comparison between ICD-9 (baseline) and ICD-10 (most recent) code data.

(b) ASGC remote classification aggregated to three categories: major cities, regional and remote.

Note: Rates are age-standardised to the 30 June 2001 Australian population.

Sources: AIHW National Mortality Database; AIHW National Hospital Morbidity Database; AIHW analysis of ABS 1998 Disability, Ageing & Carers Survey.

Table S65: Indicators for health risk factors

Descriptor	Baseline		Most recent data	
	Year	Value	Year	Value
Proportion of adults who smoke regularly, ages 18 or more (per cent)				
Males	1991	28	2001	22
Females	1991	23	2001	18
Proportion of secondary school students who smoke, age 15 (per cent)				
Males	1984	29	1999	21
Females	1984	34	1999	24
Proportion of adults not engaged in sufficient physical activity[(a)] to confer a health benefit, ages 18–75 (per cent)				
Males	1997	49	2000	54
Females	1997	50	2000	55
Proportion of adults who are overweight[(b) (c)], ages 25–64 (per cent)				
Males	1980	47	1999–2000	66
Females	1980	27	1999–2000	46
Proportion of adults with high blood pressure[(c) (d)], ages 25–64 (per cent)				
Males	1980	47	1999–2000	21
Females	1980	32	1999–2000	16
Mean blood pressure levels (mm Hg)[(c)], ages 25–64				
Males, systolic BP	1980	134	1999–2000	128
Males, diastolic BP	1980	85	1999–2000	74
Females, systolic BP	1980	127	1999–2000	121
Females, diastolic BP	1980	79	1999–2000	68
Proportion of adults with high blood cholesterol[(c) (e)], ages 25–64 (per cent)				
Males	1980	51	1999–2000	49
Females	1980	43	1999–2000	46
Contribution of saturated fat as a proportion of total energy intake, ages 25–64 (per cent)				
Males	1995	13	n.a.	n.a.
Females	1995	13	n.a.	n.a.

n.a. Not available.

(a) Sufficient physical activity to obtain a health benefit is at least 150 minutes accrued over at least 5 sessions per week.

(b) Overweight is a body mass index ≥ 25.

(c) Estimates are for people living in capital cities only.

(d) High blood pressure is systolic blood pressure ≥ 140mmHg or diastolic blood pressure ≥ 90mmHg or taking anti-hypertensive medication.

(e) High blood cholesterol is a level of 5.5 mmol/L or more.

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

Sources: AIHW analysis of 1980 NHF Risk Factor Prevalence Survey; 1995 ABS National Nutrition Survey; 1997 and 2000 National Physical Activity Surveys; 1999–2000 Australian Diabetes, Obesity and Lifestyle (AusDiab) Study; 2001 National Drug Strategy Household Survey; DHAC & AIHW 1999a; Hill et al. 1987; Hill, White & Effendi 2002.

Table S66: Indicators for cancer control

Descriptor	Baseline		Most recent data	
	Year	Value	Year	Value
Incidence of cervical cancer among women aged 20–74 years (new cases per 100,000 population)				
Females	1988	18	2000	10
Death rate for cervical cancer among women aged 20–74 years (deaths per 100,000 population)[a]				
Females	1991	4	2002	2
Five-year relative survival proportions for cervical cancer (per cent)				
Females	1982–1986	53	1992–1997	58[b]
Proportion of females aged 20–69 years screened within intervals for cervical cancer (per cent)				
Females	1996–97	62	2000–01	62
Incidence of breast cancer among women aged 50–74 years (new cases per 100,000 population)				
Females	1988	202	2000	301
Death rate for breast cancer among women aged 50–74 years (deaths per 100,000 population)[a]				
Females	1992	67	2002	59
Five-year relative survival proportions for breast cancer (per cent)				
Females	1982–1986	71	1992–1997	83[b]
Proportion of females aged 50–69 years screened for breast cancer (per cent)				
Females	1996–97	51	2000–01	57
Incidence of prostate cancer (new cases per 100,000 population)				
Males	1988	71	2000	125
Death rate for prostate cancer (deaths per 100,000 population)[a]				
Males	1992	33	2002	35
Five-year relative survival proportions for prostate cancer (per cent)				
Males	1982–1986	57	1992–1997	82[b]
Incidence of colorectal cancer (new cases per 100,000 population)				
Males	1988	62	2000	80
Females	1988	43	2000	54
Death rate for colorectal cancer (deaths per 100,000 population)[a]				
Males	1992	29	2002	28
Females	1992	19	2002	20
Incidence of melanoma of the skin (new cases per 100,000 population)				
Males	1991	39	2000	54
Females	1991	31	2000	38

(continued)

Table S66 (continued): Indicators for cancer control

Descriptor	Baseline		Most recent data	
	Year	Value	Year	Value
Death rate for melanoma of the skin (deaths per 100,000 population)[(a)]				
Males	1991	6	2002	8
Females	1991	3	2002	3
Five-year relative survival proportions for melanoma of the skin (per cent)				
Males	1982–1986	81	1992–1997	88[(b)]
Females	1982–1986	86	1992–1997	92[(b)]
Incidence of non-melanocytic skin cancer (new cases per 100,000 population)				
Males	1990	1,187	n.a.	n.a.
Females	1990	769	n.a.	n.a.
Death rate for non-melanocytic skin cancer (deaths per 100,000 population)[(a)]				
Males	1991	3	2002	3
Females	1991	1	2002	1
Incidence of cancer of the trachea, bronchus and lung (new cases per 100,000 population)				
Males	1983	73	2000	62
Females	1983	16	2000	27
Death rate for cancer of the trachea, bronchus and lung (deaths per 100,000 population)[(a)]				
Males	1986	63	2002	53
Females	1983	16	2002	24

(a) Comparability factor applied to enable comparison between ICD-9 (baseline) and ICD-10 (most recent) coded data.

(b) These figures have been taken from *Cancer Survival in Australia 1992–1997* (Part 3) and are not comparable with those provided from the previous report because figures from Part 3 have been age adjusted. Usually age adjustment of Australian health data is the total Australia population. However, the age structure of the total population is very different to the age structure of people diagnosed with cancer. Instead the population consisting of all people diagnosed with cancer during the period 1992–1997 has been used as the standard population for age adjustment in this instance.

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

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

Table S67: Indicators for diabetes mellitus

Descriptor	Baseline		Most recent data	
	Year	Value	Year	Value
Prevalence rates for Type 1 and Type 2 diabetes in the general population, in the Indigenous population, and among persons from non-English-speaking backgrounds (NESB) (per 100,000 population)				
Self-reported diabetes, all ages				
Males, Type 1 diabetes, general population	1995	530	2001	528
Males, Type 2 diabetes, general population	1995	1,131	2001	2,356
Females, Type 1 diabetes, general population	1995	393	2001	483
Females, Type 2 diabetes, general population	1995	946	2001	2,269
Males, Type 2 diabetes, NESB[(a)]	1995	1,573	2001	3,331
Females, Type 2 diabetes, NESB[(a)]	1995	1,145	2001	2,942
Males, all diabetes, Indigenous population[(b) (c)]	1995	10	2001	8
Females, all diabetes, Indigenous population[(b) (c)]	1995	11	2001	14
Measured diabetes, ages 25 and over				
Males, Type 2 diabetes, general population	1999–2000	8,283	n.a.	n.a.
Females, Type 2 diabetes, general population	1999–2000	6,462	n.a.	n.a.
Incidence rates for Type 1 diabetes in the general population (per 100,000 population aged less than 15)				
Males, Type 1 diabetes, general population	2000	19	2002	21
Females, Type 1 diabetes, general population	2000	19	2002	21
Prevalence rates for obesity (BMI ≥ 30) and overweight (25 ≤ BMI <30) in the general population, and among persons with Type 2 diabetes (per 1,000 persons aged 25 and over)				
Males, Type 2 diabetes, overweight but not obese	1999–2000	327	n.a.	n.a.
Males, Type 2 diabetes, obese	1999–2000	556	n.a.	n.a.
Males, Type 2 diabetes, overweight	1999–2000	883	n.a.	n.a.
Females, Type 2 diabetes, overweight but not obese	1999–2000	264	n.a.	n.a.
Females, Type 2 diabetes, obese	1999–2000	546	n.a.	n.a.
Females, Type 2 diabetes, overweight	1999–2000	810	n.a.	n.a.
Males, general population, overweight but not obese	1999–2000	482	n.a.	n.a.
Males, general population, obese	1999–2000	191	n.a.	n.a.
Males, general population, overweight	1999–2000	673	n.a.	n.a.
Females, general population, overweight but not obese	1999–2000	298	n.a.	n.a.
Females, general population, obese	1999–2000	219	n.a.	n.a.
Females, general population, overweight	1999–2000	517	n.a.	n.a.
Rates for non-participation[(d)] in regular, sustained, moderate aerobic exercise in the general population, and among persons with Type 2 diabetes (per 1,000 persons aged 25 and over)				
Males, Type 2 diabetes, sedentary	1999–2000	187	n.a.	n.a.
Males, Type 2 diabetes, insufficient	1999–2000	488	n.a.	n.a.
Females, Type 2 diabetes, sedentary	1999–2000	144	n.a.	n.a.
Females, Type 2 diabetes, insufficient	1999–2000	536	n.a.	n.a.
Males, general population, sedentary	1999–2000	143	n.a.	n.a.
Males, general population, insufficient	1999–2000	414	n.a.	n.a.
Females, general population, sedentary	1999–2000	175	n.a.	n.a.
Females, general population, insufficient	1999–2000	475	n.a.	n.a.

(continued)

Table S67 (continued): Indicators for diabetes mellitus

Descriptor	Baseline		Most recent data	
	Year	Value	Year	Value
Prevalence rates for high blood pressure among persons with Type 2 diabetes, aged 25–59, 60 and over (per 1,000 persons)[(e)(f)]				
Males, aged 25–59 years	1999–2000	401	n.a.	n.a.
Males, aged 60 years and over	1999–2000	523	n.a.	n.a.
Females, aged 25–59 years	1999–2000	424	n.a.	n.a.
Females, aged 60 years and over	1999–2000	560	n.a.	n.a.
Prevalence rates for high levels of lipoproteins in the general population, and among persons with Type 1 and Type 2 diabetes (per 1,000 persons aged 25 and over)				
Males, Type 1 diabetes, high cholesterol (≥5.5 mmol/L)	1999–2000	n.a.	n.a.	n.a.
Males, Type 2 diabetes, high cholesterol (≥5.5 mmol/L)	1999–2000	525	n.a.	n.a.
Males, general population high cholesterol (≥5.5 mmol/L)	1999–2000	513	n.a.	n.a.
Males, Type 1 diabetes, low HDL (<1.0 mmol/L)	1999–2000	n.a.	n.a.	n.a.
Males, Type 2 diabetes, low HDL (<1.0 mmol/L)	1999–2000	459	n.a.	n.a.
Males, general population, low HDL (<1.0 mmol/L)	1999–2000	179	n.a.	n.a.
Females, Type 1 diabetes, high cholesterol (≥5.5 mmol/L)	1999–2000	n.a.	n.a.	n.a.
Females, Type 2 diabetes, high cholesterol (≥5.5 mmol/L)	1999–2000	673	n.a.	n.a.
Females, general population high cholesterol (≥5.5 mmol/L)	1999–2000	511	n.a.	n.a.
Females, Type 1 diabetes, low HDL (<1.0 mmol/L)	1999–2000	n.a.	n.a.	n.a.
Females, Type 2 diabetes, low HDL (<1.0 mmol/L)	1999–2000	213	n.a.	n.a.
Females, general population, low HDL (<1.0 mmol/L)	1999–2000	51	n.a.	n.a.
Prevalence rates for fasting hypertriglyceridaemia in the general population and among among persons with Type 1 and Type 2 diabetes (per 1,000 persons aged 25 and over)				
Males, Type 1 diabetes, fasting hypertriglyceridaemia (>4.0 mmo/L)	1999–2000	n.a.	n.a.	n.a.
Males, Type 2 diabetes, fasting hypertriglyceridaemia (>4.0 mmo/L)	1999–2000	178	n.a.	n.a.
Males, general population, fasting hypertriglyceridaemia (>4.0 mmol/L)	1999–2000	39	n.a.	n.a.
Females, Type 1 diabetes, fasting hypertriglyceridaemia (>4.0 mmol/L)	1999–2000	n.a.	n.a.	n.a.
Females, Type 2 diabetes, fasting hypertriglyceridaemia (>4.0 mmol/L)	1999–2000	60	n.a.	n.a.
Females, general population, fasting hypertriglyceridaemia (>4.0 mmol/L)	1999–2000	16	n.a.	n.a.

(continued)

Table S67 (continued): Indicators for diabetes mellitus

Descriptor	Baseline		Most recent data	
	Year	Value	Year	Value
Rate of new cases of persons with end-stage renal disease with diabetic nephropathy as a causal factor (per 1,000 persons aged 25–84 years)				
Total	1991	131	2001	268
Incidence rate for eye disease among clinically diagnosed people with diabetes, 18+ years (per 1,000 persons)				
Total	1999	12	2002	6
Prevalence rate for foot problems among clinically diagnosed persons with diabetes (per 1,000 persons)				
Current foot ulcers	1999	21	2002	17
Previous foot ulcers	1999	42	2002	38
Incidence rate for myocardial infarction or stroke among clinically diagnosed persons with diabetes (per 1,000 persons)				
Myocardial infarction	1999	16	2002	20
Stroke	1999	13	2002	13
Hospital separation rate for end-stage renal disease (ICD-9-CM 584–585, ICD-10-AM N17–N18) as the principal diagnosis with diabetes (ICD-9-CM 250, ICD-10-AM E10–E14) as an associated diagnosis (per 100,000 persons)[(j)]				
Males	1993–94	8	1998–99	17
Females	1993–94	7	1998–99	13
Hospital separation rate for coronary heart disease (ICD-9-CM 410–414, ICD-10-AM I20–I25) or stroke (ICD-9-CM 430–438, ICD-10-AM G45, G46 & I10–I69) as the principal diagnosis with diabetes as an associated diagnosis (per 100,000 persons)[(j)]				
Males	1993–94	176	1998–99	268
Females	1993–94	106	1998–99	152
Hospital separation rate for diabetes both as the principal diagnosis and as an associated diagnosis with conditions other than end-stage renal disease or coronary heart disease/stroke as the principal diagnoses (per 100,000 persons)[(j) (k) (l)]				
Males	1993–94	967	1998–99	1,775
Females	1993–94	784	1998–99	1,392
Death rates for diabetes (ICD-9 250, ICD-10 E10–E14) in the general population, in the Indigenous population, and among people from non-English-speaking backgrounds (NESB) (per 100,000 persons)				
Males, general population	1991	19	2002	21
Females, general population	1991	14	2002	13
Males, NESB[(a)]	1991	26	2001	24
Females, NESB[(a)]	1991	23	2001	19
Males, Indigenous population[(l)]	1998–2000	138	2001–2002	136
Females, Indigenous population[(l)]	1998–2000	169	2001–2002	159

(continued)

Table S67 (continued): Indicators for diabetes mellitus

Descriptor	Baseline		Most recent data	
	Year	Value	Year	Value
Death rates for coronary heart disease (ICD-9 410–414, ICD-10 I20–I25) and stroke (ICD-9 430–438, ICD-AM G45, G46 & I10–I69) as the underlying cause of death where diabetes (ICD-9 250, ICD-10 E10–E14) was an associated cause in the general population, and among people from non-English-speaking backgrounds (NESB) (per 100,000 persons)				
Coronary heart disease				
Males, general population	1997	19	2002	18
Females, general population	1997	12	2002	10
Males, NESB[(a)]	1997	25	2001	21
Females, NESB[(a)]	1997	15	2001	17
Stroke				
Males, general population	1997	6	2002	5
Females, general population	1997	4	2002	4
Males, NESB[(a)]	1997	6	2001	8
Females, NESB[(a)]	1997	6	2001	5
Self-assessed health status of persons with and without diabetes (per 1,000 persons aged 25 and over)				
Good, very good or excellent				
Males, with diabetes	1999–2000	700	n.a.	n.a.
Males, without diabetes	1999–2000	854	n.a.	n.a.
Females, with diabetes	1999–2000	717	n.a.	n.a.
Females, without diabetes	1999–2000	863	n.a.	n.a.
Fair or poor				
Males, with diabetes	1999–2000	300	n.a.	n.a.
Males, without diabetes	1999–2000	146	n.a.	n.a.
Females, with diabetes	1999–2000	283	n.a.	n.a.
Females, without diabetes	1999–2000	137	n.a.	n.a.

n.a. Not available.

(a) NESB is based on a country of birth other than Australia, New Zealand, United States, Canada, South Africa, United Kingdom or Ireland.

(b) Non-remote area only.

(c) Per 100 persons.

(d) Sedentary persons reported undertaking no leisure-time physical activity in the week prior to interview. Insufficient activity is defined as reporting some leisure-time physical activity, but less than 150 minutes in total, in the week prior to interview.

(e) For 25–59 year olds high blood pressure is defined as systolic ≥ 140 or diastolic ≥ 90 or on medication for high blood pressure.

(f) For 60+ year olds high blood pressure is defined as systolic ≥ 160 or diastolic ≥ 90 or on medication for high blood pressure.

(h) Estimates are not provided for people with Type 1 diabetes because of small sample sizes.

(i) Rates are for incidence of blindness.

(j) The latest data available for this service are for 1998–99 due to two changes in Australian Coding Standards (one from July 1999 and the other from July 2000) which affect hospital separation data for diabetes and its complications.

(k) Comparability factor applied to enable comparisons between ICD-9 (baseline) and ICD-10 (most recent) coded data.

(l) Mortality and population data are based on Queensland, Western Australia, South Australia & the Northern Territory.

Sources: AIHW National Mortality Database; AIHW National Hospital Morbidity Database; AIHW National Diabetes Register; AIHW analysis of 1999–2000 Australian Diabetes, Obesity and Lifestyle Study; 1995 National Health Survey, 1995 and 2001 National Nutrition Survey; 1994 National Aboriginal and Torres Strait Islander Survey; Disney 1992; Russ 2001; NADC National Diabetes Clinical Data Collection Project.

Table S68: Injury prevention and control indicators

Descriptor	Baseline		Most recent data	
	Year	Value	Year	Value
Death rate for injury and poisoning in total population (per 100,000 population)				
Persons	1992	44	2002	39
Hospital separation rate for injury and poisoning in the total population (per 100,000 population)				
Persons	1991–92	1,702	2001–02	2,370
Death rate ratio comparing the injury status of males and females				
Male:female	1992	2.5	2002	2.5
Death rate for road transport-related injury in the total population and among males aged 15–24 years (per 100,000 population)				
Total population	1992	12	2002	9
Males aged 15–24 years	1992	32	2002	25
Hospital separation rate for road transport-related injury in the total population and among males aged 15–24 years (per 100,000 population)				
Total population	1991–92	219	2001–02	238
Males aged 15–24 years	1991–92	613	2001–02	598
Death rate due to falls among people aged 65 years and over (per 100,000 population)[(a)]				
Persons aged 65 years and over	1992	48	2002	52
Hospital separation rate due to falls among people aged 65 years and over (per 100,000 population)				
Males aged 65–74 years	1991–92	678	2001–02	1,136
Males aged 75 years and over	1991–92	2,523	2001–02	4,778
Females aged 65–74 years	1991–92	1,232	2001–02	1,624
Females aged 75 years and over	1991–92	4,528	2001–02	7,379
Hospital separation rate due to falls among children aged 0–4 and 5–9 years (per 100,000 population)				
Children aged 0–4 years	1991–92	499	2001–02	594
Children aged 5–9 years	1991–92	663	2001–02	752
Death rate for homicide among people aged 20–39 years (per 100,000 population)				
Males	1992	3	2002	3
Females	1992	2	2002	2
Death rate for homicide among children aged 0–9 years (per 100,000 population)				
Children aged 0–9 years	1992	1	2002	1
Death rate for injury resulting from fire, burns and scalds among people aged 55 years and over (per 100,000 population)				
Persons aged 55 years and over	1992	3	2002	1

(continued)

Table S68 (continued): Injury prevention and control indicators

Descriptor	Baseline		Most recent data	
	Year	Value	Year	Value
Hospital separation rate for injury resulting from fire, burns and scalds among children aged 0–4 years (per 100,000 population)				
Boys	1991–92	167	2001–02	231
Girls	1991–92	127	2001–02	180
Hospital separation rate due to poisoning among children aged 0–4 years (per 100,000 population)				
Children aged 0–4 years	1991–92	301	2001–02	235
Death rate for drowning in the total population and among children aged 0–4 years (per 100,000 population)				
Total population	1992	2	2002	1
Children aged 0–4 years	1992	6	2002	3
Hospital separation rate for near drowning among children aged 0–4 years (per 100,000 population)				
Children aged 0–4 years	1991–92	30	2001–02	22
Incidence rate for persistent spinal cord injury from traumatic causes (per 100,000 population)				
Persons	1995–96	1	1999–00	1

(a) Accidental falls includes codes for: ICD-9 E880–E888; ICD-10 W000–W19 and X59 where there is an additional cause of fracture.

Notes

1. All indicators: case selection for most recent data is in terms of the ranges of ICD-10 External Cause Codes considered to be most comparable to the ranges of ICD-9 External Cause Codes in terms of which the indicators were originally defined.
2. All indicators based on hospital data: case inclusion and calculation follow the NHPA Report Injury Prevention and Control 1997. The values reflect numbers of separation events included in the Australian Hospital Morbidity Data collection. They should not be interpreted as valid measures of levels or trends in the population incidence of injury. Baseline values are for Australia except the Northern Territory, for which external cause codes were not available.
3. Age-standardised to the Australian population at 30 June 2001.

Sources: DHFS & AIHW 1998; AIHW National Mortality Database; AIHW National Hospital Morbidity Database; AIHW NISU unpublished data; AIHW: Cripps 2003.

Table S69: Indicators for mental health, focusing on depression

Descriptor	Baseline		Most recent data	
	Year	Value	Year	Value
Prevalence rate for depressive disorders (per 100,000 population)				
Males	1997	4	n.a.	n.a.
Females	1997	7	n.a.	n.a.
Prevalence rate for anxiety disorders (per 100,000 population)				
Males	1997	7	n.a.	n.a.
Females	1997	12	n.a.	n.a.
Hospital separation rate[(a)] for suicide and self-inflicted injury[(b)] among young adults aged 15–24 years, and older people aged 65 years and over (per 100,000 population)				
Males, aged 15–24 years	1993–94	141	2001–02	189
Females, aged 15–24 years	1993–94	236	2001–02	372
Males, aged 65 years and over	1993–94	39	2001–02	52
Females, aged 65 years and over	1993–94	30	2001–02	42
Death rate for suicide among young adults aged 15–24 years, and older people aged 65 years and over (per 100,000 population)[(c)]				
Males, aged 15–24 years	1986	21	2000	19
Females, aged 15–24 years	1986	5	2002	4
Males, aged 65 years and over	1986	31	2002	20
Females, aged 65 years and over	1986	7	2002	5
Death rate for suicide in urban, rural and remote among young adults aged 15–24 years and 65 years and over (per 100,000 population)[(a)]				
Males, 15–24 years, major cities	1997–1999	23	2000–2002	16
Males, 15–24 years, inner regional	1997–1999	33	2000–2002	23
Males, 15–24 years, outer regional	1997–1999	34	2000–2002	27
Males, 15–24 years, remote	1997–1999	56	2000–2002	49
Males, 15–24 years, very remote	1997–1999	82	2000–2002	87
Males, 65 years and over, major cities	1997–1999	26	2000–2002	19
Males, 65 years and over, inner regional	1997–1999	26	2000–2002	25
Males, 65 years and over, outer regional	1997–1999	32	2000–2002	30
Males, 65 years and over, remote	1997–1999	38	2000–2002	27
Males, 65 years and over, very remote	1997–1999	24	2000–2002	40
Females, 15–24 years, major cities	1997–1999	6	2000–2002	4
Females, 15–24 years, inner regional	1997–1999	7	2000–2002	6
Females, 15–24 years, outer regional	1997–1999	7	2000–2002	7
Females, 15–24 years, remote	1997–1999	7	2000–2002	16
Females, 15–24 years, very remote	1997–1999	10	2000–2002	16
Females, 65 years and over, major cities	1997–1999	6	2000–2002	6
Females, 65 years and over, inner regional	1997–1999	5	2000–2002	4
Females, 65 years and over, outer regional	1997–1999	5	2000–2002	3
Females, 65 years and over, remote	1997–1999	4	2000–2002	6
Females, 65 years and over, very remote	1997–1999	10	2000–2002	2

(a) Figures are age-standardised to the Australian population at 30 June 2001.

(b) Separations are included where an ICD-10-AM external cause of injury or poisoning was reported in the range X60–X84 or Y87.0.

(c) Comparability factor applied to enable comparisons between ICD-9 (baseline) and ICD-10 (most recent) coded data.

Sources: AIHW National Mortality Database; AIHW National Morbidity Database; DHAC & AIHW 1999b.

Table S70: Indicators for asthma

Descriptor	Baseline		Most recent data	
	Year	Value	Year	Value
Prevalence rate of ever having doctor-diagnosed asthma (per 100 population)				
Males aged 0–14 years	n.a.		2001	26.6
Males aged 15 years and over	n.a		2001	17.7
Females aged 0–14 years	n.a		2001	20.5
Females aged 15 years and over	n.a.		2001	21.4
Current prevalence rate of asthma (per 100 population)				
Males aged 0–14 years	n.a.		2001	15.1
Males aged 15 years and over	n.a		2001	9.4
Females aged 0–14 years	n.a		2001	11.5
Females aged 15 years and over	n.a.		2001	12.9
Hospital separation rate for principal diagnosis of asthma (per 100,000 population)*				
Males aged 0–4 years	1993–1994	1,944	2001–2002	1,285
Males aged 5–14 years	1993–1994	715	2001–2002	359
Males aged 15–34 years	1993–1994	124	2001–2002	94
Males aged 35–64 years	1993–1994	72	2001–2002	68
Males aged 65 years and over	1993–1994	190	2001–2002	109
All ages	1993–1994	315	2001–2002	201
Females aged 0–4years	1993–1994	1,064	2001–2002	723
Females aged 5–14 years	1993–1994	496	2001–2002	230
Females aged 15–34 years	1993–1994	255	2001–2002	163
Females aged 35–64 years	1993–1994	156	2001–2002	165
Females aged 65 years and over	1993–1994	230	2001–2002	221
All ages	1993–1994	301	2001–2002	217
Patient days for asthma (per 100,000 population)*				
Males aged 0–4years	1993–1994	3,964	2001–2002	2,009
Males aged 5–14 years	1993–1994	1,559	2001–2002	638
Males aged 15–34 years	1993–1994	314	2001–2002	192
Males aged 35–64 years	1993–1994	303	2001–2002	203
Males aged 65 years and over	1993–1994	1,315	2001–2002	500
All ages	1993–1994	630	2001–2002	417
Females aged 0–4years	1993–1994	2,179	2001–2002	1,177
Females aged 5–14 years	1993–1994	1,196	2001–2002	443
Females aged 15–34 years	1993–1994	695	2001–2002	373
Females aged 35–64 years	1993–1994	751	2001–2002	611
Females aged 65 years and over	1993–1994	1,841	2001–2002	1,248
All ages	1993–1994	947	2001–2002	637

(continued)

Table S70 (continued): Indicators for asthma

Descriptor	Baseline		Most recent data	
	Year	Value	Year	Value
Death rate for asthma, ages 5–34 (per 100,000 population)*				
Males	1986	1.5	2002	0.4
Females	1986	1.4	2002	0.4
Death rate for asthma, all age (per 100,000 population)*				
Males	1986	4.9	2002	1.9
Females	1986	4.0	2002	2.1
Average annual asthma-related general practice visits (per 100 population)				
Males aged 0–4years	n.a.		2000–2003	32.3
Males aged 5–14 years	n.a.		2000–2003	22.0
Males aged 15–34 years	n.a.		2000–2003	9.3
Males aged 35–64 years	n.a.		2000–2003	9.2
Males aged 65 years and over	n.a.		2000–2003	15.9
Females aged 0–4years	n.a.		2000–2003	22.1
Females aged 5–14 years	n.a.		2000–2003	17.6
Females aged 15–34 years	n.a.		2000–2003	13.7
Females aged 35–64 years	n.a.		2000–2003	15.5
Females aged 65 years and over	n.a.		2000–2003	22.4

* Age standardised to the Australian population at 2001.

n.a. Not available.

Source: AIHW National Mortality Database; AIHW National Hospital Morbidity Database; ABS National Health Survey 2001; BEACH Survey of General Practice.

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Methods and conventions

Methods

Details of methods used in particular sections of the report are included in the text and boxes, and in footnotes to figures and tables. Entries in columns of tables may not add to the totals shown, due to rounding.

Age standardisation has been used to facilitate the comparison of populations with differing age compositions, either different populations at one time or the same population at different times. The 2001 Australian population (ABS 2003) has been used as the standard population for all intra-Australia comparisons. The 1991 Australian population was used for these comparisons in prior editions of *Australia's Health* back to the 1996 edition; some statistics may thus differ slightly from those in previous editions.

The European and the World Standard Populations have been used for some international comparisons. Details of these standard populations are provided.

Table A4: Age composition of the Australian population at 30 June 2001, and of European and World Standard Populations

Age group (years)	Australia, 30 June 2001	European Std	World Std
0	253,031	1,600	2,400
1–4	1,029,326	6,400	9,600
5–9	1,351,664	7,000	10,000
10–14	1,353,177	7,000	9,000
15–19	1,352,745	7,000	9,000
20–24	1,302,412	7,000	8,000
25–29	1,407,081	7,000	8,000
30–34	1,466,615	7,000	6,000
35–39	1,492,204	7,000	6,000
40–44	1,479,257	7,000	6,000
45–49	1,358,594	7,000	6,000
50–54	1,300,777	7,000	5,000
55–59	1,008,799	6,000	4,000
60–64	822,024	5,000	4,000
65–69	682,513	4,000	3,000
70–74	638,380	3,000	2,000
75–79	519,356	2,000	1,000
80–84	330,050	1,000	500
85 and over	265,235	1,000	500
Total	19,413,240	100,000	100,000

Sources: ABS 2003; WHO 1996.

Within Australia, most regional comparisons are among states and territories. For within-state comparisons, Australian Bureau of Statistics sources use capital city statistical areas and the rest of each state. Definitions for regional comparisons from other sources are not consistent, and are stated at appropriate places in the text.

Average annual rates of change or growth rates have been calculated as geometric rates:

$$\text{Average rate of change} = ((P_n/P_o)^{1/N} - 1) \times 100$$

where P_n = value in later time period

P_o = value in earlier time period

N = number of years between the two time periods.

The classification of deaths follows the Tenth Revision of the International Classification of Diseases (WHO 1992). Diseases treated in hospitals and the procedures performed during a hospital stay are classified using the second edition of the International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification (ICD-10-AM) (NCCH 2000).

Symbols

$	Australian dollars, unless otherwise specified
$m	million dollars
–	nil or rounded to zero
%	per cent
g	gram
kg	kilogram
kJ	kilojoule
km^2	square kilometres
'000	thousands
m	million
mm	millimetre
mmHg	millimetres of mercury
mmol/L	millimoles per litre
n.a.	not available
. .	not applicable
nec	not elsewhere classified
nfd	no further definition
n.p.	not published by the data source
npr	not previously reported
ppm	parts per million
wk	week
>	more than
<	less than
≥	more than or equal to
≤	less than or equal to
*	value subject to sampling variability too high for most practical purposes and/or the relative standard error is 25% to 50%.
**	value subject to sampling variability too high for most practical purposes and/or the relative standard error is more than 50%.

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Abbreviations

AACR	Australasian Association of Cancer Registries
ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
ACE	angiotensin-converting enzyme
ACIR	Australian Childhood Immunisation Register
ACSQHC	Australian Council for Safety and Quality in Health Care
ADHD	attention-deficit hyperactivity disorder
AGPS	Australian Government Publishing Service
AHCA	Australian Health Care Agreements
AHIC	Australian Health Information Council
AHMAC	Australian Health Ministers' Advisory Council
AHMC	Australian Health Ministers' Conference
AIDS	acquired immune deficiency syndrome
AIHW	Australian Institute of Health and Welfare
ALOS	average length of stay
AMD	age-related macular degeneration
ANZDATA	Australia and New Zealand Dialysis and Transplant Registry
AR-DRG	Australian Refined Diagnosis Related Group
ARI	acute respiratory infection
ART	assisted reproductive technology
ASGC	Australian Standard Geographic Classification
ASHR	Australian Study of Health and Relationships
ASSADS	Australian Secondary Students Alcohol and Drugs Survey
ATSIHWIU	Aboriginal and Torres Strait Islander Health and Welfare Information Unit
AusDiab	Australian Diabetes, Obesity and Lifestyle Study
BEACH	Bettering the Evaluation and Care of Health
BMI	body mass index
BSE	bovine spongiform encephalopathy
CABG	coronary artery bypass grafting
CATI	computer-aided/assisted telephone interview
CATI TRG	National Computer Assisted Telephone Interview Technical Reference Group
CHD	coronary heart disease
CJD	Creutzfeldt-Jakob disease
COPD	chronic obstructive pulmonary disease
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DALY	disability-adjusted life year
DBP	diastolic blood pressure
DDD	defined daily dose
DEST	Australian Government Department of Education, Science and Training

DHAC	Commonwealth Department of Health and Aged Care
DHFS	Commonwealth Department of Health and Family Services
DHS	Department of Human Services (Victoria)
DMFT	decayed, missing or filled permanent teeth
dmft	decayed, missing or filled primary teeth
DoHA	Australian Government Department of Health and Ageing
DRG	diagnosis related group
DVA	Australian Government Department of Veterans' Affairs
ESRD	end-stage renal disease
GDP	gross domestic product
GIFT	gamete intra-fallopian transfer
GP	general practitioner
HALE	health-adjusted life expectancy
HCV	hepatitis C virus
HDL	high-density lipoprotein
HDSC	Health Data Standards Committee
Hib	*Haemophilus influenzae* type b
HIC	Health Insurance Commission
HIV	human immunodeficiency virus
HUS	haemolytic uraemic syndrome
ICD	International Classification of Diseases
ICD-10-AM	International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification
ICF	International Classification of Functioning, Disability and Health
ICPC	International Classification of Primary Care
ICSI	intra-cytoplasmic sperm injection
IFG	impaired fasting glucose
IGT	impaired glucose tolerance
IPD	invasive pneumococcal disease
IVF	in-vitro fertilisation
LDL	low-density lipoprotein
LE	life expectancy
MBS	Medicare Benefits Schedule
MMR	maternal mortality rate
MMR	measles, mumps and rubella
MND	motor neurone disease
MS	multiple sclerosis
MSIC	medically supervised injecting centre
NATSINWP	National Aboriginal and Torres Strait Islander Nutrition Working Party
NCCH	National Centre for Classification in Health
NCHECR	National Centre in HIV Epidemiology and Clinical Research
NCIRS	National Centre for Immunisation Research and Surveillance

NCSCH	National Cancer Statistics Clearing House
NDS	National Drug Strategy
NDSHS	National Drug Strategy Household Survey
NHDC	National Health Data Committee
NHDD	*National Health Data Dictionary*
NHFA	National Heart Foundation of Australia
NHIG	National Health Information Group
NHIMG	National Health Information Management Group
NHMRC	National Health and Medical Research Council
NHPA	National Health Priority Area
NHPAC	National Health Priorities Action Council
NHPC	National Health Performance Committee
NHS	National Health Survey
NMSC	non-melanoma skin cancer
NNDSS	National Notifiable Diseases Surveillance System
OATSIH	Office for Aboriginal and Torres Strait Islander Health
OECD	Organisation for Economic Co-operation and Development
Pap	Papanicolaou (cervical smear test)
PBS	Pharmaceutical Benefits Scheme
PCI	percuteneous coronary intervention
PEI	patient episode initiation
PHIAC	Private Health Insurance Administration Committee
PSA	prostate-specific antigen
RFE	reason for encounter
RPBS	Repatriation Pharmaceutical Benefits Scheme
RSE	relative standard error
RSV	respiratory syncytial virus
SAI	Standards Australia International
SARS	severe acute respiratory syndrome
SBP	systolic blood pressure
SCRCSSP	Steering Committee for the Review of Commonwealth/State Service Provision
SCRGSP	Steering Committee for the Review of Government Service Provision
SEIFA	Socio-Economic Indexes for Areas
SH&FPA	Sexual Health and Family Planning Australia
SHine	Sexual Health Information Networking and Education (South Australia)
SiC	Significant Caries Index
SIDS	sudden infant death syndrome
SIGNAL	Strategic Inter-Governmental Nutrition Alliance
SIMC	Statistical Information Management Committee
SLA	statistical local area
SLTEC	shiga-like toxin-producing *Escherichia coli*
SMR	standardised mortality ratio
SPP	Specific Purpose Payment

SPR	standardised prevalence ratio
STI	sexually transmitted infection
TAFE	technical and further education
TB	tuberculosis
TG	triglyceride
TSE	transmissible spongiform encephalopathy
UNODC	United Nations Office on Drugs and Crime
URTI	upper respiratory tract infection
vCJD	variant Creutzfeldt-Jakob disease
VTEC	verotoxigenic *Escherichia coli*
VVCS	Vietnam Veterans Counselling Service
WHO	World Health Organization
WHO-FIC	World Health Organization Family of International Classifications
WHO-ISH	World Health Organization–International Society of Hypertension
YLD	years lost due to disability
YLL	years of life lost (due to premature mortality)

Places

ACT	Australian Capital Territory
Aust	Australia
Can	Canada
Fra	France
Ger	Germany
Jpn	Japan
NSW	New South Wales
NT	Northern Territory
NZ	New Zealand
Qld	Queensland
SA	South Australia
Tas	Tasmania
UK	United Kingdom
USA	United States of America
USSR	former Union of Soviet Socialist Republics
Vic	Victoria
WA	Western Australia

Glossary

Aboriginal A person of Aboriginal descent who identifies as an Aboriginal and is accepted as such by the community in which he or she lives.

accommodation (of eye) How the eye automatically adjusts so it can focus at various distances, mainly by changing the shape of its lens.

acute coronary syndrome Describes acute *myocardial infarction (heart attack)* or *unstable angina* when they first present as a clinical emergency with chest pain or other features.

acute hospitals Public, Department of Veterans' Affairs (repatriation) and private hospitals which provide services primarily to admitted patients with acute or temporary ailments. The average length of stay is relatively short.

acute Coming on sharply and often brief, intense and severe.

addiction/addictive behaviour When a person shows a very high dependence on something that is harmful or dangerous to them. It is marked by repeated and compulsive activity which the person would or does find very difficult or impossible to stop. The term is most often applied to addictive drug use, such as with alcohol, tobacco or other drugs.

admission Admission to hospital. In this report, the number of separations has been taken as the number of admissions, hence an admission rate is the same as a separation rate.

admitted patient A patient who undergoes a hospital's formal admission process.

affective disorders Mood disorders such as *depression*, *mania* and *bipolar affective disorder*. (The term does not include *anxiety disorders*, which are classified as a separate group.)

age standardisation A method of removing the influence of age when comparing populations with different age structures. This is usually necessary because the rates of many diseases vary strongly (usually increasing) with age. The age structures of the different populations are converted to the same 'standard' structure, then the disease rates that would have occurred with that structure are calculated and compared.

age-specific rate A rate for a specific age group. The numerator and denominator relate to the same age group.

Alzheimer's disease Condition marked by progressive loss of brainpower shown by worsening short-term memory, confusion and disorientation. A form of *dementia*.

ambulatory care Care provided to hospital patients who are not admitted to the hospital, such as patients of emergency departments and outpatient clinics. The term is also used to refer to care provided to patients of community-based (non-hospital) health care services.

anaemia A reduced level of haemoglobin, the protein that carries oxygen in the red blood cells. It has many causes, including bleeding (loss of red blood cells), low production of red blood cells, and processes that damage them. It can cause paleness, tiredness and even breathlessness.

AN-DRGs See *diagnosis related groups*.

angina Temporary chest pain or discomfort when the heart's own blood supply is inadequate to meet extra needs, as in exercise. See also *cardiovascular disease*.

angioplasty A method of reducing a blockage in an artery by opening out a balloon placed inside the artery at the point of narrowing. If the artery is a coronary artery the procedure is technically known as percutaneous transluminal coronary angioplasty (PTCA).

anxiety disorders A group of mental disorders marked by excessive feelings of apprehension, worry, nervousness and stress. Includes panic disorder, various phobias, generalised anxiety disorder, obsessive-compulsive disorder and post-traumatic stress disorder.

arrhythmia A disturbed rhythm of the heart beat—either too fast, too slow or irregular.

arthritis A group of disorders in which there is inflammation of the joints, which can become stiff, painful, swollen or deformed. The two main types of arthritis are *osteoarthritis* and *rheumatoid arthritis*.

associated cause(s) of death Any condition(s), diseases and injuries—other than the *underlying cause*—contributing to death. See also *cause of death*.

asthma A chronic inflammatory disease of the air passages causing widespread narrowing in them, obstruction of airflow, and episodes of wheezing, chest tightness and shortness of breath.

atherosclerosis A process in which fatty and fibre-like deposits build up on the inner walls of arteries, often forming *plaques*. It is the main underlying condition in *heart attack, angina*, *stroke* and *peripheral vascular disease*.

atrial fibrillation A condition marked by an irregular rapid heart beat. It arises because the heart's collecting chambers (atria) stop beating rhythmically and quiver uselessly (fibrillate).

auto-immune diseases Diseases, such as *rheumatoid arthritis* and *Type 1 diabetes*, in which the immune system reacts against body tissues and damages them.

available beds Beds immediately available for use by admitted patients.

average length of stay (ALOS) The average of the length of stay for admitted patient episodes.

benchmark A standard or point of reference for measuring quality or performance. See also *benchmarking*.

benchmarking A continuous process of measuring quality or performance against the highest standards. See also *benchmark*.

bipolar affective disorder A mental disorder where the person may be depressed at one time and manic at another. Formerly known as manic depression.

blood cholesterol Fatty substance produced by the liver and carried by the blood to supply the rest of the body. Its natural function is to supply material for cell walls and for steroid hormones, but if levels in the blood become too high this can lead to *atherosclerosis* and heart disease.

body mass index (BMI) The most commonly used method of assessing whether a person is normal weight, underweight, overweight or obese. It is calculated by dividing the person's weight (in kilograms) by their height (in metres) squared, that is, $kg \div m^2$. For both men and women, underweight is a BMI below 18.5, acceptable weight is from 18.5 to less than 25, overweight is 25 and above (includes obese), and obese is 30 and over.

bronchitis Inflammation of the main air passages (the bronchi). May be acute (due to infection) or chronic (most often due to tobacco smoking).

bulk billing The process by which a medical practitioner or optometrist sends the bill for services direct to Medicare. Also known as direct billing.

CABG See *coronary artery bypass graft*.

campylobacteriosis A disease usually marked by diarrhoea, abdominal pain, fever, nausea and vomiting for a few days, caused by some types of Campylobacter bacteria and often foodborne.

cancer A range of diseases where some of the body's cells begin to multiply out of control, can invade and damage the area around them, and can also spread to other parts of the body to cause further damage.

capital expenditure Expenditure on large-scale fixed assets (for example, new buildings and equipment with a useful life extending over a number of years).

cardiovascular disease Any disease of the heart (cardio) or blood vessels (vascular). Includes *heart attack*, *angina*, *stroke* and *peripheral vascular disease*. Also known as *circulatory disease*.

casemix The range and types of patients (the mix of cases) treated by a hospital or other health service. This provides a way of describing and comparing hospitals and other services for planning and managing health care. Casemix classifications put patients into manageable numbers of groups with similar conditions that use similar healthcare resources, so that the activity and cost-efficiency of different hospitals can be compared. See *diagnosis related groups*.

cataract See Box 2.1 in Chapter 2.

cause of death From information reported on the medical certificate of cause of death, each death is classified by the underlying cause of death according to rules and conventions of the 10th revision of the International Classification of Diseases. The underlying cause is defined as the disease that initiated the train of events leading directly to death. Deaths from injury or poisoning are classified according to the circumstances of the violence which produced the fatal injury, rather than to the nature of the injury.

cerebrovascular disease See *stroke*.

chemotherapy The use of drugs (chemicals) to prevent or treat disease, with the term usually being applied to treatment for cancer rather than for other uses.

cholesterol See *blood cholesterol*.

chronic Persistent and long-lasting.

chronic bronchitis Long-term condition with inflammation of the bronchi, the lung's main air passages, causing frequent coughing attacks and coughing up of mucus.

chronic diseases Term applied to a diverse group of diseases, such as heart disease, cancer and arthritis (to name a few), that tend to be long-lasting and persistent in their symptoms or development. Although these features also apply to some communicable diseases (infections), the term is usually confined to non-communicable diseases.

chronic obstructive pulmonary disease (COPD) Serious, progressive and disabling long-term lung disease where damage to the lungs, usually due to both *emphysema* and *chronic bronchitis*, obstructs oxygen intake and causes increasing shortness of breath. By far the greatest cause is cigarette smoking.

circulatory disease See *cardiovascular disease* (alternative name).

cirrhosis Permanently damaged structure of the liver due to extensive death of its cells with resultant scarring. The main causes are chronic alcohol abuse and hepatitis C.

cohort A group of individuals being studied who have experienced the same event at a specified period in time; for example 'birth cohort' refers to people born in the same year.

colonoscopy A procedure whereby the inside of the large bowel (colon) is viewed using a long flexible tube inserted through the anus.

colorectal cancer Cancer of the colon (the lower part of the intestine, usually 1.5 to 2 metres) or of the rectum (the final 15 cm at the end of the colon, ending with the anus).

communicable diseases (infectious diseases) Diseases or illnesses due to infectious organisms or their toxic products. Communication to a person may occur directly or indirectly via contact with other humans, animals or other environments that harbour the organism.

comorbidity When a person has two or more health problems at the same time.

complication A secondary problem that arises from or occurs with a disease or its treatment (such as surgery), worsening the patient's condition and making treatment more complicated.

condition (health condition) See Box 2.3 in Chapter 2.

confidence interval A statistical term describing a range (interval) of values within which we can be 'confident' that the true value lies, usually because it has a 95% or higher chance of doing so.

congenital A condition that is recognised at birth, or that is believed to have been present since birth, including conditions which are inherited or caused by environmental factors.

coronary artery bypass graft (CABG) Surgical procedure using blood vessel grafts to bypass blockages in the coronary arteries and restore adequate blood flow to the heart muscle.

coronary artery disease Disease of the coronary arteries, typically meaning *atherosclerosis*. When this leads to symptoms such as chest pain the result is known as *coronary heart disease*.

coronary heart disease *Heart attack* and *angina*. Also known as *ischaemic heart disease*.

crude death rate See Box 2.4 in Chapter 2.

cryptosporidiosis A disease usually marked by diarrhoea with cramping abdominal pain and other symptoms, caused by *Cryptosporidium parvum* (a protozoan parasite) and transmitted directly from person to person, or foodborne.

dementia A general and worsening loss of brain power such as memory, understanding and reasoning.

dentate Having one or more natural teeth.

depression A mood disorder with prolonged feelings of being sad, hopeless, low and inadequate, with a loss of interest or pleasure in activities and often with suicidal thoughts or self-blame.

determinant Any factor that can increase the chances of ill health (risk factors) or good health (protective factors) in a population or individual. By convention, services or other programs which aim to improve health may not be included.

diabetes (diabetes mellitus) A chronic condition in which the body makes too little of the hormone insulin or cannot use it properly. This raises the blood level of the body's major energy source, the sugar glucose, and causes other widespread disturbance of the body's energy processes. For the three main types of diabetes see *Type 1 diabetes*, *Type 2 diabetes* and *gestational diabetes*.

diagnosis related groups (DRGs) A widely used type of casemix classification system. In the case of Australian acute hospitals, AN-DRGs (Australian National Diagnosis Related Groups) classify admissions into groups with similar clinical conditions (related diagnoses) and similar resource usage. This allows the activity and performance of hospitals to be compared on a common basis. See also *casemix*.

dialysis/haemodialysis A process used to treat kidney failure. A machine is connected to the patient's bloodstream so it can take on the role of the kidneys by removing excess substances and waste from the blood.

diphtheria A bacterial infection that usually starts with soreness of the throat and tonsils but which can also affect other parts of the body and become severe enough to block breathing. It is preventable by vaccine.

direct billing See *bulk billing*.

disability A concept of several dimensions relating to an impairment in body structure or function, a limitation in activities (such as mobility and communication), a restriction in participation (involvement in life situations such as work, social interaction and education), and the affected person's physical and social environment.

disability-adjusted life year (DALY) Years of healthy life lost through premature death or living with disability due to illness or injury.

disorder See Box 2.3 in Chapter 2.

donovanosis Infectious disease (previously called granuloma inguinale) caused by the bacteria *Chlamydia granulomatis*. It features painless genital ulcers with tissue destruction, and can result in secondary infection and scarring.

emphysema A chronic lung disease where over expansion or destruction of the lung tissue blocks oxygen intake, leading to shortness of breath and other problems.

endoscopy The viewing of internal parts of the body, such as the inside of the lower bowel (the colon) with a colonoscope.

enterohaemorrhagic E. coli infection A disease marked by diarrhoea that can be mild or severe and bloody, and sometimes also the haemolytic-uraemic syndrome (sudden kidney failure and anaemia in children) and other symptoms. It is caused by some types of *E. coli* bacteria and is usually foodborne.

epidemic An outbreak of a disease or its occurrence at a level that is clearly higher than previously existed.

epidemiology The study of the patterns and causes of health and disease in populations, and the application of this study to improve health.

epilepsy A disturbance of brain function marked by recurrent fits and loss of consciousness.

external cause Environmental event, circumstance and/or condition as the cause of injury, poisoning and/or other adverse effect. The term is used in disease classification.

fertility rate Number of live births per 1,000 women aged 15–49.

foetal death Birth of a foetus weighing at least 400 grams (or, where birthweight is unavailable, of at least 20 weeks gestation), which shows no signs of life. Commonly referred to as stillbirth.

foetal death rate Number of foetal deaths per 1,000 total births (foetal deaths plus live births).

freestanding day hospital facility A private hospital where only minor operations and other procedures not requiring overnight stay are performed, and which does not form part of any private hospital providing overnight care.

gastroscopy A procedure whereby the inside of the stomach is viewed using a flexible tube passed down into it via the mouth.

generalised anxiety disorder A mental disorder where a person is overly and unrealistically anxious and worried about many things over a long period. One of the group of *anxiety disorders*.

gestational diabetes Diabetes which is first diagnosed during pregnancy (gestation). It may disappear after pregnancy but signals a high risk of diabetes occurring later on.

gout Disease of excess uric acid in the blood causing attacks of joint pain (most often in the big toe) and other problems.

gross domestic product (GDP) A statistic commonly used to indicate national wealth. It is the total market value of goods and services produced within a given period after deducting the cost of goods and services used up in the process of production but before deducting allowances for the consumption of fixed capital.

haemodialysis See *dialysis*.

health Term relating to whether the body (which includes the mind) is in a good or bad state. With good health the state of the body and mind are such that a person feels and functions well and can continue to do so for as long as possible. See also *public health*.

health indicator See *indicator*.

health outcome A change in the health of an individual or population due wholly or partly to a preventive or clinical intervention.

health promotion Activities to improve health and prevent disease, often described as the process that helps individuals and communities to increase control over the *determinants* of health.

health status An individual's or population's overall level of health, taking account of various aspects such as *life expectancy*, amount of disability, levels of disease risk factors and so forth.

heart attack Life-threatening emergency that occurs when a vessel supplying blood to the heart muscle is suddenly blocked completely by a blood clot. The medical term commonly used for a heart attack is *myocardial infarction*. See also *cardiovascular disease*.

heart failure When the heart cannot pump strongly enough to keep the blood circulating around the body at an adequate rate.

hepatitis Inflammation of the liver, which can be due to certain viral infections, alcohol excess or a range of other causes.

Hib (Haemophilus influenzae type b) A bacterial infection of infants and children that can cause meningitis, pneumonia and other serious effects. It is preventable by vaccine.

highly specialised drugs Under Section 100 of the National Health Act, certain drugs (for example, Cyclosporin) can only be supplied to community patients through hospitals because the hospitals can provide the facilities or staff necessary for the appropriate use of the drugs. These drugs are funded by the Commonwealth separately from the Pharmaceutical Benefits Scheme.

Hodgkin's disease (Hodgkin's lymphoma) A cancer marked by progressive painless enlargement of lymph nodes throughout the body. A form of *lymphoma*.

hostel Establishment for people who cannot live independently but who do not need nursing care in a hospital or nursing home. Hostels provide board, lodging or accommodation and cater mostly for the aged, distressed or disabled. Residents are generally responsible for their own provisions but may be given domestic assistance such as help with meals, laundry and personal care.

hypertensive disease Disease occurring when high blood pressure (hypertension) is severe or prolonged enough to cause damage to the heart, brain or kidneys.

illness see Box 2.3 in Chapter 2.

immunisation Inducing immunity against infection by the use of an antigen to stimulate the body to produce its own antibodies. See *vaccination*.

impaired glucose tolerance Condition in which blood glucose levels are higher than normal but less than required for a diagnosis of diabetes, and which signals an increased risk of developing *Type 2 diabetes*.

impairment Any loss or abnormality of psychological, physiological or anatomical structure or function.

incidence The number of new cases (of an illness or event, etc.) occurring during a given period. Compare with *prevalence*.

indicator A key statistic chosen to describe (indicate) a situation concisely, help assess progress and performance, and act as a guide to decision making. It may have an indirect meaning as well as a direct one; for example, Australia's overall death rate is a direct measure of mortality but is often used as a major indicator of population health.

Indigenous A person of Aboriginal and/or Torres Strait Islander descent who identifies as an Aboriginal and/or Torres Strait Islander and is accepted as such by the community with which he or she is associated.

inflammation Local response to injury or infection, marked by local redness, heat, swelling and pain. Can also occur when there is no clear external cause and the body reacts against itself, as in *auto-immune diseases*.

insulin Hormone that is produced by the pancreas and regulates the body's energy sources, most notably the sugar glucose.

International Classification of Diseases The World Health Organization's internationally accepted classification of death and disease. The 10th Revision (ICD-10) is currently in use. In this report, causes of death classified before 1979 under previous revisions have been reclassified to ICD-10 by the AIHW.

intervention (for health) Any action taken by society or an individual which 'steps in' (intervenes) to improve health, such as medical treatment and preventive campaigns.

ischaemia Reduced or blocked blood supply. See also *ischaemic heart disease*.

ischaemic heart disease *Heart attack* and *angina* (chest pain). Also known as *coronary heart disease*.

length of stay Duration of hospital stay, calculated by subtracting the date the patient is admitted from the day of separation. All leave days, including the day the patient went on leave, are excluded. A same-day patient is allocated a length of stay of 1 day.

life expectancy An indication of how long a person can expect to live. Technically it is the number of years of life remaining to a person at a particular age if death rates do not change.

listeriosis A disease which normally appears in otherwise healthy people as an acute, mild fever, sometimes with influenza-like symptoms, caused by the bacteria *Listeria monocytogenes* and usually foodborne. It can cause more severe symptoms in newborns, the elderly, people with poor immunity and pregnant women (in whom it can also cause abortion).

low birthweight Weight of a baby at birth that is less than 2,500 grams.

lymphoma A cancer of the lymph nodes. Lymphomas are divided into two broad types, *Hodgkin's disease* lymphomas and *non-Hodgkin's lymphomas* (NHLs).

major diagnostic categories (MDCs) A high level of groupings of patients used in the AN-DRG classification. See also *diagnosis related groups*.

malignancy See *cancer*.

mammogram X-ray of the breast. It may be used to assess a breast lump or as a screening test in women with no evidence of cancer.

mania A mental disorder where the person is overexcited, overactive and excessively and unrealistically happy and expansive. It is the opposite of depression and can alternate with it in the same person in what is known as *bipolar affective disorder* (formerly known as manic depression).

manic depression, manic depressive disorder See *bipolar affective disorder*, *mania*, and *depression*.

measles A highly contagious infection, usually of children, that causes flu-like symptoms, fever, a typical rash and sometimes serious secondary problems such as brain damage. It is preventable by vaccine.

median The midpoint of a list of observations ranked from the smallest to the largest.

Medicare A national, government-funded scheme that subsidises the cost of personal medical services for all Australians and aims to help them afford medical care.

melanoma A cancer of the body's cells that contain pigment (melanin), mainly affecting the skin.

meningitis Inflammation of the brain's covering (the meninges), as can occur with some viral or bacterial infections.

mental disorders Disturbances of mood or thought that can affect behaviour and distress the person or those around them, so the person cannot function normally. They include *anxiety disorders*, *depression* and *schizophrenia*.

metastasis The spread of a cancer from its original site to other parts of the body.

morbidity Refers to ill health in an individual and to levels of ill health in a population or group.

mortality Death.

motor neurone disease A serious disease of the nervous system with progressive wasting of muscles, weakness and paralysis.

multiple sclerosis One of the most common nervous system disorders, with varied symptoms such as loss of control of limbs, sudden vision problems and disturbed sensations.

mumps A contagious viral disease marked by acute and painful swelling of the saliva-producing glands, often similarly affecting the testicles and sometimes other parts.

musculoskeletal Relating to the muscles, joints and bones.

myocardial infarction Term still commonly used to mean a *heart attack*, but more correctly refers only to those heart attacks which have caused some death of heart muscle.

neonatal death Death of an infant within 28 days of birth.

neonatal mortality rate Number of neonatal deaths per 1,000 live births.

neoplasm An abnormal ('neo', new) growth of tissue. Can be 'benign' (not a cancer) or 'malignant' (a cancer). Same as a *tumour*.

neural tube defects Defects such as spina bifida and anencephalus that have arisen in the neural tube, the part of the embryo that develops into the brain and spinal cord.

neurosis/neurotic disorders A broad category of mental disorders with anxiety as their main feature and whose symptoms are mostly exaggerations of normal emotions or behaviour. They include *anxiety disorders*, *obsessive-compulsive disorder*, *stress* reactions and other problems.

non-admitted patient A patient who receives care from a recognised non-admitted patient service/clinic of a hospital.

non-Hodgkin's lymphoma A range of cancers of the lymphatic system (lymph glands and the channels they are linked to) which are not of the Hodgkin's variety.

nursing homes Establishments which provide long-term care involving regular basic nursing care to chronically ill, frail, disabled or convalescent people or senile inpatients.

obesity Marked degree of overweight, defined as *body mass index* 30 and over. See also *overweight*.

obsessive-compulsive disorder A form of *anxiety disorder* where repeated and unwanted thoughts and impulses disturb and dominate a person. Often involves rituals such as excessive hand washing, checking and counting, which in turn cause anxiety if they are prevented or out of control.

occasion of service Occurs when a patient receives some form of service from a functional unit of the hospital, but is not admitted.

ophthalmology A medical specialty dealing with eye diseases.

Organisation for Economic Co-operation and Development (OECD) An organisation of 30 developed countries, including Australia.

osteoarthritis A chronic and common form of *arthritis*, affecting mostly the spine, hips, knees and hands. It first appears from the age of about 30 and is more common and severe with increasing age.

osteoporosis Thinning and weakening of the bone substance, with a resulting risk of fracture.

outcome (health outcome) A health-related change due to a preventive or clinical intervention or service. (The intervention may be single or multiple, and the outcome may relate to a person, group or population, or be partly or wholly due to the intervention.)

overweight Defined as a body mass index 25 and over. See also *obesity*.

panic disorder Marked by panic attacks (episodes of intense fear or discomfort) that occur suddenly and unpredictably.

Pap smear Papanicolaou smear, a procedure to detect cancer and pre-cancerous conditions of the female genital tract.

parasuicide The deliberate or ambivalent act of self-damage which is potentially life-threatening, but does not result in death.

pathology General term for the study of disease, but often used more specifically for diagnostic services which examine specimens, such as samples of blood or tissue.

patient days The number of full or partial days of stay for patients who were admitted for an episode of care and who underwent separation during the reporting period. A patient who is admitted and separated on the same day is allocated 1 patient-day.

performance indicators Measures of the efficiency and effectiveness of health services (hospitals, health centres, etc.) in providing health care.

perinatal death Foetal or neonatal death.

perinatal mortality rate Number of perinatal deaths per 1,000 total births (foetal deaths plus live births).

perinatal Pertaining to or occurring in the period shortly before or after birth (usually 28 days) .

peripheral vascular disease Pain in the legs due to an inadequate blood supply to them.

pertussis (whooping cough) A highly infectious bacterial disease of the air passages marked by explosive fits of coughing and often a whooping sound on breathing in. It is preventable by vaccine.

Pharmaceutical Benefits Scheme (PBS) A national, government-funded scheme that subsidises the cost of a wide range of pharmaceutical drugs, and that covers all Australians to help them afford standard medications.

phobia A form of *anxiety disorder* in which there is persistent, unrealistic fear of an object or situation and which interferes with the person's life as they seek to avoid the object of their fear. Phobias include fear of heights, flying, open spaces, social gatherings, and animals such as spiders and snakes.

plaque (atherosclerotic) A localised area of *atherosclerosis*, especially when raised or built up.

poliomyelitis (polio) Muscle paralysis, wasting and deformity of limbs after infection by a common virus (poliovirus) that can damage the so-called motor nerves in the spinal cord. It is preventable by vaccine.

post-traumatic stress disorder (PSD) A form of *anxiety disorder* in which a person has a delayed and prolonged reaction after being in an extremely threatening or catastrophic situation such as a war, natural disaster, terrorist attack, serious accident or witnessing violent deaths.

potential years of life lost (PYLL) Number of potential years of life lost in a population as a result of premature death.

prescription drugs Pharmaceutical drugs available only on the prescription of a registered medical practitioner and available only from pharmacies.

prevalence The number or proportion (of cases, instances, etc.) present in a population at a given time. Compare with *incidence*.

prevention (of disease) Action to reduce or eliminate the onset, causes, complications or recurrence of disease.

principal diagnosis The diagnosis describing the problem that was chiefly responsible for the patient's episode of care in hospital.

principal procedure The most significant procedure that was performed for treatment of the principal diagnosis.

private health insurance See Box 5.6 in Chapter 5.

private hospital A privately owned and operated institution, catering for patients who are treated by a doctor of their own choice. Patients are charged fees for accommodation and other services provided by the hospital and relevant medical and paramedical practitioners. The term includes private freestanding day hospital facilities.

private patient Person admitted to a private hospital, or person admitted to a public hospital who decides to choose the doctor(s) who will treat them and to have private ward accommodation. This means they will be charged for medical services, food and accommodation.

prostate cancer Cancer of the prostate, the male organ that sits next to the urinary bladder and contributes to the semen (sperm fluid).

psychiatric hospitals Establishments devoted primarily to the treatment and care of inpatients with psychiatric disorders.

psychosis A broad grouping for a more severe degree of mental disturbance, often involving fixed, false beliefs known as delusions.

public health Term variously referring to the level of health in the population, to actions that improve that level or to related study. Activities that aim to benefit a population tend to emphasis prevention, protection and health promotion as distinct from treatment tailored to individuals with symptoms. Examples include provision of a clean water supply and good sewerage, conduct of anti-smoking education campaigns, and screening for diseases such as cancer of the breast and cervix.

public hospital A hospital controlled by a state or territory health authority. In Australia public hospitals offer free diagnostic services, treatment, care and accommodation to all Australians who need it.

public patient A patient admitted to a public hospital who has agreed to be treated by doctors of the hospital's choice and to accept shared ward accommodation. This means that the patient is not charged.

quintile A group derived by ranking the population according to specified criteria and dividing it into five equal parts.

radiology The use or study of X-rays and other rays to help view internal parts of the body as a guide to diagnosis as well as to treatment and its progress.

real expenditure Expenditure expressed in terms which have been adjusted for inflation (for example, in 1989–90 dollars). This enables comparisons to be made between expenditures in different years.

recurrent expenditure Expenditure on goods and services which are used up during the year, for example, salaries. It may be contrasted with capital expenditure, such as expenditure on hospital buildings and large-scale diagnostic equipment, the useful life of which extends over a number of years.

refraction The eye's ability to bend light rays that enter it, to form an image at the back of the eye.

renal dialysis A treatment for kidney failure where the patient is connected to a machine which does the kidneys' work by filtering the blood to control its contents.

revascularisation ('re-vesselling') Restoring adequate blood flow to the heart or other part of the body, usually after the supply has been reduced or blocked, as in *angina* or a *heart attack*. Revascularisation includes methods such as *angioplasty* and *coronary artery bypass graft* surgery.

rheumatic fever An acute, serious disease that affects mainly children and young adults and can damage the heart valves, the heart muscle and its lining, the joints and the brain. Is brought on by a reaction to a throat infection by a particular bacterium. Now very rare in the non-Indigenous population, it is still at unacceptably high levels among Indigenous Australians living in remote areas. See *rheumatic heart disease*.

rheumatic heart disease Chronic disease from damaged heart valves caused by earlier attack(s) of *rheumatic fever*.

rheumatoid arthritis A chronic, multisystem disease whose most prominent feature is joint inflammation, most often affecting the hand joints in symmetrical fashion. Can occur in all age groups but most commonly appears between ages 20 to 40 years. Its causes are not certain but involve *auto-immune* processes.

risk factor Any factor which represents a greater risk of a health disorder or other unwanted condition or event. Some risk factors are regarded as causes of disease, others are not necessarily so.

rubella (German measles) A contagious viral disease of children and young adults which has mild symptoms but which often causes serious birth defects if it occurs in a mother during the first three months of pregnancy. It is preventable by vaccine.

salmonellosis A disease commonly marked by sudden onset of headache, abdominal pain, fever, diarrhoea, nausea and sometimes vomiting, caused by some types of salmonella bacteria and often foodborne.

same-day patients Admitted patients who are admitted and separated on the same day.

schizophrenia A group of serious mental disorders where imagined and disordered thoughts are key features, often with problems of behaviour, mood and motivation, and a retreat from social life.

separation The formal process by which a hospital records the completion of treatment and/or care for an admitted patient. See Box 6.1 in Chapter 6.

shigellosis A disease characterised by acute diarrhoea with fever, nausea and sometimes other symptoms, usually transmitted directly from person to person via the faecal-oral route. It is caused by shigella species bacteria, including *Shigella dysenteriae 1*, the cause of dysentery.

sign (clinical) An indication of a disorder that is detected by a clinician or other observer who examines the person affected. Unlike with symptoms, a patient does not necessarily notice or complain of a sign and many signs are detected only with special techniques used by the person doing the examination.

statistical significance An indication from a statistical test that an observed difference or association may be significant or 'real' because it is unlikely to be due just to chance. A statistical result is usually said to be 'significant' if it would occur by chance only once in twenty times or less often.

stent A metal mesh tube that is expanded within an artery at a point of narrowing and left there to hold the artery open.

stillbirth See *foetal death*.

stress Poorly defined term referring to when a person is under significant psychological or physical pressure—real or perceived, acute or chronic. Examples include illness or injury, bereavement, family problems, work demands or job loss.

stroke When an artery supplying blood to the brain suddenly becomes blocked or bleeds. Often causes paralysis of parts of the body normally controlled by that area of the brain, or speech problems and other symptoms.

substance use disorders Result from harmful use and/or dependence on illicit or licit drugs, including alcohol, tobacco and prescription drugs.

suicide Deliberately ending one's own life.

symptom Any indication of a disorder that is apparent to the person affected. Compare with *sign (clinical)*.

tetanus A serious infection with a bacterial nerve poison causing spasm of the jaw muscles (lockjaw) and body muscles generally, from a bacterium entering through a wound. The disease is preventable by vaccine.

thrombolysis Emergency 'clot-busting' drug treatment for a *heart attack*.

thrombosis Clotting of blood, with the term usually applied to clotting within a blood vessel due to disease, as in a *heart attack* or *stroke*.

TIA, transient ischaemic attack A 'mini' *stroke*, with temporary problems in speech or paralysis that last for 24 hours or less, often only minutes. It is a strong warning sign of a more severe stroke.

tinnitus The sensation of ringing or other sounds in the ears when there is no external source of sound.

Torres Strait Islander A person of Torres Strait Islander descent who identifies as a Torres Strait Islander and is accepted as such by the community in which he or she lives.

tuberculosis (TB) A bacterial disease that affects the lungs especially, with serious fever-like symptoms and destruction of tissue. It can spread to other parts of the body, causing secondary problems and often death if not treated.

tumour See *neoplasm*.

Type 1 diabetes A form of diabetes usually arising in childhood or youth ('juvenile onset'), marked by a complete lack of insulin and needing insulin replacement for survival.

Type 2 diabetes The most common form of diabetes, occurring mostly in people aged 40 years and over and marked by reduced or less effective insulin.

underlying cause of death The condition, disease or injury initiating the sequence of events leading to death, that is, the primary, chief, main or principal cause. Compare with *associated cause(s) of death*.

underweight Defined as a *body mass index* less than 18.5.

unstable angina A form of *angina* that is more dangerous than normal angina but less so than a *heart attack*. It can feature chest pain that occurs at rest; and in someone who already has angina it can be marked by new onset of chest pain with exertion or pain that accelerates by coming on more easily, more often or for longer than previously.

vaccination The process of administering a vaccine to a person to produce immunity against infection. See *immunisation*.

vector An insect or other organism that transmits infectious microorganisms from animal to human or human to human.

ventricular septal defect A congenital defect of the heart that occurs as an abnormal opening in the wall that separates the left and right main pumping chambers (the ventricles).

whooping cough See *pertussis*.

yersiniosis A disease typically involving acute diarrhoea, fever, and other abdominal symptoms, caused by the bacteria *Yersinia pseudotuberculosis* and *Yersinia enterocolitica* and often foodborne.

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