Australia's Health 1994 is the fourth biennial health report of the Australian Institute of Health and Welfare.
It provides current information on almost all aspects of health and health services in Australia, as well as detailing key sources of health information and statistics in this country, and directions for the future.

Australia's Health 1994 is an important reference text and information source for all Australians with an interest in health, in addition to medical and paramedical personnel and students, health workers and those working in or studying health administration, policy, planning and management.

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AUSTRALIA'S HEALTH 1994

AIHW

AUSTRALIA'S HEALTH 1994

AUSTRALIAN INSTITUTE OF
HEALTH & WELFARE

Australian Institute of Health and Welfare

The Institute is an independent statistics and research agency within the Commonwealth Human Services and Health portfolio. Established as the Australian Institute of Health in 1987, its Act was amended in 1992 to expand its role to study welfare-related information and statistics.

The mission of the Australian Institute of Health and Welfare is to inform community discussion and to support public policy-making on health and welfare issues by coordinating, developing, analysing and disseminating national statistics on the health of Australians and their health and welfare services, and by undertaking and supporting related research and analysis.

The Institute addresses this mission by pursuing the requirements of its Act to:

- collect and assist in the production of health- and welfare-related information and statistics;
- conduct and promote research into the health of Australians and their health services;
- develop statistical standards relevant to health and to health and welfare services;
- publish reports on work carried out by or in association with the Institute;
- undertake studies into the provision and effectiveness of health services and technologies; and
- make recommen[illegible] the prever[illegible]ion and tr[illegible] diseases and the improvement an[illegible] of [illegible] and [illegible] and health [illegible]s of the people of Australia.

The Australian Institute of Health and Welfare (AIHW) produces a wide range of publications based on its work program. The publications cover topics such as health expenditure, hospital use, health technology, the health labourforce, health differentials, cancer, mortality, nutrition, child welfare, disability services, aged care, housing assistance, dental statistics, perinatal statistics and injury surveillance. A complete list of the Institute's publications is available from:

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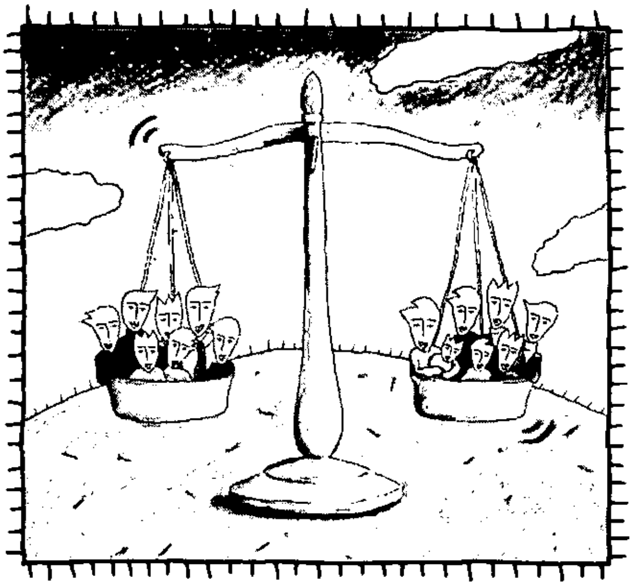
AUSTRALIA'S HEALTH 1994

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



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AUSTRALIAN INSTITUTE OF
HEALTH & WELFARE

Hon Carmen Lawrence MP
Minister for Human Services and Health
Parliament House
Canberra ACT 2600

Dear Minister

The Institute is pleased to present to you *Australia's health 1994,* a report covering those aspects of Australia's health and health services for which data are currently being collected either nationally or in some States and Territories. The report is required under the *Australian Institute of Health and Welfare Act 1987.*

Yours sincerely

Fiona Stanley
Chair

16 June 1994

Australia's health 1994

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The Institute wishes particularly to thank those people from other bodies who have contributed to the production of Australia's health 1994.

Objectives of the Australian Institute of Health and Welfare

Seven specific objectives have been identified as essential elements of the Institute's endeavour from 1993–94 to 1995–96. They require the Institute:

A: To lead the development of national systems of health statistics and welfare services statistics, to improve the availability and quality of national data and to avoid duplication of effort.

B: To develop, maintain and promote the use of statistical standards for health and welfare services to ensure the comparability of national and State/Territory data (in collaboration with the Australian Bureau of Statistics).

C: To develop national data collections and national databases to support its own reporting, analysis and research, and that of others

D: To conduct and promote research into the health of Australians, and their health and welfare services, and to assess the provision, use, cost and effectiveness of health services and technologies.

E: To make its data and the findings of its analysis and research widely available.

F: To seek to raise the level of understanding of its contribution to health and welfare statistics and research, by health and welfare leaders in government and the community.

G: To ensure that its resources are used efficiently and effectively.

Contents

Appendix

Preface

The mission of the Australian Institute of Health and Welfare is to inform community discussion and to support public policy-making on health and welfare issues by coordinating, developing, analysing and disseminating national statistics on the health of Australians and their health and welfare services, and by undertaking and supporting related research and analysis.

The Institute's national statistical collections include the annual Hospital Utilisation and Cost Studies combining information about expenditure and use of all public hospitals, national data on the incidence of cancer assembled collaboratively with the State and Territory Cancer Registries, a not-yet-complete National Death Index developed with the support of Registrars of Births, Deaths and Marriages in all States and Territories, and national collections on health labourforce based on annual surveys carried out in association with professional registration boards. Four key factors have made these collections possible: first, negotiation with the States and Territories so that National Minimum Data Sets are used in data supplied to the Institute; second, the establishment of common definitions and standards for the collection of each item of data—in the health area this work appears as an increasingly substantial National Health Data Dictionary; third, the signing with the relevant Commonwealth and State and Territory authorities and the Australian Bureau of Statistics of National Health and Welfare Information Agreements which commit the parties to cooperation in the collection of national data; and, finally, very strict safeguards on use and confidentiality, mandated by the Institute's Act, which commit it to rigorous protection of the interests of both the providers of data and the data subjects.

The Institute is now working on a plan for health information in Australia that examines existing provisions and future needs, identifies what is most important, and thereby sets priorities for the continuation and further development of existing collections or the development of new ones. This the Institute proposes to do in association with the 1994 National Health Information Forum which is introduced in Section 5.8 of this report.

Through *Australia's health 1994*, the Institute fulfils again its statutory obligation to report biennially on health. As a compendium of current information on health and health services in Australia and the key resources and directions in health information and statistics, this volume will be important to all those involved in health policy, planning and evaluation in this country. In addition, it will be an important reference and useful text for courses in public health, health management and related fields.

Bruce Armstrong
Director
Australian Institute of Health and Welfare

1 The health of Australians

Australia is one of the healthiest countries in the world and the health of Australians generally continues to improve. There are, however, some aspects of health and some population subgroups in which substantial improvements are necessary.

Australia's health 1994 describes improvements in health but concentrates on what remains to be done. The first two chapters review data on the health of Australians. This first chapter examines information on mortality, sickness and disease, disability, handicap and risk factors for disease as measures of the health (or lack of it) of the nation. It shows substantial differences among subgroups of the Australian population characterised by age, sex, socioeconomic status, country of origin and place of residence. The analysis also shows that the health of the nation is related to its levels of nutrition, education, employment, income and housing, safety in the environment, and social and cultural factors.

1.1 Health and its determinants

What is health?

In 1946 the World Health Organization (WHO) defined health as 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity' (WHO 1946).

This definition has stood the test of time. It has the virtue of placing a strong emphasis on health as a positive experience, rather than as the absence of negatives. Another strength, to which this discussion will return, is that the inclusion of social well-being places health in a broad social context. However, the broad context makes development of measures of health difficult.

In daily use, 'health' can mean the absence of disease, impairment, disability, or handicap. These problems can be physical or mental. 'Health' can also refer to vitality. These are all essential elements of health but do not capture the breadth of the WHO definition. Health can be seen as a major contributor to total well-being (AIHW 1993) which itself includes:

- health;
- social well-being;
- economic well-being;
- environmental well-being;
- life satisfaction;
- spiritual or existential well-being; and
- other characteristics valued by humans.

To complicate the problems of definition, almost all 'health statistics' (and, indeed, statistics in this volume) are of ill-health, not of the lack of it.

What determines health?

The evolution of thinking about what determines health is instructive. Twenty years ago, disease was seen as an outcome of the interaction of human biology, lifestyle factors and environmental factors, as well as being modified by health care (Lalonde 1974). An analysis of the factors related to the ten leading causes of death in the United States attributed 50% of premature mortality to unhealthy behaviour and lifestyles, 20% to human biology, 20% to the physical environment and 10% to inadequate health care (Centers for Disease Control 1977).

Later, despite persisting uncertainties about the actual causative mechanisms (Last 1987; Marmot & Morris 1984; Syme 1986), the importance of social factors was recognised. The elements of the social environment seen as important in health and disease include psychological, cultural, educational, and economic factors. They also include occupation, marital status, major life events, social networks and social support.

The Ottawa Charter (WHO 1986) reflected these developing views by placing great emphasis on the need to develop very broad health promotion strategies to bring about changes in the physical, social and economic environment in which people live. It recognised that the capacity of individuals to alter their behaviour is greatly influenced by social and cultural factors.

The Ottawa Charter's health promotion strategies included the advocacy of a clear political commitment to health (sometimes referred to as healthy public policy); creating supportive environments; strengthening community action; developing personal skills; re-orienting health services towards the promotion of health; and changes in professional education and training. The strategy was reviewed in detail in *Australia's health 1992.*

The Ottawa Charter provided a broader framework for public policy to influence health. It provided for intersectoral and health promotion approaches to improving health. An example of their successful application is a study which reduced the proportion of low-birthweight babies by providing an income supplement to single social security beneficiaries during pregnancy (Kehrer & Wohn 1979).

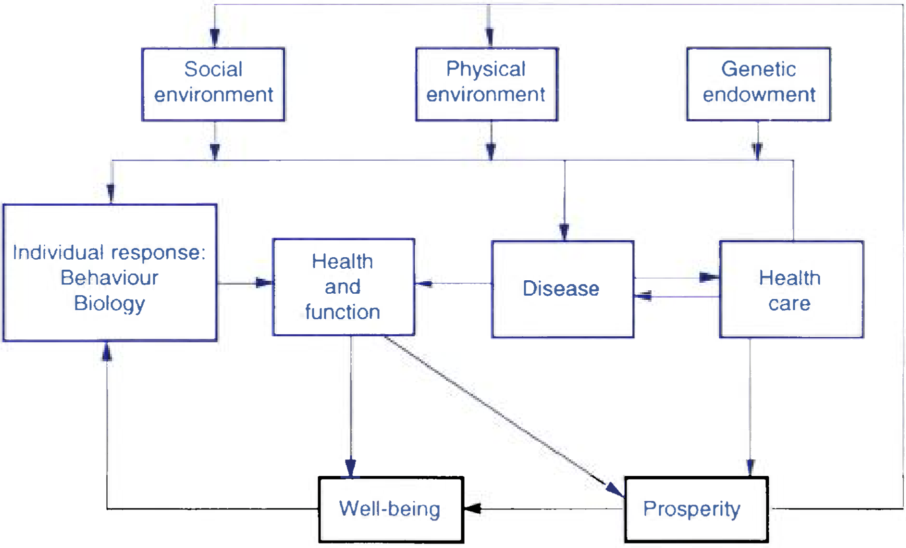
Some insight into the mechanisms by which social factors influence health came from the United Kingdom, where the Working Group on Inequalities in Health considered explanations for differences in health according to social class as indicated by occupation (Townsend & Davidson 1982). It recognised 'the multi-causal nature of health inequalities' and that there was not 'any single and simple explanation of the complex data' it had assembled. It added material and structural factors to the list of factors influencing health. These factors 'locate the responsibility for inequalities in health in the social structure governing the distribution of resources towards different groups of people' (Power, Manor & Fox 1991).

The UK Group stressed 'the importance of material conditions in life' in its policy recommendations, thus recognising the inequity of factors affecting health over which individuals and sectors of society have limited, if any, control (Townsend & Davidson 1982).

Recent work in Europe has directed attention to the combined effects of individual and social factors in determining patterns of health in populations. For example, Whitehead (1990) identified seven main determinants of health differences:

- natural, biological variation;
- health-damaging behaviour if freely chosen (such as through participation in hazardous sports and pastimes);
- the transient health advantage of one group over another, when that group is the first to adopt a health-promoting behaviour (as long as other groups have the means to catch up fairly soon);
- health-damaging behaviour, where the degree of choice of lifestyles is severely limited;
- exposure to unhealthy, stressful living and working conditions;
- inadequate access to essential health and other public services; and
- health-related social mobility.

A recent model defining the determinants of health is shown in Figure 1.1.



Source: Evans & Stoddart 1990

Figure 1.1: ***Health, well-being and prosperity***

This model acknowledges that health and economic well-being are related and that health care services compete with social goods and private disposable income for a share of national wealth. It also recognises that health care both contributes to the productivity of the population and reduces productive capacity by drawing capital and highly skilled people into the sector. Economic prosperity generally contributes to the well-being of the population, and this, of itself, reduces illness.

Money spent on health reduces the amount available to be spent on other activities which increase total well-being; where resources are limited, improvements to health may have a cost in other aspects of total well-being. Many of the factors that contribute to other aspects of well-being are also important determinants of health.

Implications

A consequence of health being influenced by factors beyond the control of the health sector is that many other areas of government can influence health. A UK review (Jacobson, Smith & Whitehead 1991) stated, 'The actions that will have an impact are (as the World Health Organization never ceases to remind us) multi-sectoral. The NHS on its own can do relatively little to improve the health of the nation above the current high levels. Housing, employment, education, transport, tax policy, all have their parts to play in improving the "bottom line" for the people of this country—which is not simply a matter of more wealth, but also involves raising the quality of life in Britain, particularly for our poorest citizens.'

Australian health authorities are now pointing to the effects on health of social, economic and physical factors in the environment, with the aim of creating a supportive and nurturing environment capable of sustaining healthy living. In recognition of the fact that people are not entirely free to choose particular lifestyles but must adapt their behaviour to their life situations, attention is also being directed to changing the adverse influences on health that are beyond the control of the individual.

It would be premature to claim that other areas of government in Australia have accepted this view wholeheartedly. They do accept that health should be a consideration in all areas of public policy, but that is all.

1.2 Measures of ill-health

1.2.1 Mortality

There are many ways of measuring health or ill-health. Mortality is one of the best known measures, and certainly the most widely available. The availability is important, because in studies of health statistics the question is almost always one of comparison—is the mortality in one place better or worse than in another?, is the mortality in one population subgroup better or worse than in another?—and rarely of the absolute value. Records of deaths have been kept for centuries in some places; national statistics of cause of death have been available for Australia since soon after federation.

Mortality in migrants is discussed in Section 1.3.2, page 25, and mortality in Aboriginal and Torres Strait Islander peoples in Section 1.3.3, page 26.

Death rates

When national statistics first became available in 1907, there were 12 deaths per 1,000 population per year. By the middle of the century, the crude death rate had fallen to 10 per 1,000, and in 1992 it was 7.1 per 1,000 population per year. The lowest crude death rate recorded was 6.9 deaths per 1,000 population in 1991.

Box 1.1: Comparing death rates

Statistics relating to deaths are sometimes presented as ***crude death rates****, that is, the number of deaths in a year divided by the number in the corresponding population. For example, the crude death rate in Australia in 1992 was 7.1 per 1,000 population.*

Since the risk of dying varies greatly with age and sex, even small differences in the age and sex structure of populations, especially at older ages, may affect comparison of crude death rates. One way around this difficulty is to compare ***age-specific death rates,*** *mortality at particular ages for each sex, but this may mean that a separate comparison has to be made for each of many age and sex groups.*

Age-standardised death rates *are summary measures which allow comparison of populations with different age distributions; either different populations at the same time or the same population at different times. They are usually presented separately for males and females.*

For comparisons of Australian death rates over time, rates have been standardised to the Australian population at 30 June 1988 (ABS 1989). The WHO European standard population (WHO 1992) has been used for computing age-standardised rates for international comparisons. These standard populations were also used in Australia's health 1992, so that most rates in this publication may be directly compared with those in its predecessor.

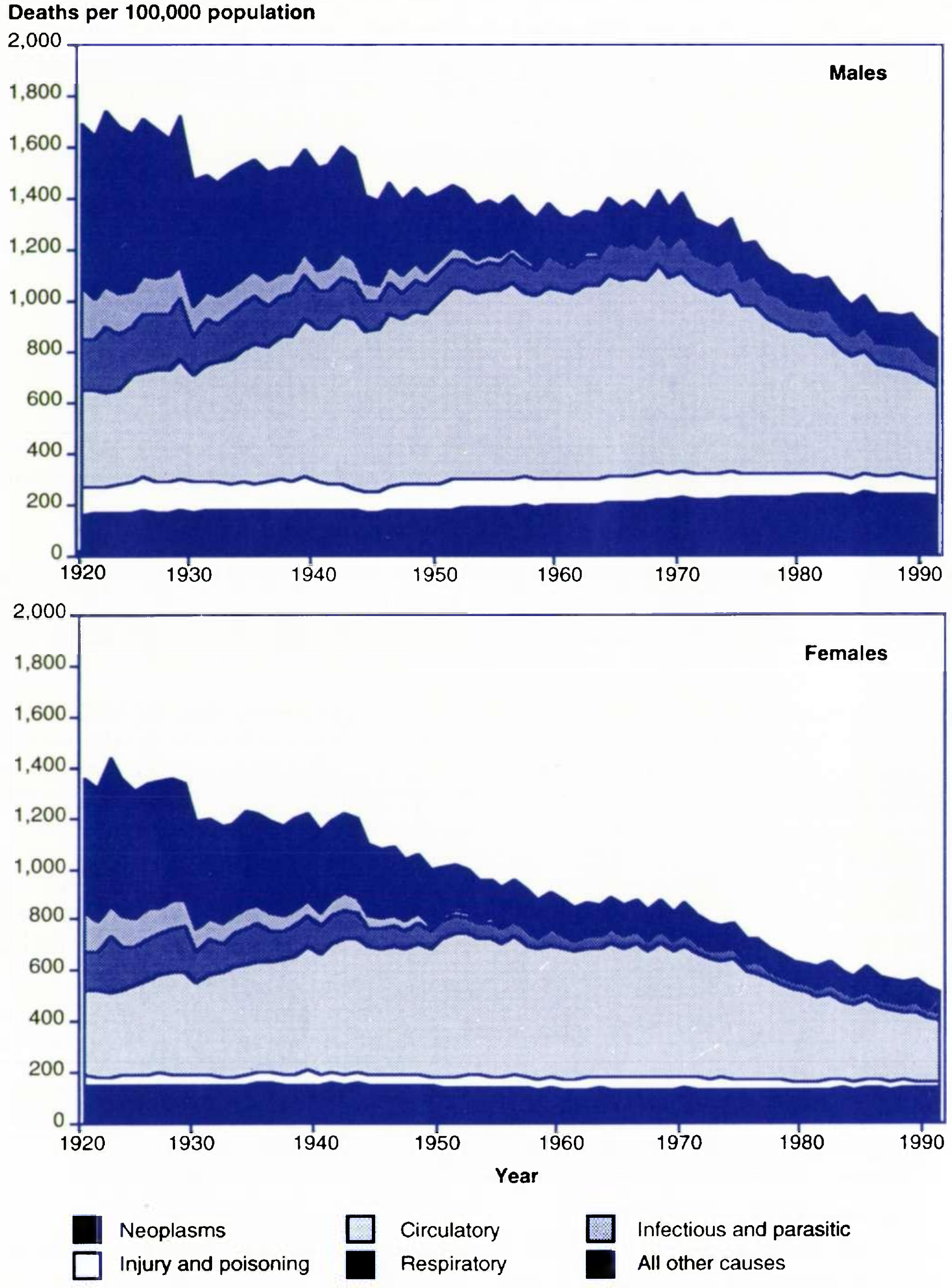
In 1921, the male and female age-standardised death rates were, respectively, 16.9 and 13.6 deaths per 1,000 population. By 1992, they had declined to 8.6 and 5.2 per 1,000 population respectively.

Major causes of death

Trends in major causes of death since 1921 are shown in Figure 1.2. In 1921, infectious and parasitic diseases were the second major cause of death and, with an age-standardised death rate of 1.8 deaths per 1,000 population, accounted for about 12% of all deaths. By the 1950s, the death rate from these causes had declined to less than 0.4 per 1,000 population, accounting for about 3% of all deaths. In the last 40 years there has been a further decline in the death rate to 0.05 deaths per 1,000 population.

The shift away from infectious diseases was accompanied by an increase in both the age-standardised death rates and the proportion of deaths attributed to diseases of the circulatory system and to cancers. In 1921, most deaths in Australia were caused by diseases of the circulatory system. With an age-standardised death rate of 3.5 per 1,000 population, these diseases then accounted for about 22% of all deaths in Australia. At the same time, cancers accounted for 10% of deaths. By 1965, these causes together accounted for nearly 75% of deaths.

Around 1965, the general consensus was that prospects for lower mortality as a result of advances in prevention or treatment were limited, so that further declines in mortality would be minimal. This expectation, which persisted into the 1970s, arose mainly from the constancy of mortality rates, especially among males, from the 1940s through to the 1960s.



Source: d'Espaignet et al. 1991, AIHW unpublished data

Figure 1.2: *Major causes of death, age-standardised rates by sex, 1921 to 1992*

To a large extent this has held true for deaths from cancers, with small increases in the age-standardised death rates for males and females from 2.0 and 1.3 per 1,000 males and females in 1965, to 2.3 and 1.4 respectively in 1992. Despite this relatively small absolute increase in cancer death rates, because of the decrease in total mortality, the proportion of total standardised mortality attributed to cancers increased from 15% in 1965 to 27% in 1992.

For diseases of the circulatory system, the expectation was not borne out. Following a steady increase in mortality from cardiovascular diseases from the early 1900s, a phase of decline started in the late 1960s and has continued to the present. In 1968, the age-standardised cardiovascular disease death rates per 1,000 population were at their highest, at 8.1 deaths per 1,000 for males and 5.3 deaths for females. In 1992, the age-standardised death rates, at 3.6 per 1,000 for males and 2.4 for females, were less than half of those of 1968.

There have been considerable year-to-year variations in deaths from respiratory disease. The general trend was for rapid decreases in both sexes until the early 1950s. Male mortality then increased until about 1970, since when it has fallen back to below the level of the early 1950s. Female mortality from respiratory disease has decreased slowly over the entire period since the early 1950s.

The fall in rates of death from cardiovascular and respiratory diseases since the late 1960s has had a major impact on Australia's total mortality profile. Although most of the reduction in mortality in the early part of the century was among younger people, the reduction in the last 25 years has been mostly among the elderly.

That is not to say that there have not been any recent reductions in death rates at younger ages. Mortality from injury and poisoning has decreased substantially in recent years, lower mortality from road traffic injury (Section 2.6, page 100) having more than offset some increases in suicide rates in younger men (Section 2.7, page 107).

Mortality by State

In recent years, there have been substantial differences in death rates between the Australian States and Territories. Table S16, page 246, shows that the Australian Capital Territory has the lowest age-standardised mortality for both males and females and the Northern Territory the highest.

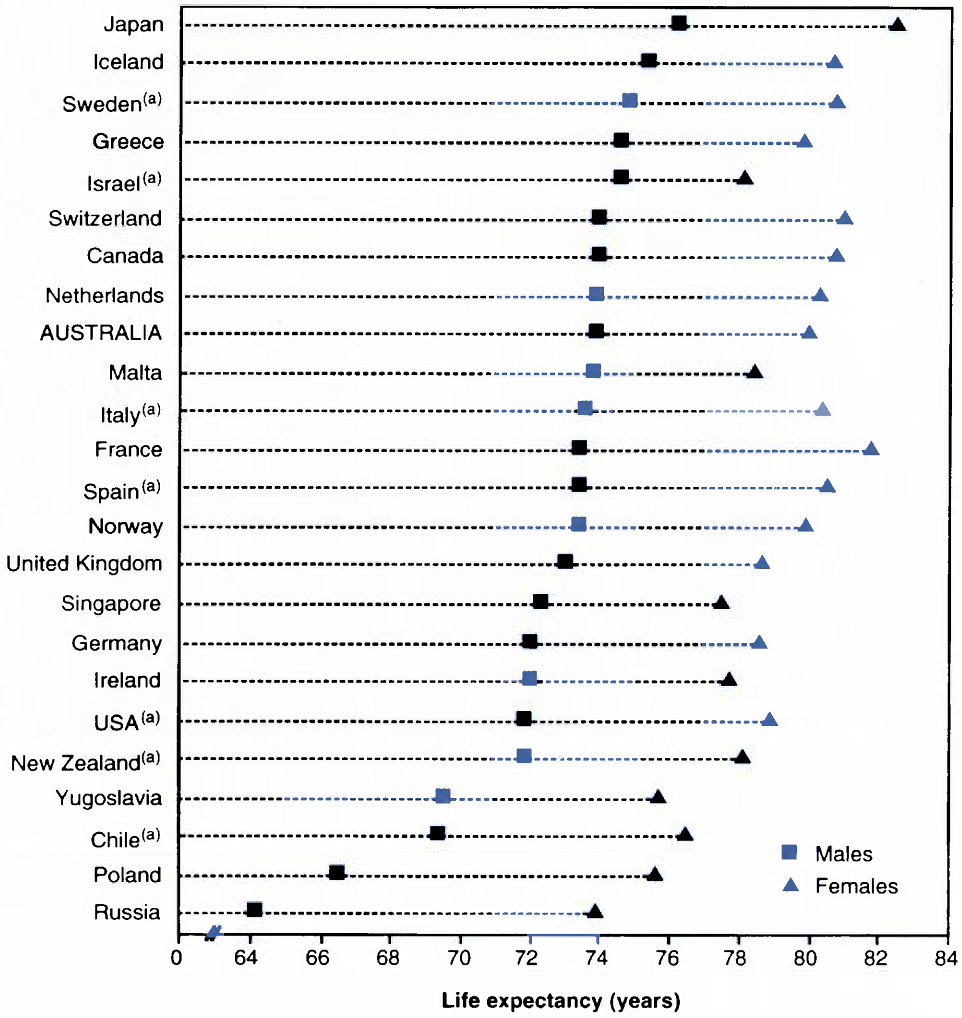
The much higher death rates for the Northern Territory than for the States and the Australian Capital Territory mainly reflect the much higher mortality of Aboriginal people, who make up 31% of the population in the Northern Territory. Reasons for death rates for Tasmania, which has the next highest rates, exceeding those in the Australian Capital Territory by 25% (males) and 26% (females), and other variations in death rates among States and Territories, have not been studied in detail.

Life expectancy

Life expectancy is the average number of years of life remaining to a person. It is usually calculated using age-specific death rates for a particular period.

An Australian boy born in 1992 can expect to live 74.5 years and a girl can expect to live 80.4 years. In 1920–22, life expectancy at birth was 59.2 years for boys and 63.3 years for girls.

The reductions in the death rates at the older ages, especially from diseases of the circulatory system, have led to significant improvements in life expectancy of adults. Between 1920–22 and 1960–62, the life expectancy of men aged 65 years increased from 12.0 to 12.5 years. This gain of 0.5 years over a 40 year period may be compared with a gain of 2.9 years over the 31-year period from 1960–62 to 1992 when life expectancy for men at age 65 reached 15.4 years.



(a) Chile, Israel, Italy, New Zealand, Spain, Sweden, USA 1989

Source: World Health Organization 1992, 1993

Figure 1.3: *Life expectancy at birth by sex, selected countries, 1990*

For women, life expectancy at age 65 improved by 2.1 years between 1920–22 (when it was 13.6 years) and 1960–62 (15.7 years). This compares with an increase in life expectancy of 3.5 years in the period from 1960–62 to 1992, when life expectancy for women at age 65 reached 19.2 years (Table S11, page 242).

Figure 1.3 compares expectation of life in Australia in 1990 with that in a number of other countries. Japan has the highest life expectancy at birth for both sexes. Australia occupies an intermediate position among OECD countries. The lower expectation of life in Eastern European countries has attracted much attention in recent years.

Box 1.2: More detailed analyses of mortality in Australia

More detailed analyses of mortality in Australia are presented in specialised series produced by the Institute. These include:

Mortality Series:

- *Trends in Australian mortality, 1921–1988*
- *Trends in Australian mortality—diseases of the circulatory system, 1950–1992*

Mortality Surveillance Series:

- *Mortality surveillance, Australia, 1979–1990*

Cancer Series:

- *Cancer in Australia, 1983–1985*
- *Cancer in Australia, 1986–1988*

1.2.2 Admission to hospital

In descending order of seriousness for the individual, the next indicator of health is admission to hospital.

Statistics relating to admission to hospital are discussed in Section 4.3, page 160. In this chapter, which describes the generally improving health of Australians, it is relevant to note that from 1982–83 until 1988–89 hospital admission rates fluctuated around 215 per 1,000 population per year; since then they have increased substantially, to 240 per 1,000 population in 1991–92 (Table 4.11).

The health of Australians has been improving throughout this period. The relation between health and use of hospitals has not been studied in detail, but the increasing rate of admissions has certainly been influenced by the increasing rate of same-day admissions. This in turn has reflected technological developments (see Section 4.7, page 180), the introduction of which has made some admissions worthwhile when formerly that would not have been the case. The extent to which same-day admission rates for minor surgery and admission rates for longer stays reflect increasing community expectations also has not been studied.

1.2.3 Seeing a doctor

The use of medical services is discussed in detail in Section 4.5, page 172.

Medicare statistics show that in 1992–93 Australians on average consulted a general practitioner 5.3 times and a specialist 0.9 times. The frequency of visiting doctors has risen slowly since 1984–85, when there were, on average, 4.1 general practitioner and 0.7 specialist consultations. Again it is not known how these increases relate to improvements in health and to increasing community expectations.

Use of medical services varies with sex and age (Figure 4.4, page 175). It is high in infancy and early childhood, decreasing to a minimum at 10 to 14 years. From then the number of services for men increases slowly with age. Women have much greater use of medical services during the childbearing years, but even after age 45 they continue to use more services than men do.

1.2.4 Disability and handicap

Impairment, disability, and handicap are consequences of disease. There were ABS surveys of disability in Australia in 1981, 1988 and 1993, using definitions related to the conceptual framework embodied in the World Health Organization's International Classification of Impairments, Disabilities, and Handicaps (ICIDH) (WHO 1980).

The conceptual framework used in the surveys was that disease or disorder or loss may lead to impairment, which in turn may lead to disability, and this in turn may lead to handicap.

An example of disease, disorder or loss is loss of a leg, whether congenital, accidental or as a result of disease. This can lead to impairment, defined as loss or abnormality of psychological, physiological or anatomical structure or function. In turn, this can cause disability, defined as disturbance to customarily expected activity, behaviour or performance, either directly or as a response by the individual to the impairment.

Handicap is social disadvantage resulting from disability or impairment. The presence or absence of handicap and its severity are consequences of the interaction between the underlying impairment (i.e. medical condition), individual behaviour and attitudes, and the resources and social opportunities and restrictions affecting the individual.

Disability and handicap in migrants are discussed in Section 1.3.2 and disability and handicap in Aboriginal and Torres Strait Islander peoples in Section 1.3.3 (page 26).

Disability

The 1993 ABS Survey of Disability, Ageing and Carers estimated that 18% of Australians (3.2 million people) were disabled in some way (see Box 1.3 for ABS definition of disability). The proportions of people reporting one or more disabilities rose with age (Figure 1.4, page 12). One or more disabilities were reported by 67% of people aged 75 years or more, compared with 7.0% at 0 to 14 years and 8.7% at 15 to 34 years.

The proportions reporting one or more disabilities were higher for males than for females except at ages 15 to 34 years (Figure 1.4). A higher proportion of males than females reported physical disabilities as the primary disabling condition at all ages (Table 1.1, page 14). On the other hand, a higher proportion of women than men reported primary disabling mental disorders at all ages from 15 onwards.

Box 1.3: ABS surveys of disability

The 1981 and 1988 ABS surveys on disability defined a person with a disability as having one or more of the following conditions which had lasted or were likely to last for six months or more:

- *loss of sight (even when wearing glasses or contact lenses)*
- *loss of hearing*
- *speech difficulties in native language*
- *blackouts, fits or loss of consciousness*
- *slowness at learning or understanding*
- *incomplete use of arms or fingers*
- *incomplete use of feet or legs*
- *long-term treatment for nerves or an emotional condition*
- *restriction in physical activities or in doing physical work*
- *disfigurement or deformity*
- *need for help or supervision because of a mental disability*
- *long-term treatment or medication (although still restricted in some way by the condition being treated (ABS 1990)).*

These conditions include impairments, disabilities, and a handicap, as defined in the WHO International Classification of Impairments, Disabilities, and Handicaps framework, and even some health conditions, and should perhaps be viewed as defining a wider population likely to contain people with a disability.

In the 1993 ABS Survey of Disability, Ageing and Carers, the list of screening questions for disability was expanded to include:

- *difficulty gripping and holding small objects*
- *long-term effects of head injury, stroke, or any other brain damage*
- *any other long-term condition resulting in a restriction.*

The ABS surveys defined a handicapped person as 'a disabled person aged 5 years or over who was further identified as being limited to some degree in his/her ability to perform tasks in relation to one or more of the following five areas: self-care, mobility, verbal communication, schooling, and/or employment'. Severity of handicap for people aged 5 years or over was assessed, for self-care, mobility, and verbal communication, as follows:

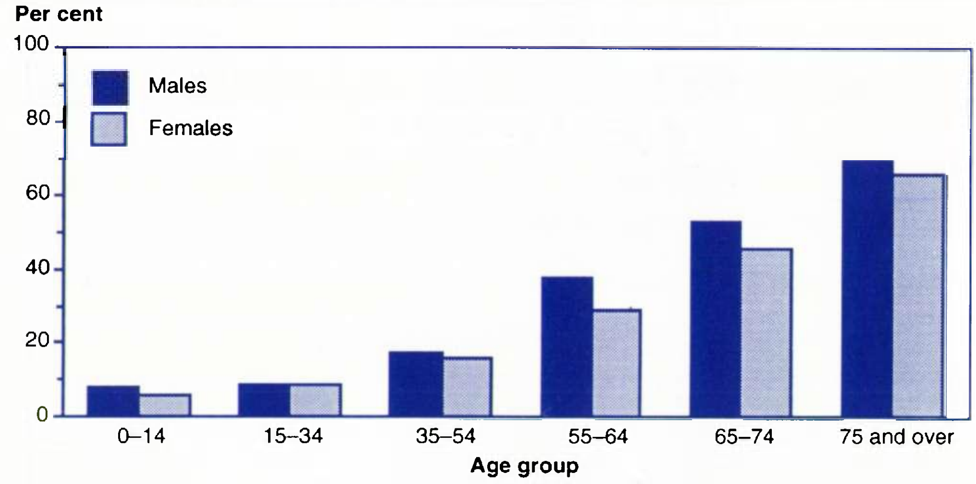
***severe handicap:** personal help or supervision are required or the person is unable to perform one or more of the tasks; in the 1993 survey this category was further divided into severe and profound handicap. In this section, the term 'severe handicap' refers to severe and profound handicap combined.*

***moderate handicap:** no personal help or supervision are required; but the person has difficulty in performing one or more of the tasks.*

***mild handicap:** no personal help or supervision are required and no difficulty is experienced in performing the tasks, but the person uses an aid, or has difficulty walking 200 metres or up and down stairs.*

All disabled children under the age of 5 years were regarded as being handicapped; the severity of their handicap was not assessed.

Note that these definitions of disability and handicap do not necessarily match those used in various government assistance programs. Australia's welfare 1993 discusses criteria used in various welfare programs in more detail.



Source: ABS 1993

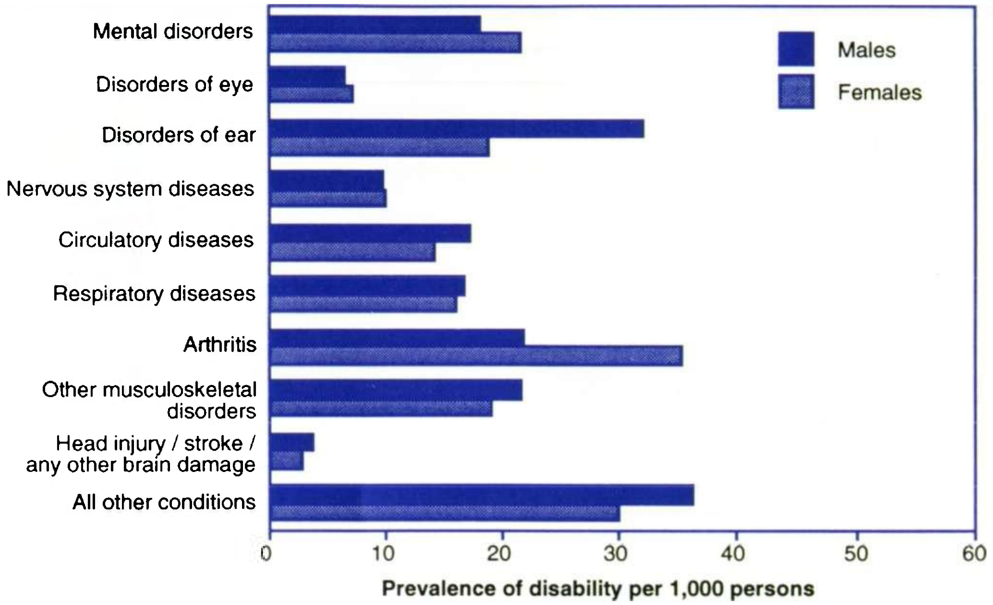
Figure 1.4: ***Prevalence of disability by age and sex, 1993***

The most frequently reported primary disabling conditions (see Figure 1.5) were those of the musculoskeletal system and connective tissue, with 4.9% of Australians (863,300 people) being disabled by these conditions. The next most frequently reported primary disabling conditions were hearing loss (2.6% or 450,000 people) and mental disorders (2.0% or 353,500 people). Higher proportions of females than males reported musculoskeletal conditions, largely reflecting the preponderance of females among older people, whereas higher proportions of males than females reported hearing loss and circulatory-related disability (Table 1.1). In young adults, the leading causes of disabilities were mental disorders, then respiratory diseases, whereas in children, respiratory diseases were the leading cause (ABS 1993). The breakdown of primary disabling conditions by age and sex is shown in Table 1.1.

Handicap

The 18% of Australians who were disabled in some way in the 1993 ABS survey included 14.2% of Australians (2.5 million people) classified as handicapped, of whom 721,000 (4.1% of the population) were classified as severely handicapped. Of people aged 75 years or more, 61% (496,600 people) reported that they were handicapped, compared with 5.8% of those aged 15 to 34 years.

The age-specific pattern and sex differentials for handicap are similar to those for disability, with more males than females reporting handicap at most ages below 75. However, when severity of handicap is taken into account, a different pattern emerges (Figure 1.6, page 15). For all age groups from 15 onwards, more females than males were classified as severely handicapped. This is the level at which assistance is needed for activities of daily living such as self-care, mobility and communication.



Source: ABS 1993

Figure 1.5: ***Primary disabling conditions, 1993***

The most frequent handicap was in mobility, reported by 10.4% of Australians (1.8 million people) and by 68% of those with a handicap (ABS 1993). The next most frequently reported handicaps were in employment (reported by 8.5% of Australians and by 60% of those with a handicap), self-care (5.7% and 37%) and communication (2.9% and 19%). Note that people may be handicapped in more than one way, and are thus counted in several of these categories.

Of those who were severely handicapped, 78% were handicapped in self-care, 93% in mobility and 31% in communication. The prevalence of severe handicap rises steeply with age, from 2.5% in children aged 5 to 14 years to 22% and 33% in males and females aged 75 years or more respectively.

Changes in prevalence of disability and handicap from 1981 to 1993

Prevalences of disability and handicap reported in ABS publications from the 1993 survey are not directly comparable with those from the earlier surveys because of changes to definitions (see Box 1.3). For the analysis that follows, estimates have been derived from the 1993 survey data, using definitions common to the 1981 and 1988 surveys.

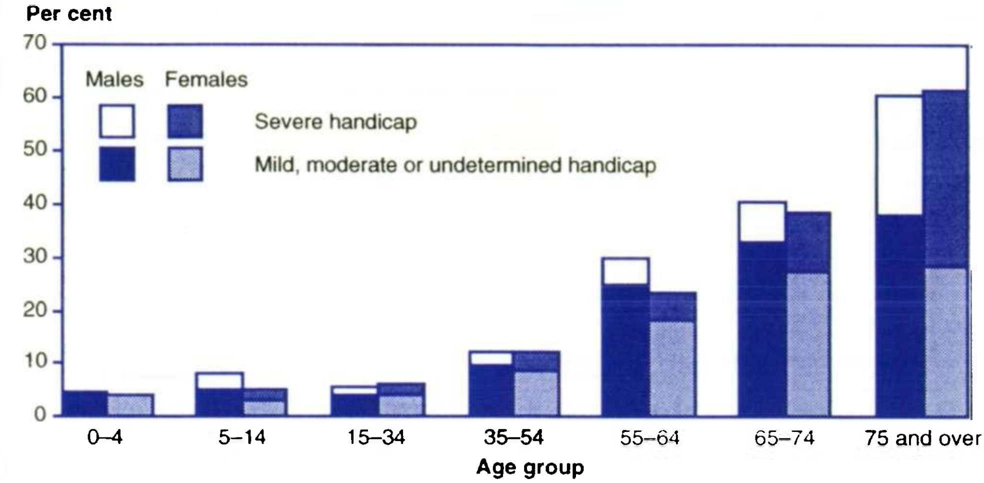
The age-standardised prevalence of disability increased substantially between 1981 and 1988, from 14.9% to 16.8% for males, and from 12.8 to 14.4% for females (Figure 1.7, page 15). The increase in the reported prevalence of handicap was much greater, from 9.4% to 13.7% for males and from 8.7% to 12.2% for females. In contrast, the prevalence of severe handicap did not increase for men between 1981 and 1988, and increased by only a small amount for women.

Table 1.1: *Primary disabling conditions, age-specific proportions (%) by sex, 1993*

	Age group (years)						
Primary disabling condition	**0–14**	**15–29**	**30–44**	**45–59**	**60–74**	**75 and over**	**All ages[(a)]**
Males							
Mental disorders							
Mental psychoses	–	0.3	0.4	0.4	0.5	2.8	0.4
Other mental disorders	2.2	1.4	1.1	1.6	1.2	1.1	1.5
All mental disorders	2.2	1.6	1.4	2.0	1.7	4.0	1.8
Physical conditions							
Disorders of eye and adnexa	0.2	0.5	0.6	0.8	1.5	3.2	0.7
Disorders of ear and mastoid process	0.8	1.5	3.4	5.9	10.3	13.9	3.2
Nervous system diseases	0.5	0.7	1.2	1.4	1.8	3.3	1.0
Circulatory diseases	0.1	0.1	1.0	5.6	8.3	10.7	1.7
Respiratory diseases	2.0	0.9	1.0	2.5	4.9	4.5	1.7
Arthritis	–	0.4	2.0	5.9	8.3	13.7	2.2
Other musculoskeletal disorders	0.2	1.1	3.4	5.3	4.7	2.7	2.2
Head injury / stroke / other brain damage	0.1	0.3	0.2	1.1	0.9	1.0	0.4
All other conditions	2.2	1.7	3.4	7.3	10.0	12.0	3.6
All physical conditions	6.1	7.1	16.2	35.7	50.7	65.0	16.6
All conditions	**8.3**	**8.7**	**17.7**	**37.7**	**52.4**	**68.9**	**18.4**
Females							
Mental disorders							
Mental psychoses	–	0.2	0.4	0.4	0.6	3.9	0.5
Other mental disorders	1.0	1.5	2.2	2.4	2.1	2.0	1.7
All mental disorders	1.0	1.7	2.6	2.7	2.6	6.0	2.2
Physical conditions							
Disorders of eye and adnexa	0.2	0.1	0.4	0.8	2.3	5.6	0.7
Disorders of ear and mastoid process	0.8	1.1	1.9	2.3	5.2	5.9	1.9
Nervous system diseases	0.5	0.7	1.0	1.4	1.6	3.5	1.0
Circulatory diseases	–	0.4	0.5	2.9	4.9	10.2	1.4
Respiratory diseases	1.7	1.3	1.2	2.2	2.8	2.4	1.6
Arthritis	–	0.6	2.4	7.4	15.5	16.7	3.5
Other musculoskeletal disorders	0.3	0.9	3.0	4.0	3.5	3.8	1.9
Head injury / stroke / other brain damage	0.1	0.2	0.2	0.3	1.0	1.0	0.3
All other conditions	1.1	1.7	2.7	5.4	6.4	10.3	3.0
All physical conditions	4.6	7.0	13.2	26.6	43.1	59.4	15.4
All conditions	**5.6**	**8.7**	**15.8**	**29.3**	**45.7**	**65.3**	**17.6**

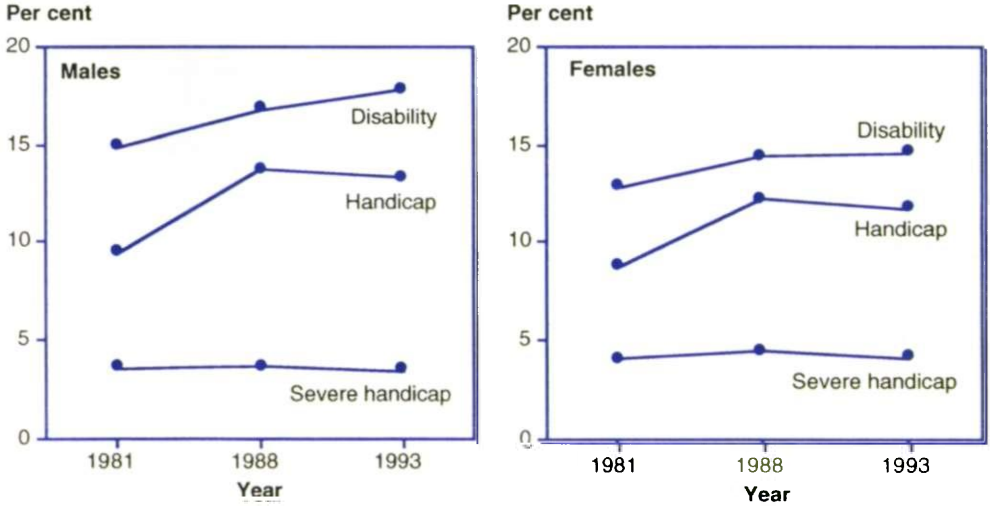
(a) Crude rate.

Source: ABS 1993



Source: ABS 1993

Figure 1.6: ***Prevalence of handicap by age, sex and severity, 1993***



Note: Age standardised to total Australian population, 1988. Note that 1993 prevalence rates are derived on the basis of the 1988 form of the disability screening question.

Source: AIHW, from unpublished data supplied by ABS

Figure 1.7: ***Trends in age-standardised prevalence of disability, handicap and severe handicap, by sex, 1981 to 1993***

For both sexes, the age-standardised prevalence of disability increased slightly between 1988 and 1993 (Figure 1.7). In contrast, the age-standardised prevalence of handicap declined slightly, from 13.7% to 13.3% for males and from 12.2% to 11.7% for females. The prevalence of severe handicap also declined slightly, to become very close to its levels in 1981 (Figure 1.7). For both sexes, the prevalence of severe handicap increased between 1988 and 1993 for people aged less than 40 years, but decreased slightly for people of 40 years and over.

Although the prevalence of disability has increased slightly and that of handicap decreased slightly between 1988 and 1993, prevalences for 1993 remain close to those for 1988, and are substantially higher than those found in 1981.

Possible factors involved in the substantial increase in reported disability and handicap prevalence levels during the 1980s have been discussed in detail by Mathers (1991). Self-assessment of limitations or need for assistance in relation to specified activities may have changed in line with changing community perceptions of disability and handicap during the 1980s. Changing attitudes may have resulted in people being more aware of disabling conditions, or more willing to report such conditions, and may also have affected how people interpreted 'need' and 'difficulty', concepts used to determine presence and severity of handicap. Another factor may have been changes in the availability of aids for disabled people, as use of an aid is a determinant of mild handicap. Government programs for provision of aids expanded during the 1980s (AIHW 1992) and may have contributed to the increase in self-reported prevalence of handicap.

Severity of handicap was assessed on the basis of limitations in self-care, mobility and communications. A handicapped person could report limitations in more than one of these areas.

The prevalence of limitations in these three areas increased substantially between 1988 and 1993 for severely handicapped people (Table 1.2). At the same time the prevalence of severe handicap decreased slightly (Figure 1.7). Severely handicapped people reported limitations in more areas in 1993 than in 1988; there was a particularly large increase (93%) in the proportion of people reporting limitations in communication. There was also a substantial increase in limitations of communication reported by moderately handicapped people. Mildly handicapped people reported fewer limitations in self-care and communication, but there was little change in their reported limitations in mobility.

Are Australians becoming more disabled and handicapped?

Olshansky et al. (1991) have argued that there is 'trade-off between lower mortality and morbidity from fatal diseases, for a small increase in life expectancy and an accompanying increase in the duration of time for the expression of non-fatal diseases of ageing'. Thus 'reductions in the risk of death from fatal diseases could shift the distribution of disability away from fatal diseases to non fatal diseases of ageing'.

Gruenberg (1977) and Kramer (1980) expressed concern that improvements in medical care may have increased the survival of chronically ill and disabled people thus resulting in higher prevalence of disability; by staying alive longer, such people may have more years for their illness to advance in severity and more time to develop other chronic illness.

Table 1.2: *Area of handicap by severity, handicapped persons aged five years or more, 1981, 1988 and 1993*

	Severity of handicap			
Year / Area of handicap	**Severe**	**Moderate**	**Mild**	**Total**
		Prevalence (per cent)		
1981				
Self-care	1.91	1.51	0.18	3.60
Mobility	2.98	1.33	1.79	6.10
Communication	0.51	0.20	1.02	1.72
1988				
Self-care	2.63	2.86	0.52	6.01
Mobility	3.66	2.96	4.20	10.81
Communication	0.72	0.27	1.78	2.77
1993[a]				
Self-care	3.43	1.94	0.34	5.71
Mobility	4.09	2.05	4.28	10.41
Communication	1.39	0.39	1.12	2.89
		Per cent increase		
1981–1988				
Self-care	37.5	90.1	183.3	66.9
Mobility	22.9	122.8	133.9	77.3
Communication	42.5	40.3	74.0	60.9
1988–1993				
Self-care	30.4	–32.1	–34.6	–5.0
Mobility	11.7	–30.7	1.8	–3.7
Communication	92.6	43.1	–37.3	4.3

(a) The 1993 handicap rates are derived on the basis of the 1988 form of the disability screening question.

Source: ABS 1982, 1988 and unpublished data

International evidence suggests that increases in disability prevalence began in different countries at various times in the late 1960s and 1970s. This was also the time when mortality rates at older ages began to decline significantly, and when secondary prevention (that is, the early detection of disease and subsequent intervention to slow its progress) was emphasised for many major fatal and non-fatal diseases. In addition, greater awareness of chronic conditions due to improved diagnostic techniques, more frequent contacts with the health care system and, perhaps, better communication by doctors to patients have probably led to increased reporting of chronic disease conditions in surveys (Colvez & Blanchet 1981) and to behaviour modification. For example, over the last two decades there has been substantially increased screening for and treatment of high blood pressure which may have led to more people knowing of their disease and restricting their activity, without any change in the underlying incidence or prevalence of high blood pressure.

Data from the Australian disability surveys suggest there has been little change in age-specific prevalences of disability and handicap over the last five years, although the numbers of disabled and handicapped people are increasing as the population ages.

Many researchers have noted that there are major differences between the causes of disability and of mortality (Crimmins 1990). The control of risk factors associated with the major chronic diseases which are today mostly fatal diseases may have a larger effect on mortality rather than on disability (Manton 1987). A further question is whether lifestyle improvements would also reduce incidence of ageing-related debilitating diseases (osteoporosis, osteoarthritis, sensory impairments, etc.). If these reductions were not to happen, the prevalence of disabilities is likely to increase even further. It is striking that there is no strategy aimed at avoiding debilitating diseases such as arthritis. This is in stark contrast with the strategy for cardiovascular diseases (Adams 1987). These are emerging challenges for Australian and other societies in which life expectancies are now very high and in which the population is ageing.

1.2.5 Cost of illness

Disease costing, or cost of illness (COI) analysis, is used to estimate the cost impact of disease on the community. By measuring the impact of disease in economic terms, it presents yet another picture of the way in which diseases affect the community. The main uses of cost of illness data are in providing an economic justification for disease control action and an input into evaluating the cost-effectiveness of interventions for the purpose of priority setting.

The Australian Institute of Health and Welfare started its COI analysis in 1992, as part of a broader approach to evaluation, the Disease Costs and Impact Study (DCIS) (Carter 1992).

As the basis for determining priorities for health interventions, particularly preventive interventions, the approach used in DCIS requires information on the public health significance of health problems, or burden of suffering. It also requires information on the theoretical benefit (efficacy) and the practical benefit (effectiveness) of programs addressing these problems. Lastly, it requires information on the relative cost-effectiveness (efficiency) of individual measures aimed at achieving the benefit.

Illness has both direct and indirect costs. Direct costs are the money spent on diagnosing, treating and caring for the sick and the money spent on prevention. They are the costs of forgone alternatives: if there were no illness, money could be put to other uses. Indirect costs are the value of the output lost because people become too ill to work or die prematurely.

The DCIS aims to provide soundly based estimates for the direct costs of a range of diseases. It has developed formulae to apportion known aggregate expenditures in the various health sectors (hospitals, nursing homes, medical services, pharmaceuticals and allied health professionals) among diseases. For hospitals and nursing homes, this is based on diagnoses given in the hospital morbidity data collections. For medical services, pharmaceuticals and allied professionals' services, it is based on the National Survey of Morbidity and Treatment in General Practice.

Although it is possible to measure the economic burden caused by illness and premature death, disease costing is not yet able to provide a comprehensive assessment of the impact of disease on the total welfare of society. This would require a dollar measure for the impact of anxiety, pain and suffering, for which satisfactory measures have yet to be developed.

Box 1.4: Methods and limitations of cost of illness (COI) studies)

The methods and applications of COI studies are the subject of spirited debate among health economists. There are dangers in using them to set priorities and choose courses of action. COI studies may be seen by policy makers as a pragmatic alternative to cost-effectiveness or cost-utility analysis. Such studies should not be used to justify further expenditure simply because money is currently devoted to treatment of a disease; decisions on the allocation of health resources should depend on the costs and benefits of management options (Drummond 1992). Allocation on the basis of cost alone is unlikely to lead to resources being used most efficiently.

Estimating indirect cost of illness is particularly difficult and contentious (Collins & Lapsley 1991). There are two principal methods. The first, used in most studies, is called the human capital or output accounting approach. An employed person is seen as producing output over the years that is valued at that person's earnings. The main criticisms of this method are that it excludes intangibles, counts only earnings, and undervalues some groups relative to others where earnings do not accurately reflect a person's value or ability to produce. Thus men are more highly valued than women, and middle-aged people more highly valued than the young or the old.

The second approach, the willingness-to-pay method, values human life according to the amount people are willing to spend to obtain reductions in the probability of death. It could be helpful in indicating how individuals value health and life, in deriving social preferences regarding public policy, and in assessing the burden of pain and suffering. All these have an intangible quality that is less amenable to evaluation in terms of the monetary value of resources used or forgone (Rice et al. 1990). One objection to this method is that the values of individual lives depend on income, with the rich able to pay more than the poor. Also, it is exceedingly difficult for people to place a value on small reductions in the probability of death; lifetime earnings as estimated by the human capital method may at least be a lower bound to a person's willingness to pay for a decreased risk of death.

The strengths and weaknesses of these methods are discussed fully by Hodgson & Meiners (1982) and by Hodgson (1983).

The human capital and willingness-to-pay methods are not simply alternatives. They measure different concepts and can each provide insights into particular circumstances. The human capital approach has conceptual limitations, but has the advantage of being able to make use of reliable statistics.

Cost-of-illness studies usually address a different research question from micro-economic evaluations, and the inclusion of indirect costs is more widely accepted in the disease costing context. Most micro-economic evaluations in the health area, for example, prefer not to cost the value of life, but rather to put direct costs over 'life years gained' or 'quality adjusted life years gained' as the decision index.

Standards for cost-of-illness studies have been set by a USA Task Force on Disease Costing, to make studies in different centres more comparable and to permit evaluation of cost estimates presented in publications (Hodgson & Meiners 1982).

Table 1.3: *Cost of diseases of the circulatory system, by sector of expenditure, 1989–90 ($'000)*

Sector of expenditure	Hypertensive disease	Ischaemic heart disease	Cerebro-vascular disease	Other circulatory diseases	All circulatory diseases
Public hospitals	15,824	298,553	131,229	331,744	777,350
Private hospitals	4,620	35,092	23,620	84,667	147,999
All hospitals	20,444	333,645	154,849	416,411	925,349
Nursing homes	13,636	35,358	307,606	163,239	519,839
Medical	152,786	43,137	11,816	107,178	314,917
Pharmaceutical	247,162	62,760	8,305	94,288	412,515
Allied professionals	31,569	7,084	4,485	27,411	70,549
Total direct costs	**465,598**	**481,985**	**487,060**	**808,526**	**2,243,169**
Sick leave[(a)]	74,727	67,432	27,475	108,093	277,727
Foregone earnings[(b)]	13,116	540,372	122,891	188,302	864,681
Total indirect costs	**87,843**	**607,804**	**150,366**	**296,395**	**1,142,408**
Total costs	**553,441**	**1,089,788**	**637,426**	**1,104,922**	**3,385,577**

(a) Includes sick leave associated with a hospital and/or medical attendance.

(b) Net present value using 5% discount rate for earnings foregone during working age 15 to 64, including age-specific workforce participation and sex-specific average weekly earnings.

Source: AIHW unpublished data

Table 1.3 gives cost of illness estimates from the DCIS for diseases of the circulatory system in Australia, 1989–90. The identified cost of these diseases exceeds $3,300 million per year: $2,200 million is direct cost and $1,100 million is indirect cost. Ischaemic heart disease is the major contributor to both, especially to indirect cost.

Uses of cost of illness studies

Godfrey, Hardman & Maynard (1989) have noted: 'Ideally, as part of the exercise of ranking health priorities, it would also be useful to compile information on morbidity, costs and other indicators of the burden of illness. As well as providing information that would be needed to build improved indicators, the robustness of ranking priorities by life years lost could be tested.'

COI studies can be useful for identifying and analysing how resources are currently allocated among different types of costs, among different types of services and among different diseases. On their own, however, they cannot show whether the resource allocation is efficient. This can be done only by using evaluation techniques that combine both costs and outcomes (such as the DCIS or micro-economic evaluations).

Although estimating indirect cost is contentious (see Box 1.4), COI studies can be useful to researchers and health planners by providing data on the cost side of the cost-effectiveness equation for a later economic evaluation (Davey & Leeder 1993). This is why the DCIS undertakes COI studies. COI calculations can also provide the base against which new interventions can be assessed (Drummond 1992). Planners can compare the relative burden of different diseases in considering priorities for prevention. DCIS provides a method for ranking large numbers of projects.

COI estimates can be used to model the 'do nothing' or current case option, and to investigate the impact of different treatment practices. The latter follows naturally from separately identifying the components of costs (such as hospital, medical, pharmaceutical, nursing home and allied health costs). Comparisons of results of COI studies undertaken in different locations may also assist such analysis (Drummond 1992).

COI studies can also be useful to health planners who wish to know the relationship between the incidence or prevalence of disease and the consequent use of health services. Planners may wish to identify what potential changes in use might be achieved by prevention or to estimate possible cost savings.

Such estimates need to be carefully interpreted. They are usually only indicative. They are not estimates of immediately realisable savings, but rather 'opportunity cost' estimates measuring resources devoted to the treatment of preventable disease that could be available for treatment of non-preventable diseases. Conversion of 'opportunity cost savings' into financial savings involves a number of other practical and theoretical considerations.

COI data can also be useful for researchers and planners who wish to know where in the health system expenditures are incurred, such as by type of illness, and by age and sex. Use of such information to help analyse equity and ethical issues would require a wide knowledge of the health care financing system so that any recommendations could be placed in context.

1.3 Health and ill-health of special populations

1.3.1 Mothers and infants

Live births and birth rates

There were 264,151 live births registered in Australia in 1992, 2.7% more than the 257,247 live births in 1991, and 4.4% fewer than the peak annual registration of 276,362 live births in Australia in 1971. After declining to 223,129 in 1979, annual numbers gradually increased to 1990, fell slightly in 1991, then rose again in 1992.

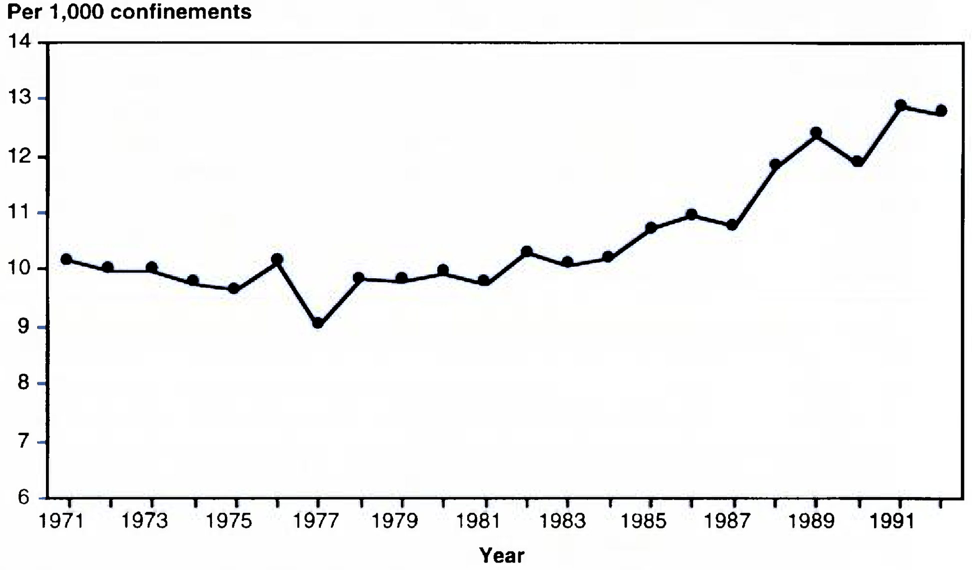
The crude birth rate relates the number of live births in any one year to the total population size. This rate has declined from 21.7 per 1,000 people in 1971, to 14.9 per 1,000 in 1991, and 15.1 per 1,000 in 1992.

Age-specific birth rates express the number of women in selected five-year age groups giving birth in a year as a proportion of the number of women of the same age group in the population. Recent trends in these rates have differed with age. For teenagers of 15 to 19 years, the birth rate has increased slightly from its historical low of 20.3 live births per 1,000 women in 1988, to 22.1 per 1,000 in 1991, and 21.9 per 1,000 in 1992. On the other hand, the birth rates for women in their twenties have continued to decline to reach their lowest levels ever in 1991 (75.0 per 1,000 for women aged 20 to 24 years, and 132.0 per 1,000 for women aged 25 to 29 years), rising slightly in 1992 (74.9 per 1,000 for women aged 20 to 24 years, and 132.6 per 1,000 for women aged 25 to 29 years). Age-specific birth rates for older women have generally increased in recent years, reflecting the trend for some women to defer child-bearing until their thirties, or even later. Women aged 30 to 34 years had their lowest rates in the mid-1970s, those aged 35 to 39 in the late-1970s, and those aged 40 to 44 in the mid-1980s (Table S2).

Multiple births

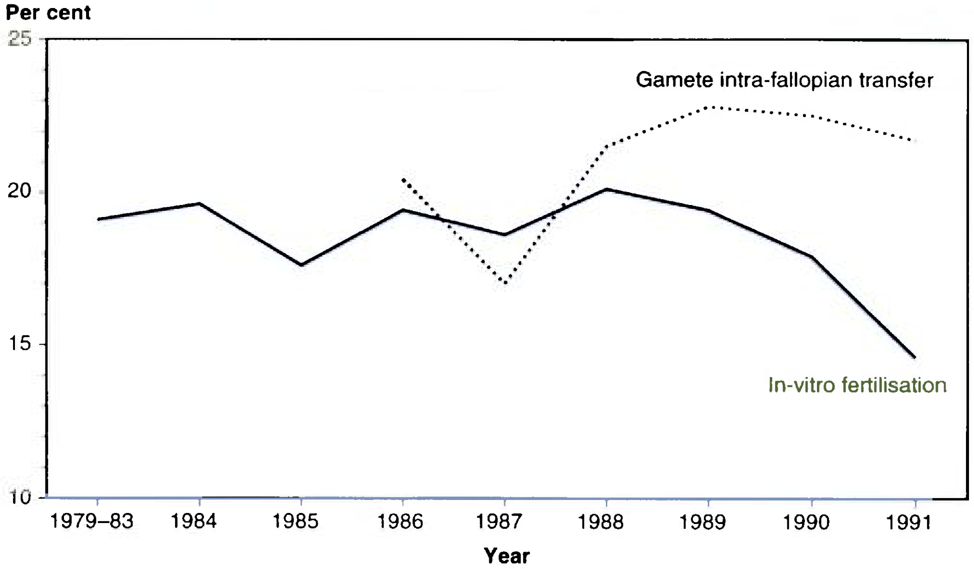
Twin confinements have increased since the mid-1970s, and reached their highest rate ever in Australia in 1991 when there were 3,266 twin confinements among 253,861 total confinements, a rate of 12.9 per 1,000 confinements (Figure 1.8). In 1992 there were 3,323 twin confinements among 260,669 confinements, a rate of 12.7 per 1,000 confinements. Because multiple births increase with advancing maternal age up to the late thirties, rates of multiple births will be influenced by changes in maternal age distribution. Another important factor contributing to the higher rates of multiple births in the last decade has been the increasing use of assisted conception (in-vitro fertilisation and related techniques) to treat infertile couples.

In 1991, assisted conception accounted for 9% of twin confinements in Australia and about 40% of triplets. An unknown proportion of other multiple births occurs after fertility drugs are used independently of assisted conception. Among the 8,239 pregnancies resulting in births since assisted conception began in Australia in 1979, twins occurred in 19.4%, triplets in 3.3%, and other multiple births in 0.3%. These multiple births usually follow transfer of more than one embryo into the uterus, or more than one egg into the fallopian tube, in the course of the various treatment procedures. In the past few years, the policy of reducing the number of embryos or eggs transferred during assisted conception has been partly effective in reducing the incidence of multiple births (Figures 1.9 and 1.10) (National Perinatal Statistics Unit and the Fertility Society of Australia 1993).



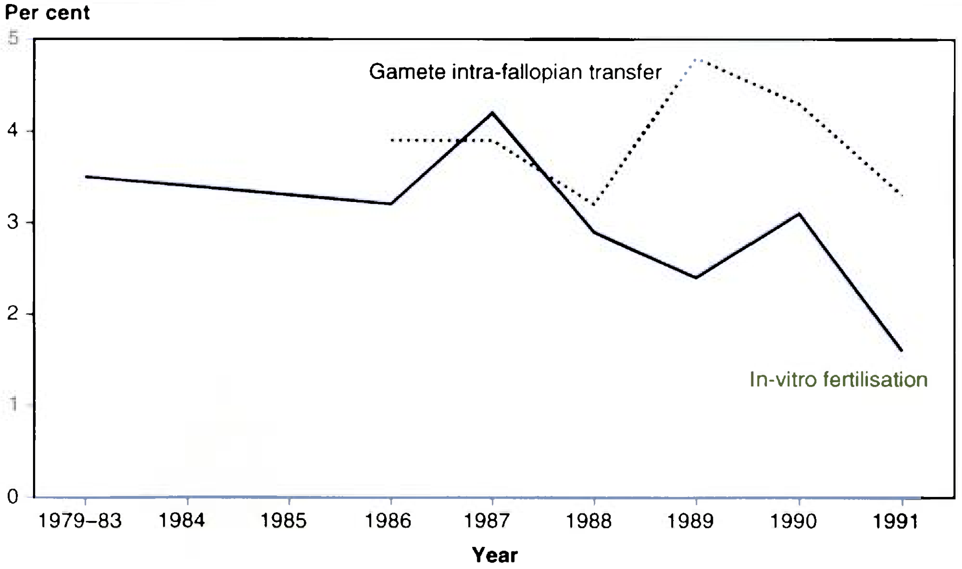
Source: AIHW National Perinatal Statistics Unit

Figure 1.8: *Twin confinements, Australia, 1971 to 1992*



Source: AIHW National Perinatal Statistics Unit

Figure 1.9: ***Twin pregnancies of at least twenty weeks gestation after assisted conception, Australia and New Zealand, 1979–83 to 1991***



Source: AIHW National Perinatal Statistics Unit

Figure 1.10: ***Triplet pregnancies of at least twenty weeks gestation after assisted conception, Australia and New Zealand, 1979–83 to 1991***

Termination of pregnancy

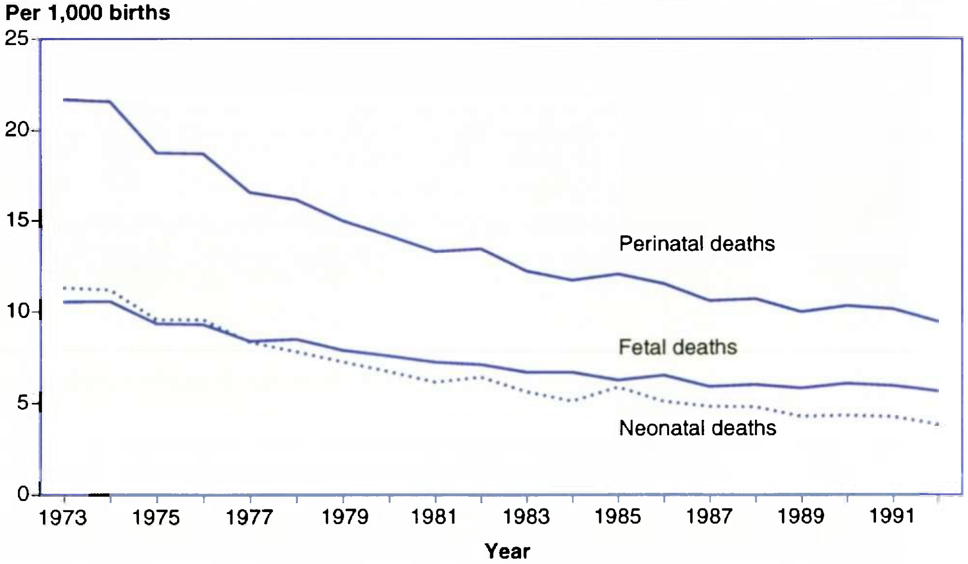
National information on fertility patterns is lacking because only South Australia and the Northern Territory collect population-based data on induced abortions. In South Australia in 1989, there were 4,342 abortions and 19,610 live births; thus 18% of the pregnancies resulted in abortions (Chan & Taylor 1991). Almost 50% of teenage pregnancies were terminated.

Perinatal mortality

The perinatal mortality rate has declined markedly in the last two decades, to 9.4 perinatal deaths per 1,000 total births in 1992, the lowest rate ever achieved (Figure 1.11, page 24). Foetal deaths (5.6 per 1,000 total births) accounted for 59.5%, and neonatal deaths (3.8 per 1,000 live births) accounted for 40.5% of perinatal deaths. The perinatal death rate for males (10.1 per 1,000 total births) is consistently higher than for females (8.8 per 1,000 total births).

Maternal mortality

For many years the National Health and Medical Research Council (NHMRC) has published triennial reports on maternal mortality. The latest report covering the triennium 1988–90 records, for the first time since the series started, an increase in maternal mortality, from 11.8 deaths per 100,000 live births and stillbirths in 1985–87 to 12.7 in 1988–90. There was also an increase, from 4.4 to 4.9 deaths per 100,000, in the direct maternal mortality rate, that is, in deaths resulting from obstetric complications (NHMRC 1993).



Source: AIHW National Perinatal Statistics Unit

Figure 1.11: ***Fetal, neonatal and perinatal death rates, 1973 to 1992***

Maternal mortality in Aboriginals and Torres Strait Islanders is discussed in Section 1.3.3 (page 26).

1.3.2 Migrants

The 1986 Census showed that 21% of Australians were born outside Australia and that 11% were born in countries where English was not the main language.

Until recently, much of what has been known on the health of migrants in Australia has been based on mortality data or on small surveys conducted to elicit information on specific ethnic groups (Reid and Trompf 1990). Although these surveys have provided information on the health of these groups, there has been no global picture of migrant health. In 1991–92, in response to the need for fuller understanding of migrant health, the Institute undertook a review of the health of people born outside Australia relative to that of Australian-born people (Donovan et al. 1992).

In conducting the review, the Institute attempted to provide as broad a picture of migrant health as possible. Where these existed, national mortality and morbidity data collections and surveys were used as sources of information on the health status of migrants.

The review found that migrants generally enjoyed better health, in terms of mortality and morbidity, than people born in Australia.

Mortality

At 15 to 74 years, most migrant groups had lower, and in many groups significantly lower, total mortality than the Australian population as a whole. For both sexes, mortality of people born in Australia was 3% higher than the mortality in the Australian population as a whole.

A trend analysis for three periods—1980–82, 1984–86 and 1987–89—confirmed the continuing relatively low mortality of several of the major migrant groups, particularly Greeks, Italians, Central and South Americans, Vietnamese and Yugoslavs. Age-specific death rates for each ethnic group generally decreased between 1980–82 and 1987–89.

Hospitalisation

Because of a lack of national data, 1986 New South Wales data on hospitalisation were used to provide a partial picture of morbidity patterns among the different ethnic groups.

After adjusting for the effect of age, it was found that people born outside Australia were less likely to be hospitalised than those born in Australia. This finding is in keeping with the finding of relatively low mortality in migrants. There is no evidence that it includes a component representing differential access to hospital care.

The analysis in men produced some novel findings. Men born in Egypt, Asia (other than Kampuchea, Laos, and Vietnam), and the Middle East had the highest level of hospitalisation for ischaemic heart disease. Those born in Canada and the United States experienced the highest levels for cerebrovascular disease, at the same time having among the lowest levels of hospitalisation for all other diseases of the circulatory system.

Women born in the Middle East experienced the highest level of hospitalisations for all causes, but this finding was heavily influenced by pregnancy and birth-related admissions. When these conditions were excluded, women from the Middle East ranked considerably lower, and women born in Australia had the highest admission rates.

Again there were some new findings. For example, women born in the Middle East experienced the highest level of hospitalisation for ischaemic heart disease, and women born in Asia experienced the lowest rates of hospitalisation for almost all causes. As was found for men, women born in Canada and the United States had the highest level of hospitalisation for cerebrovascular disease, at the same time showing the lowest level for ischaemic heart disease.

Disability and handicap

In the 1988 ABS Survey of Disabled and Aged Persons, a person was classified as disabled if he or she suffered from one of a group of impairments lasting six months or more, and as handicapped if limited in ability to perform certain everyday tasks. Further detail is given in Box 1.3 on page 11.

In this survey, Australian-born people had the highest prevalences of disability and handicap. Among migrants, those born in Europe had the highest prevalences and those born in Asia and the Middle East the lowest (d'Espaignet & van Ommeren 1992). Migrants from Italy and Greece had particularly high prevalences of self-reported severe handicap (see Table 1.4).

Risk factors in migrants

Bennett (1993) analysed data from the 1980, 1983 and 1989 Risk Factor Prevalence Surveys to compare the levels of biomedical and behavioural risk factors for cardiovascular disease of migrant and Australian-born participants. Differences were reported between migrant groups and Australian-born, particularly for systolic blood pressure, body mass index and behavioural risk factors. After adjusting for age and study design factors, migrants generally had lower mean systolic blood pressure and higher body mass index than their Australian-born counterparts. Male migrants were generally more likely to smoke than Australian-born males, and both men and women born overseas were more likely to be physically inactive.

The risk factor profiles of migrants were an insufficient explanation of their lower cardiovascular mortality. Systolic blood pressure was found to be the best single explanatory factor for variation in cardiovascular mortality among men, and smoking prevalence was the best among women. There were no clear differentials in blood lipids, and the evidence suggests that blood lipids have made little contribution to the lower cardiovascular mortality among Australia's migrants.

Nutritional risk factors in migrants are discussed in Section 1.4.1.

1.3.3 Aboriginal and Torres Strait Islander people

Over the past two decades, there has been a significant improvement in many aspects of the health of Aboriginal and Torres Strait Islander people, for brevity referred to as Aboriginals. Higher life expectancy, reduced infant mortality and a lower burden of infectious and parasitic diseases are all evidence of improvement. However, as reflected in rates of hospitalisation, maternal mortality and disability, and in continuing high mortality in adults, the burden of disease in Aboriginals continues to be higher than in non-Aboriginal Australians. This burden is likely to continue until effects on Aboriginal health of socioeconomic factors such as unemployment and poor housing can be eliminated.

Table 1.4: ***Age-adjusted disabled, handicapped and severely handicapped ratios, by country/ region of birth and sex, persons aged 15 to 74***

Sex / Region of birth	Disabled	Handicapped	Severely handicapped
Total Australian population	*100*	*100*	*100*
Men			
Australia	105	104	100
Asia and Middle East	61	64	63
Europe			
Greece	122	136	214
UK and Ireland	94	92	79
Italy	97	94	164
Yugoslavia	95	113	131
Other Europe	94	81	94
Other countries	74	72	69
Women			
Australia	102	100	97
Asia and Middle East	56	64	87
Europe			
Greece	134	149	187
UK and Ireland	105	104	87
Italy	97	106	170
Yugoslavia	91	96	112
Other Europe	105	108	102
Other countries	95	91	118

Source: Modified from Donovan et al. (eds) 1992

Some of the data in this section relate to parts only of the Aboriginal population, where data for the entire Aboriginal population are not available. In these instances it is not possible to calculate data for the non-Aboriginal population by subtraction from the corresponding data for the total Australian population. The comparisons presented are thus of the Aboriginal population and of the total Australian population.

Mortality

Age-specific death rates

Death rates of Aboriginals greatly exceed the corresponding total Australian rates at all ages (Table 1.5). The ratio of age-standardised mortality rates is 2.8 for males and 3.3 for females (Figure 1.12, page 29).

Table 1.5: *Age-specific death rates and rate ratio by sex, Aboriginal and total Australian populations, 1990–92 (per 1,000 population)*

	Males			Females		
Age group (years)	Aboriginals[(a)]	Total Australia	Rate ratio	Aboriginals[(a)]	Total Australia	Rate ratio
0	26.8	8.5	3.2	24.9	6.6	3.8
1–4	1.6	0.4	4.0	1.3	0.3	4.3
5–14	0.5	0.2	2.5	0.5	0.1	5.0
15–24	4.0	1.1	3.6	1.6	0.4	4.0
25–34	6.7	1.3	5.2	3.7	0.5	7.4
35–44	11.2	1.8	6.2	5.8	0.9	6.4
45–54	22.3	4.0	5.6	14.8	2.4	6.2
55–64	36.0	12.3	2.9	35.3	6.5	5.4
65–74	61.9	31.5	2.0	64.0	17.1	3.7
75 and over	138.4	95.3	1.5	103.6	71.9	1.4

(a) Rates for the Aboriginal population are based on data from Western Australia, South Australia and Northern Territory.

Sources: AIHW unpublished data; ABS 1992

The pattern of age- and sex-specific mortality in Aboriginals differs from the pattern in the population as a whole. The ratio of Aboriginal to total population rates is highest for females aged 25 to 34 years. At 55 to 74 years, the mortality for Aboriginal females is close to that for Aboriginal males whereas in the total population at these ages, female mortality is close to half the male mortality.

Significant regional variation in Aboriginal mortality also exists. Age-standardised mortality for female Aboriginals in the Northern Territory is higher than in Western Australia and South Australia. Aboriginal males from the Northern Territory also have the highest mortality.

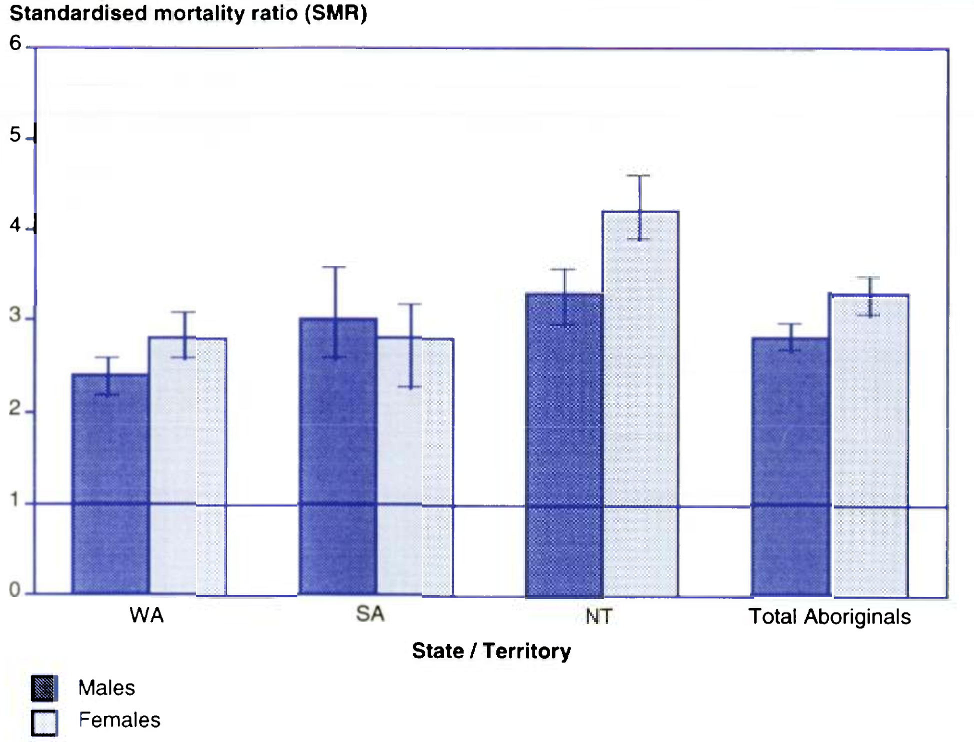
Expectation of life

Improvements in Aboriginal life expectancy over the past two decades have been achieved mainly through reduction in infant mortality. However, the expectation of life at birth, a useful indicator of mortality, remains much lower for Aboriginals than for the total Australian population. In 1990–92, the average life expectancy of a newborn Aboriginal boy was, depending on where he lived, up to 18.2 years shorter than his non-Aboriginal counterpart; the gap was up to 19.8 years for an Aboriginal girl (Figure 1.13, page 30). The proportion of newborn boys who could expect to live to age 65 was 45% for Aboriginals but 81% for non-Aboriginals. A larger proportion (54%) of Aboriginal girls could expect to live to 65, compared with 89% of non-Aboriginal girls.

Higher mortality at all ages implies lower life expectancy in adult life too. Expectation of life at adult ages is also much lower in Aboriginals than in non-Aboriginals.

Perinatal mortality

The other useful indicator of Aboriginal foetal and infant survival, the perinatal mortality, has also decreased over the last two decades, although it, too, varies greatly with location (Table 1.6, page 30).



Note: The vertical lines indicate the 95% confidence intervals. Standardised mortality ratios were estimated using age-specific death rates for the total Australian population during the corresponding period (1990 to 1992).

Source: AIHW unpublished data

Figure 1.12: ***Ratio of Aboriginal age-standardised mortality to total Australian population, selected States, 1990 to 1992***

Infant mortality

Aboriginal infant mortality has declined greatly since 1973 (Table 1.7, page 31). Improvements in this indicator can be attributed partly to the provision of better health care. However, Aboriginal infant mortality rates remain unacceptably high and, depending on location, can be more than three times the rate for all Australians.

Sources: AIHW unpublished data; ABS 1992

Figure 1.13: *Expectation of life at birth, Aboriginals in WA, SA and NT, and total Australian population, by sex, 1990 to 1992*

Table 1.6: *Perinatal mortality rates per 1,000 total births, Aboriginal and total Australian populations, 1973 to 1991*

	Aboriginals				
Period	**Qld[a]**	**WA**	**SA**	**NT**	**Total Australia**
1973 to 1975	62.6	–	–	53.1	22.3
1976 to 1978	50.8	–	–	60.7	18.2
1979 to 1981	26.8	29.9	–	49.0	14.5
1982 to 1984	29.8	25.6	–	39.3	12.8
1985 to 1987	28.3	19.8	39.8	43.6	11.7
1988 to 1990	26.9	17.6	38.8	44.4	10.8
1991	na	15.6	34.3	32.1	9.6

(a) The figures relate to Aboriginals living in the Queensland communities (Hogg & Thomson 1992).

Sources: Northern Territory Department of Health and Community Services 1992; Gee 1992; South Australian Health Commission 1993

Table 1.7: *Infant mortality rates per 1,000 live births, Aboriginal and total Australian populations, 1973 to 1991*

	Aboriginals				
Period	**Qld[a]**	**WA**	**SA**	**NT**	**Total Australia**
1973 to 1975	78.8	–	–	61.7	15.7
1976 to 1978	56.1	–	–	58.4	12.8
1979 to 1981	27.4	24.7	–	36.8	10.7
1982 to 1984	28.6	24.8	–	32.9	9.7
1985 to 1987	19.3	21.6	20.9	34.9	9.1
1988 to 1990	15.6	22.3	23.2	31.2	8.3
1991	na	[b]19.2	24.9	26.9	7.1

(a) The figures relate to Aboriginals living in the Queensland communities (Hogg & Thomson 1992).
(b) Estimate provided by the Department of Health, Western Australia.

Sources: Northern Territory Department of Health and Community Services 1992; Gee 1992; South Australian Health Commission 1993

Maternal deaths

The number of maternal deaths in Australia has decreased by almost two thirds since 1970–72 (Table 1.8). However, no concomitant reduction in the number of Aboriginal maternal deaths has been noted. Aboriginals are 1.6% of women aged 15 to 44 years, and the birth rate in Aboriginal women is 46% higher than in non-Aboriginal women. Nonetheless, 11 of the 37 direct maternal deaths (those resulting from obstetric complications) in 1988–90 and 5 of 12 maternal deaths where an avoidable factor was judged to have been present were of mothers known to be Aboriginal.

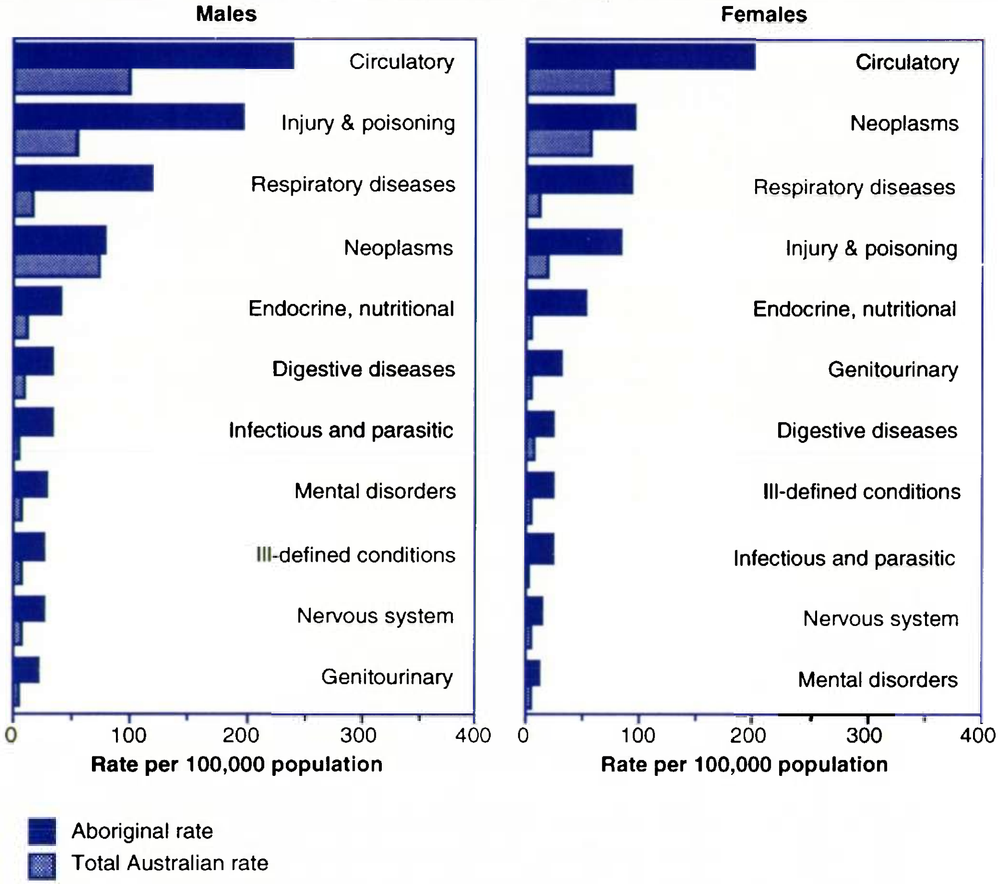
Table 1.8: *Maternal deaths by triennium, Aboriginals and non-Aboriginals, 1970 to 1990*

	Aboriginals		Non-Aboriginals	
Triennium	**Direct deaths**	**Total deaths**	**Direct deaths**	**Total deaths**
1970 to 1972	13	18	137	226
1973 to 1975	5	6	55	131
1976 to 1978	5	9	47	97
1979 to 1981	6	15	48	83
1982 to 1984	5	8	37	86
1985 to 1987	4	13	28	75
1988 to 1990	11	14	26	82

Source: NHMRC 1993

Causes of death

The causes of Aboriginal mortality have not changed greatly over the past five years. Diseases of the circulatory system, particularly ischaemic heart disease and cerebrovascular disease, and injury and poisoning continue to account for most deaths (Figure 1.14).



Note: Figures for Aboriginal population are based on data from Western Australia, South Australia and the Northern Territory.

Source: AIHW unpublished data

Figure 1.14: ***Aboriginal and total Australian death rates, by cause and sex, 1990 to 1992***

In Aboriginal males, the death rate from diseases of the respiratory system was 7.3 times that of all Australian males; among Aboriginal females it was 7.9 times that of all Australian females. Respiratory infections due to overcrowding, and high rates of smoking, have contributed to these deaths.

The other major contributor to excess mortality among Aboriginals was diabetes, which accounts for almost all the differences between Aboriginal and total Australian mortality from endocrine and nutritional diseases, as shown in Figure 1.14.

Infectious and parasitic diseases also cause disproportionate mortality among Aboriginals. Aboriginal mortality from these preventable causes was 12.2 times (males) and 13.4 times (females) that in Australia as a whole in 1990–92. Genitourinary disorders constituted another group of diseases causing relatively high mortality among the Aboriginals.

Morbidity

Although a number of States and Territories have the capacity to identify Aboriginals in their statistical collections, provision for identification does not necessarily guarantee its reliable use (see Section 5.4, page 216). Availability of morbidity data for Aboriginals is also limited.

In this analysis, hospital separation data from New South Wales and South Australia have been pooled to yield a profile of Aboriginal morbidity (Table 1.9). There are substantial differences in the levels of morbidity between the two States, but in both States the standardised hospital admission rates for Aboriginals are much higher than those for the non-Aboriginal population.

Table 1.9: *Age-specific hospital admission rates by sex, Aboriginals and non-Aboriginals,*[(a)] *1991–92 (per 1,000 persons)*

	Males			Females		
Age group (years)	**Aboriginals**	**Non-Aboriginals**	**Rate ratio**	**Aboriginals**	**Non-Aboriginals**	**Rate ratio**
0–4	514	353	1.5	413	245	1.7
5–14	99	102	1.0	93	78	1.2
15–24	165	118	1.4	362	223	1.6
25–34	290	133	2.2	388	346	1.1
35–44	370	153	2.4	365	238	1.5
45–54	470	223	2.1	408	259	1.6
55–64	645	352	1.8	674	315	2.1
65–74	714	532	1.3	895	423	2.1
75 and over	1,139	741	1.5	861	600	1.4
All ages	**371**	**218**	**(b)1.7**	**428**	**272**	**(b)1.6**

(a) Rates for both Aboriginal and non-Aboriginal populations represent combined data for NSW and SA.

(b) Age-standardised rate ratios.

Source: AIHW unpublished data

Hospital admission rates

For Aboriginal males, the standardised hospital admission rate of 371 per 1,000 population was 71% higher than for non-Aboriginal males. The admission rate for Aboriginal females, which includes admissions for childbirth, was 354 per 1,000, 57% higher than for non-Aboriginal females.

The hospitalisation rates for Aboriginals were higher in all age groups than for non-Aboriginals. The relative rates were particularly high among males aged 25 to 54; Aboriginal women were relatively higher users of hospital services in later years.

Disability

Disability leads to a significant loss of healthy life. In 1988, 16% of the Australian population, a large proportion of whom were also handicapped, were disabled (see Box 1.3, page 11, for definitions). Both sexes shared the burden of disability, although the proportion of severely handicapped females significantly exceeded that of males (ABS 1990).

The ABS sampling for the 1988 Survey of Disability and Handicap did not enable it to provide separate data on disability among Aboriginals. However, a survey in an Aboriginal community in the Taree area in New South Wales, conducted under the auspices of the Institute and using the survey methods and definitions recommended by the ABS, has quantified the extent of disability and handicap in one group of Aboriginals. One in four people reported a disabling condition (Table 1.10), the most common of which involved loss of sight or hearing. Other leading reported causes of disability included diseases of the musculoskeletal system and connective tissues. Most frequent specific disabilities were asthma (5.0%), slow learning and specific delays in development (4.1%), and heart disease (4.0%). Slow learning and specific delays in development often caused educational handicap (Thomson & Snow 1993).

Although these results from a local survey may not be representative, in comparison to the total Australian population, the Aboriginals were 70% more likely, after adjusting for differences in the age distributions, to be handicapped (Table 1.10). The relative importance of the areas of handicap was also different, although a mobility handicap was the most frequently reported handicap in both populations. More Aboriginals reported handicap in the areas of employment and education than did people in the total Australian population.

Chronic otitis media (middle ear infection) and the associated hearing loss affect a significant proportion of Aboriginal adults and children. Otitis media develops during infancy and contributes heavily to ear perforations and effusions (Boswell et al. 1993). As much as 41% of the children in one remote Aboriginal community have been shown to suffer from the disease (Menzies School of Health Research 1993). The hearing loss has a strong impact on Aboriginal schoolchildren's classroom attendance, behaviour and learning. These in turn contribute to a variety of social and health problems.

Table 1.10: *Disability and handicap, Aboriginals of the Taree area of New South Wales*

	Number disabled (per 1,000 persons)				Age-adjusted rate ratio with 95% confidence interval	
	Aboriginals		Total Australia			
Condition	Males	Females	Males	Females	Males	Females
Disabled	249	251	160	152	2.5 (2.1–3.0)	2.9 (2.4–3.5)
Handicapped	139	148	130	130	1.7 (1.4–2.1)	1.8 (1.5–2.3)
Severely handicapped	49	53	32	49	2.4 (1.5–3.6)	2.3 (1.5–3.4)

Sources: Thomson & Snow 1993; ABS 1990

Risk factors in Aboriginals

It is difficult to estimate accurately the prevalence of risk factors in Aboriginals, who are usually under-represented in large population studies such as the Risk Factor Prevalence Study (RFPS). However, several recent studies have examined risk factors in Aboriginals living in regions of Western Australia and New South Wales.

Smith et al. (1992a) studied the prevalence of hypertension and its relationship to coronary heart disease among Kimberley Aboriginals and found the prevalence of hypertension to be substantially higher than in non-Aboriginal Australians (Table 1.11).

Table 1.11: *Age-specific prevalence of hypertension in male and female Aboriginals 1988–89, and expected prevalence from 1983 RFPS (per 1,000 population)*

	Males			Females		
Hypertension / Age group (years)	**Sample size**	**Aboriginals**	**1983 RFPS**	**Sample size**	**Aboriginals**	**1983 RFPS**
Systolic (≥ 160 mmHg)						
15–24	43	20	na	39	–	na
25–34	45	90	10	44	–	–
35–44	40	75	36	31	65	19
45–54	30	130	109	36	250	80
55–64	38	340	239	42	525	182
65 and over	40	375	na	30	365	na
Diastolic (≥ 95 mmHg)						
15–24	43	45	na	39	–	na
25–34	45	200	43	44	25	10
35–44	40	200	92	31	195	44
45–54	30	235	158	36	220	93
55–64	38	340	193	42	380	117
65 and over	40	275	na	30	200	na

Source: Derived from Smith et al. 1992a

Both alcohol consumption and overweight were associated with hypertension among Kimberley Aboriginals, and there was a relationship between high blood pressure and high plasma cholesterol level (Smith et al. 1992b).

Another survey of 516 Aboriginal men and women in the Kimberley region found that although non-drinkers were more common among Aboriginal men and women in the Kimberley region than in the general Australian community the proportion who drank at harmful levels was much higher among Kimberley Aboriginals. Of the men, 76% were found to be drinkers, and 46% of the women (Hunter, Hall & Spargo 1992). The proportion consuming harmful quantities of alcohol (see Box 1.12, page 64) was 66% for men and 38% for women (Table 1.12).

Four of twenty-one New South Wales projects that measured cardiovascular disease risk factors included data from Aboriginal populations. A summary of these (Boyle & Dobson 1992) reported that the Wilcannia Aboriginal population had a high proportion of male and female smokers, of women with high blood cholesterol (≥ 6.5 mmol/L), of men and women with high diastolic blood pressure (≥ 90 mmHg), and of women who were overweight or obese compared with non-Aboriginal groups. Mean body mass index (see Box 1.10, page 60) was high for both the Wilcannia Aboriginal population and for the North Coast Aboriginal and Islander population compared with other groups, and the prevalence of diabetes among the Bourke and the Enngonia Aboriginal populations was also very high compared with other groups.

Table 1.12: *Population estimates of the prevalence of drinking patterns among Aborigines in the Kimberley*[a] *(per cent)*

Drinking pattern	Males	Females	Persons
Abstainers	8 (4–11)	37 (31–43)	22 (18–26)
Ex-drinkers	16 (12–21)	17 (13–22)	17 (14–20)
Drinkers	76 (71–82)	46 (40–52)	61 (57–65)
Episodic drinkers	26 (21–31)	20 (15–25)	23 (20–27)
Intermittent drinkers	29 (24–35)	16 (12–21)	23 (20–26)
Constant drinkers	21 (16–26)	9 (6–13)	15 (12–18)
Drinkers at harmful levels[b]	66 (60–72)	38 (32–44)	52 (48–56)

(a) 95% confidence intervals shown in parentheses.

(b) Persons drinking more than the NHMRC harmful level.

Source: Hunter, Hall & Spargo 1992

1.3.4 Residents of rural Australia

About 36% of Australians live outside capital cities, half in major regional centres and the remainder in rural and remote areas. Non-city dwellers experience wide variation in health and in their access to and use of health services. Although there is little apparent difference in health and service use between residents of major regional centres and of capital cities, this is in marked contrast with that of many rural Aboriginal communities whose poorer health (see Section 1.3.3) is compounded by lack of access to services.

Until recently there have been relatively few studies of rural health and the knowledge is still incomplete. This is partly because there have not been standard definitions of what constitute 'rural', 'remote', and 'non-metropolitan' areas. There is considerable demographic, socioeconomic and geographic heterogeneity in non-metropolitan Australia, and the choice of definition has a significant bearing on the pattern of health status that emerges.

The geographical information collected in the 1989–90 National Health Survey allows only broad differentiation of capital city residents from other residents. For this reason, the analyses below, for ages 25 to 64, compare metropolitan and non-metropolitan residents only. Such comparisons of very broadly defined areas mask important regional differences, and differences between urban, rural and remote dwellers. They provide only a very general picture of average differences between metropolitan and non-metropolitan Australians. It is not intended to imply that this one measure of metropolitan/non-metropolitan health differential adequately reflects differentials for all rural areas.

Among Australian men and women aged 25 to 64 years, non-metropolitan residents experience higher mortality than metropolitan residents: 15% higher for men and 9% higher for women during 1985–87 (Table 1.13, page 39). The differentials for avoidable deaths (see Box 1.5) are even larger (47% for men and 30% for women). Non-metropolitan residents have higher death rates for all major causes of death except cancers and mental disorders. Some of the strongest differentials for selected causes of death are:

- pneumonia/influenza—56% higher for men and 94% higher for women
- traffic accidents—59% higher for men and 52% higher for women
- diabetes—46% higher for women (but not higher for men)
- cerebrovascular disease—24% higher for men and 27% higher for women
- ischaemic heart disease—11% higher for men and 17% higher for women.

In contrast, non-metropolitan women have lower death rates from breast cancer and suicide.

No clear pattern in reported morbidity is evident. Analyses of the first Australian Health Survey 1978–79 show that rural residents reported more recent and chronic illness and higher rates of smoking and drinking (Humphreys 1990), whereas the second survey in 1983 found fewer reported illnesses in rural residents (Clarke 1990).

The 1988 ABS Survey of Disabled and Aged Persons found that men living in non-metropolitan areas experienced higher levels of handicap, disability and reduced activity, unlike women, for whom there were only very minor geographical differences (Table 1.13). These men were also more likely to report fair to poor health in the 1989–90 National Health Survey.

Box 1.5: Avoidable deaths

Avoidable deaths are deaths from conditions which should be wholly or substantially manageable with adequate medical care, at least in people under 65 years of age. A US working group (Rutstein et al. 1976, 1980) developed a list of diseases for which there is evidence that medical treatment can prevent death after the disease has been contracted. This approach has been widely used to develop indicators of health service outcomes to assess the adequacy and effectiveness of health care delivery (Holland 1988, Desmeules & Semenciw 1991). For ages 25 to 64, avoidable deaths are defined as deaths due to the following causes:

- *tuberculosis*
- *cervical cancer*
- *Hodgkin's disease*
- *deficiency anaemias*
- *rheumatic heart disease*
- *hypertensive heart disease*
- *acute respiratory disease*
- *pneumonia, bronchitis and influenza*
- *appendicitis*
- *hernia*
- *cholecystitis.*

Potential years of life lost are years of life not lived between age at death and age 65, where the person dies an avoidable death. Avoidable death rates and potential years of life lost are age-adjusted using the 30 June 1988 Australian population as the reference population.

Box 1.6: National Health Survey definitions

Fair/poor health: *An answer of 'Fair' or 'Poor' when asked for self-assessed health status on a scale of Excellent, Good, Fair, Poor.*

Unhappiness: *An answer of 'Unhappy' or 'Very unhappy' when respondents asked how they felt generally on a scale of Very happy, Happy, Unhappy, Very unhappy.*

Overweight and obesity: *A body mass index of greater than 25.0 kg/m^2 (see Box 1.10, page 60).*

Inactivity: *Undertaking no physical exercise for recreation, sport or health/fitness reasons. Calculated using data from the National Health Survey on the amount of time spent in the last two weeks in walking, moderate exercise and vigorous exercise for recreation, sport or fitness reasons.*

Smoking: *Current smokers.*

Alcohol risk: *Medium or high relative health risk due to alcohol consumption (see Box 1.12, page 64).*

Hospital episodes: *Number of inpatient episodes during last twelve months where both admission and discharge took place within the twelve-month period.*

Doctor visits: *Number of doctor consultations per annum (including telephone calls and proxy visits). Doctor consultations during hospital inpatient episodes or visits to hospital outpatient/casualty clinics not included. 'Doctor' includes general practitioners and specialists. Estimated by multiplying by 26 the average number of doctor visits in the two weeks prior to interview.*

Dental visits: *Number of dental consultations per annum. Dental consultations include consultations with all dental professionals (e.g. dentists, orthodontists, dental nurses and dental technicians) about teeth, dentures or gums. Estimated by multiplying by 26 the average number of dental consultations in the two weeks prior to interview.*

Other health professional visits: *Number of consultations per annum with the following health professionals: chemist (for advice), optician/optometrist, physiotherapist, psychologist, social worker/welfare officer, chiropodist/podiatrist, nurse (school, baby health, other excluding dental nurse), dietitian, chiropractor, osteopath, naturopath, herbalist, acupuncturist. Includes only consultations at which some discussion and/or treatment of a health-related or medical condition took place or was arranged. Estimated by multiplying by 26 the average number of consultations with the health professionals listed above in the two weeks prior to interview.*

Mammography screening rate: *Percentage of women aged 40 to 64 years who have had a mammogram in the last three years.*

Pap smear screening rate: *Percentage of women aged 25 to 64 years who have had a Pap smear test in the last three years.*

Rubella immunisation rate: *Percentage of women aged 25 to 44 years who have been immunised against rubella.*

Table 1.13: *Health indicators, age-standardised rates*[(a)] *and rate ratios by region and sex, age 25 to 64 years, late 1980s*

	Men			Women		
Health indicator	**Metro ASR**	**Non-metro ASR**	**Rate ratio**	**Metro ASR**	**Non-metro ASR**	**Rate ratio**
Health status indicators						
Mortality	424.18	488.48	1.15 ***	226.39	247.30	1.09 ***
Avoidable deaths	7.88	11.55	1.47 ***	10.01	12.96	1.30 ***
Potential years of life lost	51.06	62.23	1.22 ***	27.12	30.96	1.14 ***
Fair / poor health	17.06	18.59	1.09	18.40	17.83	0.97
Severe handicap	2.45	3.05	1.25 *	3.33	3.05	0.92
Handicap	12.33	14.98	1.21 ***	11.75	11.41	0.97
Disability	15.14	18.45	1.22 ***	13.80	13.38	0.97
Chronic illness	1.13	1.12	0.99	1.31	1.21	0.92 ***
Unhappiness	5.02	3.60	0.72 ***	5.24	2.31	0.44 ***
Risk factors						
Overweight and obesity	48.14	49.55	1.03	31.95	34.38	1.08 *
Inactivity	35.69	40.85	1.14 ***	36.03	35.63	0.99
Smoking	33.49	34.27	1.02	24.71	27.30	1.10 **
Alcohol risk	14.24	18.20	1.28 ***	8.01	6.84	0.85 *
Height	1.76	1.77	1.00	1.62	1.63	1.00

(a) Age-standardised to 1988 Australian population.

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

Source: Mathers 1994

The only chronic illnesses reported more frequently by non-metropolitan residents were:

- arthritis—19% more often for men
- deafness—29% more often for men.

Non-metropolitan residents reported the following illnesses less often:

- hay fever—28% less often for men
- migraine—19% less often for women
- headache—14% less often for men and 11% for women
- nerves, tension or emotional problems—28% less often for men and 23% less often for women
- insomnia—30% less often for men
- high cholesterol—31% less often for men and 27% less often for women (these differences may in part reflect differential access to diagnostic services).

Both men and women living in non-metropolitan areas were less likely to report that they are unhappy (28% less for men and 56% less for women).

In non-metropolitan areas men tended to be more inactive (14% higher) and intermediate to high risk drinkers (see Box 1.11) (28% higher), whereas women were less likely to be medium to high risk drinkers (15% lower), but more likely to be overweight and obese (see Box 1.10) (8% higher) and smokers (10% higher).

Nutrition in rural residents is discussed in Section 1.4.1.

A focus of attention over recent years has been on the unequal distribution of health services between urban and rural areas, in particular the recruitment and retention of doctors in small country towns (National Rural Health Conference Organising Committee 1991). The differences in health service use shown in Table 1.14 are consistent with more detailed analyses of health service provision by Mathers & Harvey (1988), and Reid & Solomon (1992).

Table 1.14: ***Health service use, age-standardised rates[(a)] and rate ratios by region and sex, age 25 to 64 years, late 1980s***

	Men			Women		
Health service	**Metro ASR**	**Non-metro ASR**	**Rate ratio**	**Metro ASR**	**Non-metro ASR**	**Rate ratio**
Hospital episodes	0.13	0.16	1.25	0.22	0.27	1.21
Doctor visits	5.45	4.80	0.88 ***	8.72	6.74	0.77 ***
Dental visits	1.59	1.15	0.72 ***	2.07	1.56	0.75 ***
Other health professional visits	3.76	3.23	0.86	4.97	4.39	0.88
Mammography screening rate (40+ years)	**na**	**na**		23.60	20.79	0.88 *
Pap smear screening rate	**na**	**na**		73.64	78.52	1.07 **
Rubella immunisation rate (25–44 years)	na	na		73.09	74.90	1.02

(a) Age-standardised to 1988 Australian population.

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

Source: Mathers 1994

Residents of non-metropolitan areas reported over 20% more hospital admissions and more outpatient visits but fewer doctor and dentist visits than their metropolitan counterparts (Table 1.14). Britt et al. (1993) compared country and metropolitan general practice. They found that country practitioners were more than twice as likely to admit their patients to hospital than metropolitan practitioners, as measured by admissions per 100 encounters, suggesting that this reflects greater involvement of country general practitioners with the hospital care of their patients. Although the mammography screening rate was lower for non-metropolitan women, their Pap smear screening rate was 7% higher, but lower in small country towns.

In recent years there has been increasing recognition that rural Australians suffer poorer health than city dwellers and, additionally, have significant problems of access to health services (Reid & Solomon 1992, Davenport, Mant & Flishie 1989, Humphreys & Rolley 1993). This recognition has resulted in some important national initiatives including the 1991 Toowoomba National Rural Health Conference, which produced a national rural health strategy; the National Health Strategy Report, *Improving Australia's rural health* *and aged care services*; and the funding by the Australian Health Ministers' Advisory Council of a National Rural Health Unit. The Rural Incentives Program and the establishment of Divisions of General Practice are major Commonwealth budget initiatives designed to influence the recruitment, retention and training of rural doctors. At the State level, the recently established Rural Training Units are working towards the same end. The Commonwealth Government's North Australia Social Justice Strategy and the Rural Health Support Education and Training Programs have also been set up to address the problems relating to getting services to rural areas and the considerable inequity that characterises rural and remote areas. The activities of the recently established National Rural Health Unit are likely to enhance this momentum and should help to provide a better picture of the health status and service needs of rural and remote communities.

1.3.5 Employed people

As part of its responsibility for national monitoring of work-related injuries and diseases, the National Occupational Health and Safety Commission (Worksafe Australia) has developed a National Data Set for compensation-based statistics (NDS). The NDS, originally agreed to in 1987, recommends a standard set of data items, concepts, and definitions (see Box 1.7) for inclusion in workers' compensation collections. Its main purpose is to enable the production of national and nationally comparable workers' compensation data.

The NDS is being implemented progressively across Australia. By early 1994, only seven jurisdictions (New South Wales, Western Australia, South Australia, Tasmania, the Northern Territory, and Comcare and Australia Post) had supplied data in the NDS format to Worksafe Australia.

Box 1.7: Definitions of selected terms used in the National Data Set for compensation-based statistics

Industry: *the predominant industry at the location at which the occupational injury occurred, classified in accordance with the Australian standard industrial classification, 1983 edition, ABS Catalogue No. 1201.0.*

Occupation of the injured worker: *classified in accordance with the Australian standard classification of occupations, 1986 edition, ABS Catalogue No. 1222.0.*

Duration of absence: *classified for absences of five working days or more and shown in complete working weeks. Thus an absence of twelve working days is shown as of two working weeks.*

Data from the Australian Bureau of Statistics (ABS) Labour force survey, *Catalogue No. 6203.0, and* Survey of employee earnings and hours, *Catalogue No. 6306.0, were used in calculation of incidence rates.*

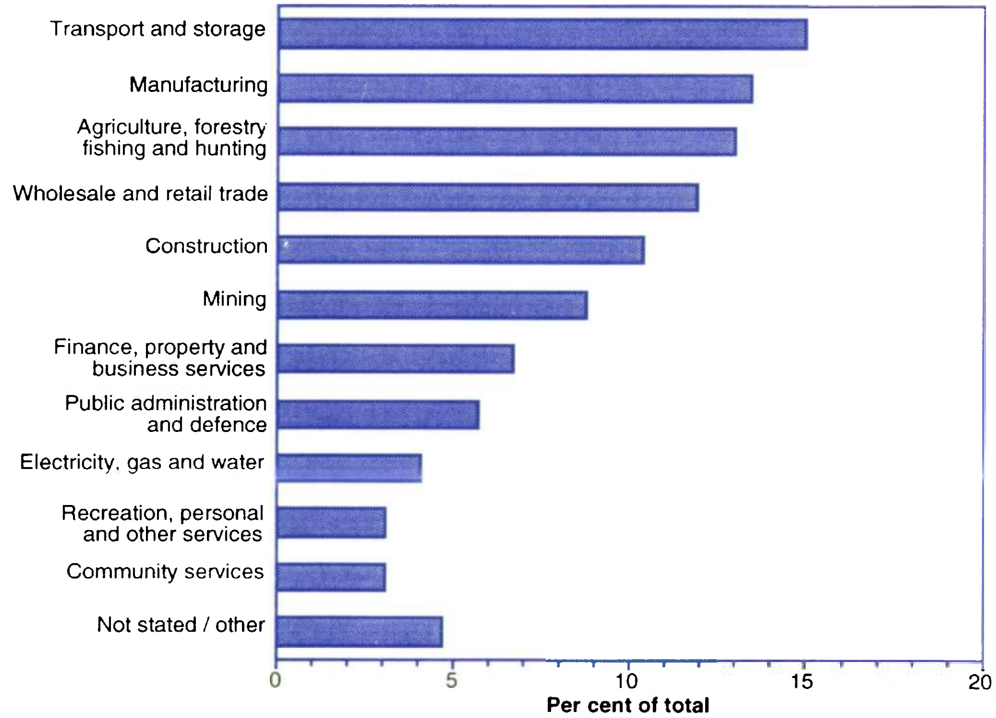
Estimates of the cost of workers' compensation claims were derived from the ABS Australian national accounts *(unpublished).*

The data are derived from workers' compensation claims received by workers' compensation agencies from insurance companies, self-insurers, and some government departments. The claims were for workers' compensation relating to a fatality, a permanent disability, or a temporary disability resulting in an absence from work of one week (five working days) or more.

Workers' compensation data

In the seven jurisdictions for which data were available, a total of 193 occupational fatalities were reported to workers' compensation authorities for 1991–92; 180 (93%) deaths were of males and 13 (7%) of females. The fatality rate for these jurisdictions was 50 per 1,000,000 wage and salary earners. The industry and occupation distributions of the deaths are shown in Figures 1.15 and 1.16.

New workers' compensation cases reported for 1991–92 for the seven jurisdictions totalled 90,571, 76.3% being for males and 23.7% for females. Figure 1.17 (page 44) shows the incidence of new workers' compensation cases by sex in industry divisions. The predominance of males in workers' compensation cases in some industries reflects the different occupation distributions of men and women in these industries.

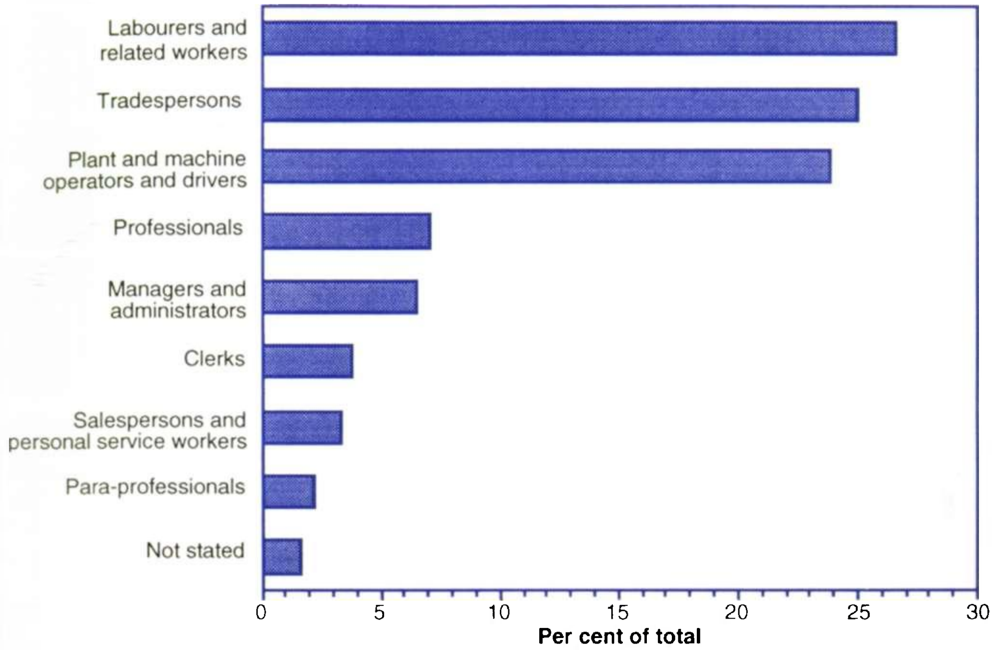


Note: Excludes Vic, Qld, ACT and Telecom. Total fatalities = 193.

Source: Worksafe Australia

Figure 1.15: ***Reported occupational fatalities by industry, 1991–92***

Occupation data were available for 83,114 new workers' compensation cases, 77.5% male and 22.5% female. Figure 1.18 (page 45) shows the incidence of new workers' compensation cases reported for major occupation groups.



Note: Excludes Vic, Qld, ACT, Comcare, Telecom and Australia Post. Total fatalities = 184.

Source: Worksafe Australia

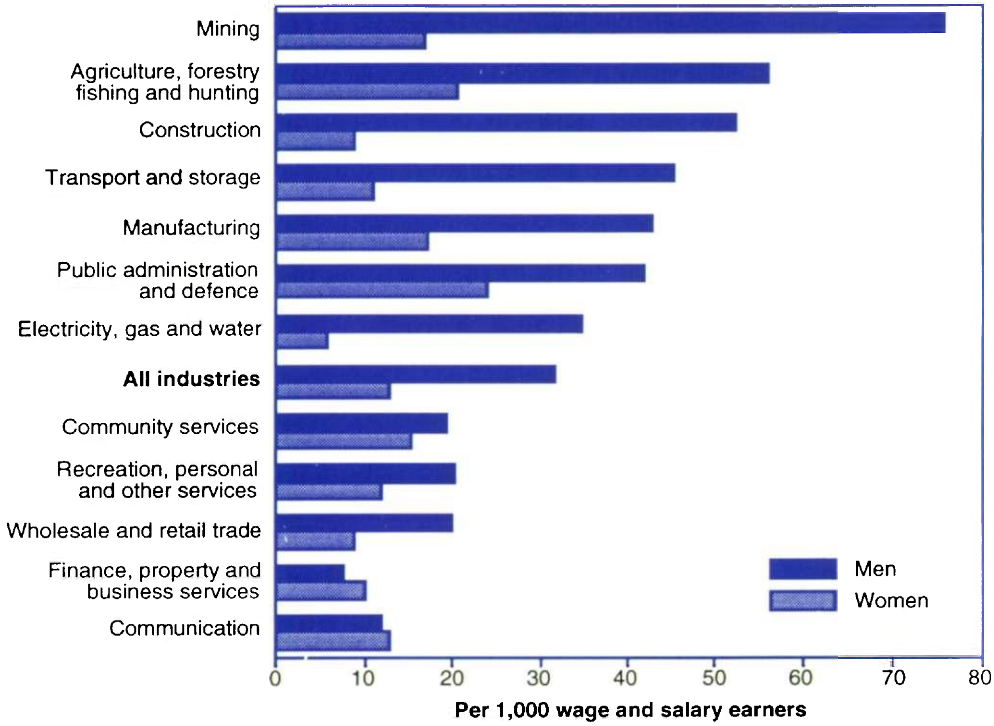
Figure 1.16: *Reported occupational fatalities by occupation, 1991–92*

For the total of 90,571 new workers' compensation cases, working time lost totalled 624,368 weeks, with an average time lost of 7.7 weeks per occurrence. For men, the average time lost was 7.2 weeks, and for women it was 9.2 weeks.

The highest number of cases (31.8% of all cases) lost one complete working week. This proportion decreased rapidly for longer absences. Two complete working weeks were lost in 13.9% of cases, and 8.0% of cases lost three complete working weeks. Absences of four complete working weeks or longer made up the remainder.

Costs of workers' compensation

The estimated direct cost of workers' compensation claims for all of Australia was $4,830 million for 1992–93. This represented 1.2% of non-farm gross domestic product, and 2.4% of non-farm wages, salaries and supplements in 1992–93. Figure 1.19 (page 45) shows constant price estimates of the cost of workers' compensation claims for the period from 1977–78 to 1992–93, as derived from the Australian Bureau of Statistics Australian National Accounts. It shows the cost of claims increasing until 1986–87, but not changing greatly since 1987–88.

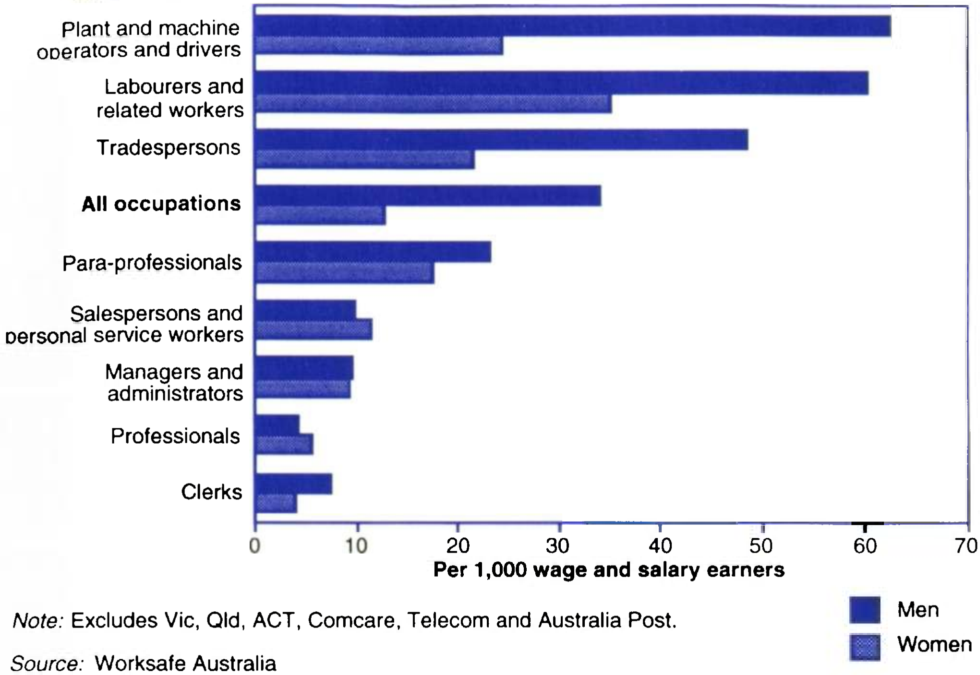


Note: Excludes Vic, Qld, ACT and Telecom.

Source: Worksafe Australia

Figure 1.17: ***Incidence of new workers' compensation cases, by industry, 1991–92***

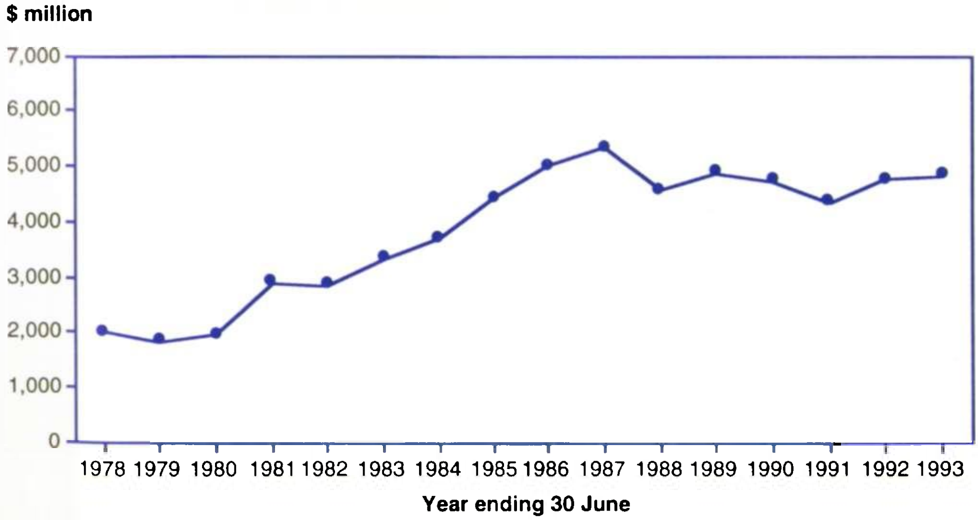
As well as direct costs, workers' compensation has significant indirect economic and social costs. In Australia, a conservative ratio of 1:1 for indirect costs to direct costs has been used in recent years to calculate the total costs of occupational injury and disease to the community. The ratio of indirect costs to direct costs within a number of industries in industrialised countries has been of the order of 1:1 to 1:7, but the ratio may be higher or lower and may vary over time. Using the 1:1 ratio, the total cost to the Australian community of occupational injuries and diseases is estimated at $9,700 million for 1992–93.



Note: Excludes Vic, Qld, ACT, Comcare, Telecom and Australia Post.

Source: Worksafe Australia

Figure 1.18: *Incidence of new workers' compensation cases, by occupation , 1991–92*



Source: Worksafe Australia

Figure 1.19: *Total workers' compensation claims (constant prices 1992–93 dollars), 1977–78 to 1992–93*

1.4 Factors which influence health

1.4.1 Nutritional status

Relationship between nutrition and health

Nutrition is an important contributor to health, and the evidence linking diet with the chronic, preventable, non-communicable diseases is sufficiently strong for public health initiatives to include improved nutrition as a major component. These diseases and their risk factors arise from overconsumption. Although there are less than optimum intakes of some nutrients in some groups, undernutrition is uncommon in Australia.

A national policy on food and nutrition, with the equitable improvement of nutritional status for Australians as its goal, came into existence in September 1992 (Commonwealth Department of Health, Housing and Community Services 1992).

The Institute has recently published *Australia's food & nutrition* (Lester 1994). This report gives more detail and fuller references to sources than are presented here.

Food consumption

Table 1.15 (page 48) shows changes in the composition of the available food supply between 1985–86 and 1990–91. The most notable changes were increases in seafood and non-alcoholic beverage consumption, and decreases in egg and alcoholic beverage consumption.

Box 1.8: Dietary guidelines for Australians

Dietary guidelines are the basis for public health nutrition action. First announced in 1981, they were revised in 1992 in recognition of the different requirements of some groups. The revised guidelines (NHMRC 1992a) are:

1. *Enjoy a wide variety of nutritious foods.*
2. *Eat plenty of breads and cereals (preferably wholegrain), vegetables (including legumes) and fruits.*
3. *Eat a diet low in fat and, in particular, low in saturated fat.*
4. *Maintain a healthy body weight by balancing physical activity and food intake.*
5. *If you drink alcohol, limit your intake.*
6. *Eat only a moderate amount of sugars and foods containing added sugars.*
7. *Choose low salt foods and use salt sparingly.*
8. *Encourage and support breastfeeding.*

Guidelines on specific nutrients

1. *Eat foods containing calcium. This is particularly important for girls and women.*
2. *Eat foods containing iron. This applies particularly to girls, women, vegetarians and athletes.*

Preliminary data for 1991–92 show a record low 217g per person per day meat consumption, with an 8.6% decrease in beef and veal consumption between 1990–91 (111g per person per day) and 1991–92 (102g); there were also decreases in consumption of sheep meat and offal, and a continuation of the long-term upward trend in pig meat and poultry consumption.

Changes in the food supply can affect habits and food intakes. Important food supply changes over the last few years have been the introduction of fat-modified milks and other dairy products, and changes in the way in which meat products are marketed have also occurred.

Over the last decade the variety of liquid milk products has expanded to include a range of fat contents from skim milk (0.1% fat) to whole milk (4.8%), a range of flavoured products, and products with increased calcium content. Recently, lactose-modified milks, and a modified milk in which milk fat is replaced by canola oil have also entered the market. The most important changes in the meat supply have been the increased availability of lean beef and the introduction of 'trim lamb'.

Consistent with known physical and physiological differences between the sexes, all dietary survey data since 1983 demonstrate higher mean total consumption in men than in women. However, this does not hold for all foods and food groups; for instance, women consume more fruit and non-alcoholic beverages (Commonwealth Department of Health 1986; CSIRO unpublished data). Men consume much greater quantities of alcoholic beverages.

Box 1.9: Definitions of some terms relating to nutrition

Micro-nutrients: *chemical elements and organic molecules that cannot be synthesised through human metabolism but which are essential for metabolic function. For example, zinc is a co-factor for many enzymes and is involved in most metabolic processes; iodine is required for thyroid hormones; folic acid is essential for nucleic acid synthesis, and hence cell growth.*

Macro-nutrients: *generally defined as those food components that supply energy, that is, carbohydrates, protein, fat, ethanol and some organic acids. Usually, however, dietary fibre (some forms of which do provide energy), water and cholesterol are included in this category.*

Recommended Dietary Intakes (RDIs): *'levels of intakes of essential nutrients considered...to be adequate to meet the known nutritional requirements of practically all healthy persons' (NHMRC 1991). Except for the RDIs for energy, RDIs are not applicable to individuals. They are a group or population measure, and may also be used to estimate the adequacy of the food supply.*

Nutrient density: *the ratio of the nutrient content or intake to the estimated energy content or intake. It is usually expressed as amount of nutrient per 1000 kJ.*

Table 1.15: *Apparent per capita consumption of selected foodstuffs, 1985–86 to 1990–91 (g per day, except where stated)*

	1985–86	1986–87	1987–88	1988–89	1989–90	1990–91
Grain products	232	232	242	241	246	253
Vegetables[a]	**373**	381	412	416	443	428
Fruit & fruit products[a]	**293**	292	289	311	308	302
Meat & meat products[b]	**233**	224	229	228	233	231
Poultry	**63.0**	64.4	67.7	67.7	67.4	69.6
Seafood	20.5	20.8	21.6	23.8	24.1	26.0
Eggs & egg products (number per year)	140	138	135	128	125	126
Nuts	**14.8**	15.6	14.8	15.6	16.7	15.9
Dairy products[c]	**62.5**	64.7	65.5	64.9	64.7	63.6
Market milk (fluid whole) (mL per day)	**281**	282	278	276	276	277
Oils & fats[d]	**57.3**	56.4	55.9	55.3	54.2	54.2
Sugars[e]	**137**	134	130	132	133	129
Beverages (mL per day)						
Aerated and carbonated waters	**218**	222	240	256	262	265
Alcoholic	376	362	360	362	356	346

(a) Fresh equivalent weight.

(b) Carcass equivalent weight. Cured carcass weight of bacon and ham is not included in the above total, and added 19.5 g per capita in 1990–91.

(c) Converted to milk solids, fat and non-fat. Includes market milk.

(d) Fat content. Includes an estimate for vegetable oils and other fats.

(e) Includes sugars content of syrups and glucose.

Source: ABS Cat. No. 4306.0

The 1989 CSIRO Survey of the Elderly found that 92% of men and 96% of women aged 55 years and over had tried to change their diets: most respondents felt that they had increased their fibre intake and reduced total amount of food, and fat, sugar, and salt intakes in the previous few years.

Data from the Longitudinal Study of Adolescents for 1992 show that 22% of 16-year-olds, 23% of 17–18-year-olds and 27% of 19–22-year-olds said that they were 'on a diet'; this included slimming diets, eating less fat, or more fruit and vegetables, or less 'junk food', or less chocolate or, simply, less food.

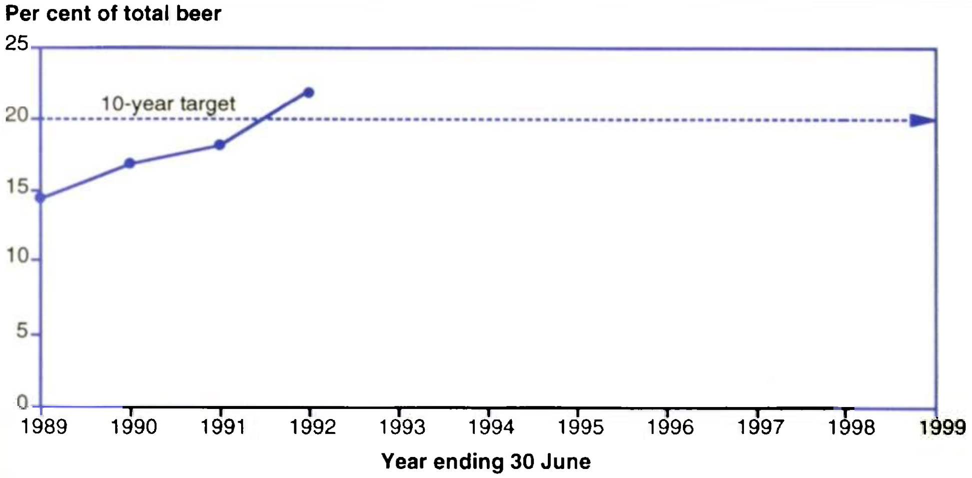
Food prepared outside the home has become an important contributor to total consumption. In a 1991–92 survey of consumers aged 18 years and over, 60% of male and 57% of female respondents had consumed 'fast foods' at least once in the previous four weeks, and 16% and 15% respectively had ordered home-delivered pizza (Table 1.16). The purchase of fast foods decreases with age (Table 1.16).

Table 1.16: *Fast-food buyers during previous four weeks, by age and sex, April 1991 to March 1992 (per cent)*

Sex / Age group	Purchasing in last four weeks	Home pizza delivery
Sex		
Men	**60**	16
Women	**57**	15
Age group		
18–24	**84**	28
25–44	**70**	21
45–64	**43**	8
65 and over	20	2

Source: Morgan 1992. Adapted by permission.

Revised National Health Goals and Targets were released in 1992 (see Section 1.5). Some of the targets related to food supply. There is little information as yet about progress towards them; the only monitoring tool that has provided trend data thus far is the Apparent Consumption of Foodstuffs and Nutrients series (ABS Cat. No. 4306.0). Also, some targets have not been well chosen. The target to 'increase the amount of low and reduced alcohol beer from 14.5% of all beers to 20% in 10 years' was chosen on nutritional grounds alone; because of other public health action relating to alcohol abuse, it has been exceeded after three years (see Figure 1.20).

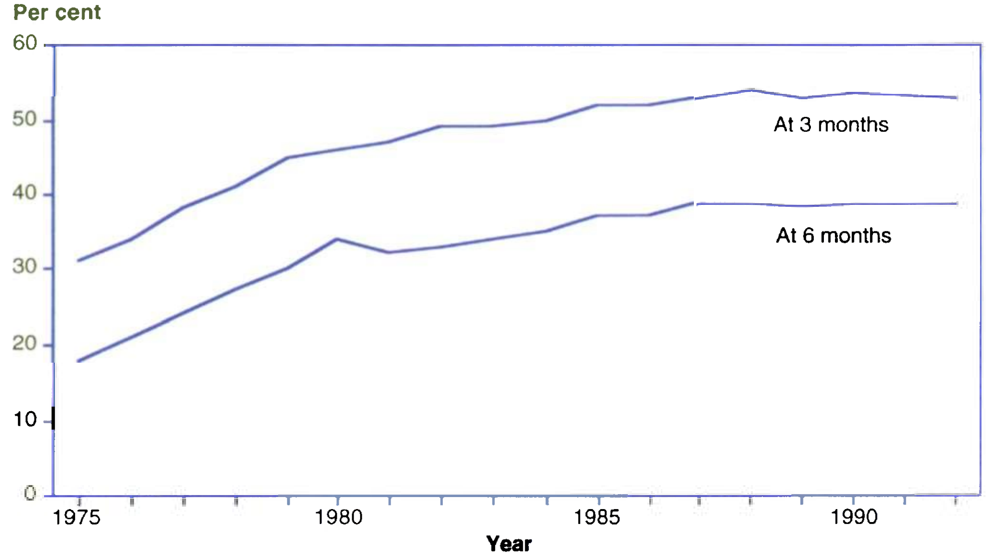


Sources: ABS Cat. No. 4306.0; Nutbeam et al. 1993

Figure 1.20: *Trends in reduced-alcohol beer as a proportion of total beer supply*

Breastfeeding

The 1989–90 ABS National Health Survey (unpublished) and a small survey conducted by the Brotherhood of St Laurence in 1992 (Gilley 1993) found self-reported percentages of 77% and 78% breastfeeding at discharge from hospital. In 1983 the rate was 85% (Palmer 1985). The earlier trend to increasing breastfeeding at 3 and 6 months, as shown in Figure 1.21, has also ceased. In 1991–92, 53% of Victorian mothers were fully breastfeeding at 3 months and 39% at 6 months (Nursing Mothers Association of Australia 1993).



Source: Nursing Mothers Association of Australia unpublished data

Figure 1.21: *Mothers fully breastfeeding at 3 and 6 months, Victoria, 1975 to 1992*

The National Health Survey asked mothers aged 18 to 50 years with a child aged 5 years or less at the time of interview whether they had breastfed (or were breastfeeding) and duration of breastfeeding. The survey showed that mothers aged 25 to 34 years had the highest proportion reporting breastfeeding (80%) followed by mothers aged 18 to 24 years (77%) and 35 to 44 years (71%). Women aged 45 to 50 years indicated that they were more likely to have bottle-fed babies. Of mothers who breastfed, most were likely to have breastfed between 6 and 12 months (37%). Only 7% of breastfeeding mothers did so for longer than 18 months. The Brotherhood of St Laurence survey also found that mothers on low incomes were less likely to breastfeed, and that between 4 and 7 months, the rate of breastfeeding fell to 58%.

The National Health Survey indicated that younger mothers were likely to have breastfed for shorter periods than older mothers; 48% of mothers aged 18 to 24 years breastfed for less than 3 months, 32% for more than 6 months, and 10% for more than 12 months. In comparison, 74% of mothers aged 35 to 44 years and 63% of mothers aged 25 to 34 years breastfed for more than 6 months; and 40% of mothers aged 35 to 44 years breastfed for more than 12 months.

Nutrient intakes

To tell whether nutrient intakes are adequate we must compare them with nutrient requirements. These, however, vary widely from one individual to another, even when age, sex, activity level, height and weight are taken into account, so that direct measurement of biochemical and clinical indicators is the only way to assess an individual's status. At the population level, however, Recommended Dietary Intakes (RDIs) may be used as indicators of groups within the population whose intakes of nutrients are relatively low, and whose nutritional status thus requires closer examination. RDIs are set at a level where they are almost certainly higher than physiological requirements—they are based on an estimate of requirement plus a safety margin, so where groups do have intakes below RDIs, these intakes are not necessarily inadequate. A level below 0.7 RDI is often used as an indicator that further examination is needed; this approximates the 'safety margin' for most nutrients, and therefore indicates a level of intake which may not be adequate for individuals with higher than average requirements.

Nutrient intakes of adults

Mean total fat intakes were 35% of energy (14% from saturated fatty acids) in the 1988 national survey, and 32% (13%) in the 1989 survey of the elderly (Table 1.17).

Table 1.17: *Macronutrient intake and contribution to energy intake, selected surveys, 1980s*

	Intake (g/day)		Contribution to energy (per cent)	
Survey/nutrient	Men	Women	Men	Women
1983 National Dietary Survey of Adults (age 25 to 64)				
Protein	106	74	16.4	17.0
Fat	110	76	37.0	38.0
Carbohydrate	274	192	39.8	41.5
Alcohol	25	9	6.5	3.5
1988 Australian Health and Nutrition Survey (age 18 and over)				
Protein	89	78	15.9	17.0
Fat	90	75	35.1	36.6
Carbohydrate	268	222	45.1	45.6
Alcohol	12	5	3.7	1.8
1989 CSIRO Survey of Elderly Australians (age 55 and over)				
Protein	82	75	15.3	16.2
Fat	81	68	33.0	32.0
Carbohydrate	271	246	47.7	50.0
Alcohol	13	5	4.1	1.8

Sources: Commonwealth Department of Health 1986; CSIRO Division of Human Nutrition unpublished data

Unfortunately, the data from these surveys are not directly comparable, because of the different data collection methods and age groupings used.

The food supply is more than adequate to meet the RDIs of elements and vitamins, and data from dietary surveys confirm that inadequate intakes of micro-nutrients are uncommon. There are, however, identifiable subgroups within the population with low intakes of some nutrients. Groups with intakes below 0.7 of the RDI are usually regarded as meriting closer examination (Table 1.18).

Table 1.18: *Proportion of persons with intakes on survey day below 0.7 RDI and 0.5 RDI, selected nutrients, by age and sex, 1988 and 1989*

			Per cent with intakes:	
Nutrient / Sex	**Age range**	**Year**	**< 0.7 RDI**	**< 0.5 RDI**
Iron				
Women	18–59	1988	15	4
Calcium				
Men	40 and over	1988	13	5
	54 and over	1989	13	6
Women	18 and over	1988	13	5
	54 and over	1989	30	12
Zinc				
Men	40–59	1988	na	6
	60 and over	1988	na	9
	54 and over	1989	na	4
Women	40–59	1988	na	6
	60 and over	1988	na	13
	54 and over	1989	na	4
Magnesium				
Men	18 and over	1988	na	9–16
	54 and over	1989	na	9–16
Folate				
All persons	18 and over	1988	na	5–17
	54 and over	1989	na	5–17

Source: CSIRO Division of Human Nutrition unpublished data

In addition to the intakes shown in Table 1.18, the Survey of the Elderly also suggested low intakes of vitamin B-12 by 3% of women aged 54 years and over (there were no data for men) and low intakes of vitamin E in 4% of women and 13% of men aged 54 years and over. Of those aged 70 years and over, 5% of women had low intakes of vitamin B-12; 5% of women and 8% of men had low intakes of vitamin E.

In 1982 the average sodium intake of Australian adults was 130–200 mmol/day with certain individuals habitually consuming more than 400 mmol/day (NHMRC 1984). Estimated sodium intakes from the 1988 Australian Health and Nutrition Survey and the 1989 CSIRO Survey of the Elderly were much lower (see Table 1.19). Potassium intakes for the 1988 and 1989 surveys were similarly much less than had been estimated in 1982.

Table 1.19: *Sodium and potassium intake, by sex (mmol/day)*

Survey / Sex	Sodium	Potassium
Recommended dietary intake		
All adults	40–100	50–140
NHMRC working party, 1982		
All adults	130–200	na
1988 Australian Health and Nutrition Survey		
Men	54	52
Women	45	49
1989 CSIRO Survey of the Elderly		
Men	45	55
Women	39	57

Sources: NHMRC 1984, 1991; CSIRO Division of Human Nutrition unpublished data

Nutrient intakes of children

The National Dietary Survey of Schoolchildren (Department of Community Services and Health 1989) was carried out in 1985 and dietary surveys of schoolchildren were carried out in Western Australia in 1987 and 1988 (Jenner & Miller 1991), using a comparable data collection method. In 1985 more than 20% of the energy intake of children came from soft drinks, confectionery, other foods with a high added sugar content (for example biscuits, cakes), takeaways and snack products. Data matched for age from the three surveys are given in Table 1.20 (page 54). Energy intakes were similar at 11 and 12 years, with girls' intakes 87–90% those of boys, and there was no apparent trend over time for macro-nutrients.

The National Dietary Survey of Schoolchildren aged 10 to 15 years indicated that calcium intakes were a concern in that age group, particularly for girls. Over 40% of girls (12 to 15 years) and boys (12 and 13 years) had intakes less than 0.7 RDI, with one-quarter being less than 0.5 RDI. This merits further investigation.

Nutritional deficiencies

Food supply and dietary intake data suggest that nutrient deficiencies should be uncommon. The two nutrients of most concern are calcium and iron. At present, dietary intake and food supply data are available only for calcium.

There have been two Australian surveys of iron status. English & Bennett (1990) have reported a 9.2% prevalence of iron deficiency in girls aged 15 years. An iron status study of 1,704 men and 4,267 women aged 20 to 69 was undertaken in 1989, in conjunction with the National Heart Foundation Risk Factor Prevalence Survey. Less than 1% of men, but 7.5% of women, were iron deficient, with women of reproductive age most likely to be so (Lester 1994).

Diet-related diseases

What are the diet-related diseases?

Diet-related disease in Australia is due more to overconsumption than to deficiency. The major causes of death, illness and disability in Australia thought to have an overconsumption component in their aetiology are coronary heart disease, stroke, hypertension, atherosclerosis, some forms of cancer (stomach, colon, rectal, breast and endometrial), non-insulin-dependent diabetes mellitus (NIDDM), osteoporosis, dental caries, gall bladder disease, and non-cancer disorders of the large bowel (diverticular disease and constipation).

Table 1.20: *Nutrient intake of children, by age and sex, selected surveys, 1980s*

Survey / Age / Nutrient	Intake (g/day unless stated) Boys	Intake (g/day unless stated) Girls	Contribution to energy (per cent) Boys	Contribution to energy (per cent) Girls
1985 National Dietary Survey of Schoolchildren, 11 years				
Energy (MJ)	8.5	7.4	100.0	100.0
Protein	74	63	15.1	14.5
Fat	85	72	36.6	35.6
Total carbohydrates	255	227	48.1	49.5
Fibre	18	16		
Calcium (mg)	883	724		
Number of respondents	*459*	*460*		
1987 Western Australian survey, 11 years				
Energy (MJ)	8.4	7.6	100.0	100.0
Protein	70	63		
Fat	84	78	36.8	37.8
Saturated fatty acids	35	35	15.5	16.7
Total carbohydrates	256	227	48.0	48.8
Fibre	18	15		
Calcium (mg)	870	770		
Number of respondents	*61*	*57*		
1985 National Dietary Survey of Schoolchildren, 12 years				
Energy (MJ)	8.8	7.7	100.0	100.0
Protein	75	64	14.6	14.3
Fat	88	77	36.3	36.6
Total carbohydrates	268	233	48.9	48.9
Fibre	19	16		
Calcium (mg)	930	790		
Number of respondents	*456*	*479*		
1988 Western Australian survey, 12 years				
Energy (MJ)	8.6	7.5	100.0	100.0
Protein	71	60		
Fat	84	75	36.1	36.5
Saturated fatty acids	34	25	14.3	14.4
Total carbohydrates	264	231	49.6	49.5
Fibre	19	17		
Calcium (mg)	990	830		
Number of respondents	*626*	*589*		

Sources: Department of Community Services and Health 1989; Jenner & Miller 1991

Alcohol consumption, total energy consumption, total fat consumption, dietary fatty acid profiles, and sodium and fibre intake are important factors in health. For example, high sodium and alcohol intakes and weight gain (excess energy intake) are associated with hypertension; potassium and dietary fibre intakes may be inversely related to hypertension, and so also may dietary calcium and magnesium. Obesity—the result of chronic energy overnutrition—is a morbid condition in itself, and a risk factor for several other conditions.

The prevalence of diabetes mellitus (including insulin-dependent diabetes mellitus) in Australia is estimated at 4%, but 11% in those over 65 years; in the older age group, almost all have NIDDM. It was also estimated that of approximately 500,000 Australians with diabetes, up to half are undiagnosed (Diabetes Australia NSW unpublished data).

The only deficiency conditions of any significance are the nutritional anaemias, particularly iron-deficiency anaemia. There is little information on incidence of these.

The contribution of diet to diet-related disease

The importance of a disease or group of diseases depends on how importance is viewed and measured. Indicators of mortality, morbidity and cost can give different impressions of the impact of a disease or disease group. Although only 2% of deaths can be related to diet, the proportions of health service expenditure attributed to diet include 6% of recurrent hospital expenditure, 5% of medical expenditure, 9% of pharmaceutical expenditure, 14% of nursing home expenditure and 24% of expenditure on allied health professional services. The last largely comprises expenditure on dental services, of which it is estimated that 75% is related to the treatment of dental caries, of which 50% is taken to be due to diet.

The cost to the community of diet-related disease

The direct cost of health care services—hospital, medical, pharmaceutical, allied professional and nursing home—for diet-related disease was estimated to be $1,432 million in 1989–90. The estimated direct cost of alcohol-related disease was $430 million. These direct costs total $1,862 million. When $1,418 million indirect costs (i.e. the earnings forgone through illness and premature death) of diet- and alcohol-related disease are added, the total estimated cost of diet- and alcohol-related disease in 1989–90 rises to $3,280 million (Table 1.21, page 56).

Equity and nutrition

Adequate nutrition depends on a quality food supply being affordable and available, and the ability to make discerning choices from the food available depends on the individual's food, health and social skills and knowledge. Many associations with poor nutrition are thus social or socioeconomic in origin.

A survey of 874 urban residents found differences in macro- and micro-nutrient patterns when examined separately by occupational prestige, education level, income and occupational category. High social status was positively associated with nutrient densities for iron, zinc, magnesium, potassium and with intake of natural sugars, and inversely associated with energy from fat (Smith & Baghurst 1992, 1994). In an earlier survey of 291 South Australians aged 18 and over, there was no correlation between occupational status (based on head of household status) and measured zinc and magnesium levels in blood to determine nutritional status for these nutrients, although there were many respondents whose dietary intakes were below the RDIs for these nutrients (Baghurst et al. 1991).

Table 1.21: *Impact of diet-related (including alcohol-related) diseases, 1989–90*

	Number	Cost ($m)	Per cent of total[a]
Mortality			
Deaths	37,636		30.30
Potential years of life lost to age 75	95,817		
Morbidity and cost of health care			
Hospital admissions	206,287	594	6.05
Hospital bed–days	1,902,834		
Medical consultations	6,806,599	212	4.35
Pharmaceutical scripts	15,728,911	221	8.81
Allied professional care referrals	233,026	517	21.19
Nursing home admissions[b]	3,311	317	13.88
Total direct costs		*1,862*	
Indirect costs			
Forgone earnings due to premature death		1,222	
Absenteeism		196	
Total indirect costs		*1,418*	
Total costs		**3,280**	

(a) Per cent of total relevant expenditure 1989–90, except for deaths which is per cent of all deaths in 1989.

(b) Includes only patients who are transferred from hospitals to nursing homes.

Sources: Crowley et al. 1992 (updated); AIHW unpublished data

Occupational prestige and education, but not income, were directly associated with nutrient densities for carotene, vitamin C, thiamine, folic acid and—weakly—niacin and fibre intake in the larger survey; energy from mono-unsaturated fatty acids and from saturated fatty acids was inversely associated with occupational prestige (strongly for mono-unsaturates) and education (weakly). Retinol density and total energy intake (weak) were inversely associated with occupational prestige; alcohol intake was strongly associated with income and weakly with occupational prestige; starch intake was inversely associated with income. There were also significant differences for occupation category for several nutrients and for energy, alcohol, and fibre (Smith & Baghurst 1992, 1994).

Sole parents and their dependants

Sole parents are an economically and socially disadvantaged group, and five out of six single parents are women. Crotty, Rutishauser & Cahill (1992) studied 29 sole-parent families with low incomes in Geelong in 1989–90. They spent about the same amount ($28) on cereals, dairy products, fruit and vegetables as the average for all households in the 1988–89 Household Expenditure Survey, but this was 48% of their food expenditure compared with the 30% average for all households. Less was spent on meat and non-alcoholic beverages ($11 against $27, or 18% against 28%). There was a 'marked difference in expenditure on food in the first and second weeks of a Social Security payment fortnight' that was reflected in the energy and nutrient intakes for the two weeks only as a lower median vitamin C intake in the second week.

The 1985 National Dietary Survey of Schoolchildren found that boys of 10 to 11 years from single-parent homes had lower intakes of nutrients than boys from two-parent homes. Of girls from single-parent families, 35–38% (the exact figure depending on age) reported iron consumption below 0.7 RDI compared with 26–29% of girls from two-parent families (Lester 1994).

Rural–urban differences

Rural children in 1985 consumed more vegetables, milk and milk products, and meat and meat products than did urban children. Generally, rural-dwelling boys had higher nutrient intakes than urban boys, but 25–29% of rural girls reported vitamin A consumption below 0.7 RDI compared with 35–38% of urban girls. A difference was also found in cereal consumption: urban children at 10 and 15 years ate more bread, whereas rural boys but not girls ate more breakfast cereals (see Table 1.22).

Table 1.22: *Trends in bread and breakfast cereal consumption, by age, sex and area of residence, 1985 (g/day)*

	Boys				Girls			
	Urban		Rural		Urban		Rural	
Food	**Age 10**	**Age 15**	**Age 10**	**Age 15**	**Age 10**	**Age 15**	**Age 10**	**Age 15**
Bread	82	131	78	115	79	81	64	74
Breakfast cereal	44	59	58	77	36	34	37	29

Source: AIHW unpublished data

The 1985 Victorian Nutrition Survey showed very little difference between adult metropolitan and non-metropolitan respondents, but this may be because Victoria is a highly urbanised state, with no remote areas.

Sex

The 1989–90 National Health Survey found that women were more likely than men to have taken a health-related action, to be underweight, and to be taking vitamin and mineral supplements; and that more women than men reported changing their diets for reasons related to health (ABS unpublished data). Also, 43.3% of women but only 37.9% of men reported changing their diets in the preceding two years. The greatest difference in dietary habits between women and men is in the consumption of alcoholic beverages, with women consuming much less beer than men (Table 1.23, page 58).

Physiological requirements for several nutrients, notably iron and calcium, are different for men and women, and this is reflected in RDIs. The RDI for calcium is higher for post-menopausal women, who are at higher risk of osteoporosis. Menstruation greatly increases the risk of iron deficiency, and pregnancy increases the requirement for many nutrients. For example, pregnant women are at higher risk of anaemias due to folic acid deficiency and iron deficiency.

Ethnicity

Using language spoken at home as an indicator of non-English-speaking background, there were important differences in calcium and iron intakes by ethnic group (Table 1.24). Vitamin A intakes for girls and zinc intakes for boys were higher where English was spoken at home. Meat consumption of girls from non-English-speaking backgrounds was 20% lower at age 15 than at age 10; this was very different from the 45% higher consumption at age 15 for girls from English-speaking backgrounds compared with their counterparts aged 10 years.

Table 1.23: *Alcoholic beverage intake of women as per cent of men's intake, by age, 1988 and 1989*

Survey / Age group	All beers	Standard beer	Low alcohol beer	Wine	Sherry, port, liqueurs	Spirits
1988 Australian Health and Nutrition Survey						
18 to 39	10	9	14	114	85	75
40 to 59	17	11	33	106	97	116
60 and over	8	6	14	55	65	41
All ages	11	9	20	96	81	78
1989 CSIRO Survey of the Elderly						
54 to 59	10	9	12	91	122	37
60 to 64	14	10	19	70	81	43
65 to 69	18	8	33	65	80	42
70 and over	21	17	36	77	103	88
All ages	14	11	22	79	96	49

Source: CSIRO Division of Human Nutrition unpublished data

A survey of 200 Vietnamese migrant women in Adelaide in 1989 (Table 1.25) found that the diets of the sample were lower in fat and fibre but higher in total carbohydrate and protein than for all Australian women (Baghurst, Syrette & Tran 1991; CSIRO unpublished data).

Further nutrition monitoring

AIHW has the responsibility to develop a comprehensive nutrition monitoring and surveillance system for Australia, which is one of few developed countries not to have such a system in place. The first major monitoring activity scheduled is a national dietary survey in 1994–95, in conjunction with the next ABS National Health Survey.

Table 1.24: *Nutrient intake differences between children of English-speaking and non-English-speaking backgrounds, 1985*

	Per cent < 0.7 RDI	
Nutrient / Sex	**Non-English**	**English**
Iron		
Female	27	32–42
Calcium		
Female	45	56
Male	33	47

Source: AIHW unpublished data

Table 1.25: *Mean daily nutrient intake, Australian and Vietnamese women*

Nutrient	Australian women, 1988	Vietnamese migrant women, Adelaide 1989
Number of respondents	*2,410*	*200*
Protein (g)	73.6	89.8
Fat (g)	76	55
Carbohydrate (g)	192	**249**
Dietary fibre (g)	19.3	15.5
Energy value (kJ)	7,386	7,530
Calcium (mg)	712	520
Iron (mg)	11.2	10.2
Retinol equivalents (µg)	1,362	179
Vitamin C (mg)	102	101
Thiamin (mg)	1.04	1.25
Riboflavin (mg)	1.76	1.18
Niacin equivalents (mg)	28.6	17.0
Zinc (mg)	10.2	10.8

Sources: Baghurst, Syrette & Tran 1991; CSIRO Division of Human Nutrition unpublished data

1.4.2 Other major risk factors for disease

Risk factors are attributes, exposures or other factors that are believed to increase the risk of ill-health. *Australia's health 1992* listed risk factors associated with major causes of morbidity, disability and death. It also provided prevalence estimates for selected risk factors using data from the 1989 National Heart Foundation Risk Factor Prevalence Survey (RFPS) and the 1989–90 ABS National Health Survey (NHS), which are still the most recent sources of national data on risk factors. This section reviews further data from these surveys and from other recent Australian studies. It deals with risk factors mainly from the perspective of heart disease.

Cholesterol

The National Heart Foundation defines a plasma cholesterol level of over 5.5 mmol/L as indicating an increased risk of heart disease for adults, and one of over 6.5 mmol/L as indicating a high risk of coronary heart disease (CHD). The 1989 RFPS (Risk Factor Prevalence Study Management Committee 1990) found that among people aged 20 to 69 years, 47% of men and 39% of women had plasma cholesterol levels of 5.5 mmol/L or more, and 16% of men and 14% of women had levels of 6.5 mmol/L or more.

The Australian Consensus Panel for the Management of Hyperlipidaemia (raised levels of cholesterol and other blood lipids) has stated that there is strong scientific evidence linking blood cholesterol level with the development and progression of atherosclerosis and subsequent CHD (Consensus Panel 1992). This panel recommended that dietary modification, by restricting total and saturated fat intake, should be the first step in treatment for people with high blood cholesterol. Together with moderate physical exercise, this dietary modification should reduce body fat, particularly abdominal body fat.

Blood pressure

Hypertension (high blood pressure) is an independent risk factor for CHD and stroke (MacMahon et al. 1990). The National Heart Foundation's 1989 RFPS defined hypertension as systolic blood pressure of 160 mmHg or greater and/or diastolic blood pressure of 95 mmHg or greater and/or receiving treatment for blood pressure, and estimated that 18% of men and 14% of women are hypertensive. The prevalence of hypertension increases steadily with age in both sexes.

The (New South Wales) Lower Hunter Stroke Study provides evidence of the importance of hypertension in stroke in people aged 35 to 69 years (Al-Roomi et al. 1992). The risk of first stroke for those being treated for high blood pressure was 3.1 times that for people not being treated for high blood pressure. Further, those being treated for high blood pressure were 5.5 times more likely to suffer a haemorrhagic stroke and 2.5 times more likely to suffer a non-haemorrhagic stroke than those not being treated for high blood pressure.

Smoking

It has long been acknowledged that cigarette smoking is a major cause of cardiovascular disease (United States Department of Health and Human Services 1983). A recent Australian study (Chun, Dobson & Heller 1993) examined the effect of smoking on the incidence of CHD in men and women aged 35 to 69 years. It found that men who are current smokers had 2.9 times the age-adjusted risk of a first coronary event (fatal or non-fatal) in non-smokers. The corresponding risk for female current smokers was 3.5 times.

Box 1.10: Measuring obesity

Measurements in surveys must be taken according to precise instructions so that they are reproducible, and comparable between observers and survey centres. In the 1989 Risk Factor Prevalence Study, participants were measured wearing light street clothing, including socks or stockings, but without shoes, coats, jumpers, belts or sashes. Measured heights were not adjusted, but 1 kg was deducted from measured weight to allow for the clothing.

Body mass index (BMI) is calculated as weight in kilograms divided by the square of height in metres:

- *Underweight was used to describe a BMI of less than 20.0.*
- *Acceptable weight was used to describe a BMI of 20.0 to 25.0 inclusive.*
- *Overweight was used to describe a BMI of over 25.0 up to and including 30.0.*
- *Obese was used to describe a BMI of over 30.0.*

Waist-to-hip ratio (WHR) is, as its name suggests, calculated as the ratio of waist and hip measurements. Waist circumference was measured at the end of normal expiration around the narrowest point between the ribs and the hips when viewed from the front. Hip circumference was measured at the point of maximum extension of the buttocks when viewed from the side. Both measurements were taken in the horizontal plane, and the skin was not compressed. Two measurements were taken of each with a metal tape, recorded to the nearest 1 cm, and averaged.

Pregnant women were excluded from the calculations for both measures.

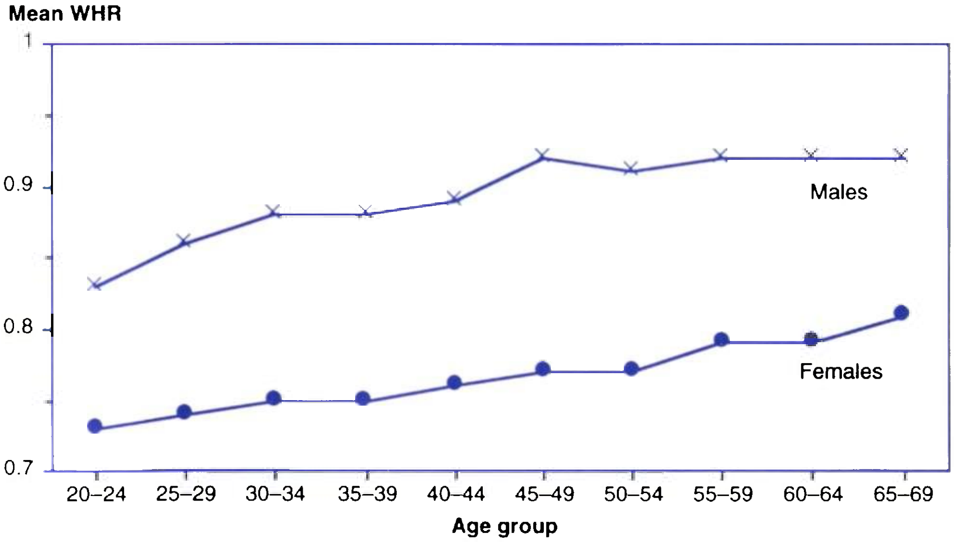
There is also mounting evidence that passive smoking is associated with increased risk of heart disease (Steenland 1992). In a study of residents of the lower Hunter region of New South Wales aged 35 to 69 years, Dobson et al. (1991) estimated that 13% of non-smoking (both never smokers and ex-smokers) healthy men and 19% of non-smoking women were exposed to tobacco smoke at home. The prevalence of passive smoking at work was similarly estimated to be 44% for non-smoking men and 37% for non-smoking women. Exposure to passive smoking at home was found to be associated with excess risk of heart attack or death for both sexes.

Excess weight for height

Overweight and obesity are risk factors for many diseases including CHD (Pi-Sunyer 1991). It has been suggested that abdominal obesity, as measured by waist-to-hip ratios (WHR, see Box 1.10), may be a better indicator of risk of developing CHD than whole-body measures such as body mass index (BMI) (Björntorp 1992; Kannel et al. 1991).

Boyle et al. (1993) analysed data from the 1989 RFPS to provide 'normal' values for WHR ratios in Australian men and women. Mean WHR was 0.89 for men and 0.76 for women. A WHR of 1.0 for men and 0.9 for women is indicative of excessive abdominal obesity (Bray 1987); 5.2% of men and 2.6% of women had a WHR above these levels.

WHR increased with age in both men and women. For men, most change in WHR occurred before age 45 whereas for women the change was greatest after age 50 (Figure 1.22).



Source: Adapted from Boyle et al. 1993

Figure 1.22: *Average waist-to-hip ratio by age and sex*

There were some differences between the patterns of WHR and BMI. For example, average WHR was highest for men in Brisbane and Darwin, despite the fact that these men had relatively lower BMI. Asian-born women had low BMI but had a relatively high average WHR.

WHR and BMI were examined also in relation to other risk factors. High values of both WHR and BMI were found to be associated with lower socioeconomic status and lack of exercise. For men, WHR and BMI increased with increasing alcohol consumption, and BMI decreased with cigarette smoking. Among women, both WHR and BMI increased with smoking and, although mean BMI decreased with alcohol consumption, a U-shaped association was observed between WHR and alcohol consumption.

Alcohol

Excess alcohol intake is associated with many chronic diseases and conditions such as CHD, stroke, hypertension, and certain types of cancer (Kannel 1988; Regan 1990; WHO Study Group on Diet 1990). In addition, excess consumption of alcohol can cause diseases such as liver cirrhosis, alcohol-related brain damage and alcoholic cardiomyopathy (WHO Study Group on Diet 1990). Light to moderate alcohol intake, however, has been shown by many epidemiological studies to be protective against CHD (Rimm et al. 1991; Marmot & Brunner 1991).

Cullen, Knuiman & Ward (1993) used data from Busselton, Western Australia, to examine mortality in 2,171 subjects aged 40 years and over during a 23-year period. Busselton men and women who were moderate drinkers (mean intake of 49.8 g/day for men and 35.5 g/day for women) had a lower risk of mortality from all causes than non-drinkers (Table 1.26). This was also true for cardiovascular disease mortality and for CHD death. Fewer than one quarter of the abstainers in the Busselton study were ex-drinkers, suggesting that the proportion of non-drinkers who may have stopped drinking for health reasons was small.

A survey of public perception of the risks and benefits of alcohol consumption, and the understanding of recommended safe levels of alcohol consumption, was undertaken in 1989 (Hall, Flaherty & Homel 1992). In household interviews of 500 adults aged 18 to 65 years, in metropolitan and rural New South Wales, 46% reported that they had not consumed any alcohol in the past week, 48% were 'safe' drinkers', 3.6% were 'hazardous' drinkers and 2.4% were 'harmful' drinkers as defined by the NHMRC guidelines (see Box 1.12, page 64).

Over 35% of the sample wrongly identified alcohol as the drug responsible for most drug-related deaths (Holman et al. (1988) estimated tobacco to be the cause of most drug-related deaths). One quarter believed that some health benefits, such as relaxation and stress reduction, could be derived from alcohol use.

'Having a drinking problem' was interpreted by 35% of the sample as drinking to excess, and 81% of respondents believed that people who frequently drove a car with a blood alcohol limit of over 0.05 had a 'drinking problem'.

Table 1.26: *Adjusted relative risks for 23-year all-cause mortality (1966 to 1989), Bussleton WA cohort study, by baseline alcohol consumption*

Alcohol consumption category	Number of subjects	Number of deaths	Adjusted RR$^{(a)}$	95% confidence interval
Men (mean intake g/day)				
Non-drinker (0)	154	96	1.00	
Ex-drinker (0)	79	47	0.98	0.68–1.41
Mild (8.9)	517	272	0.84	0.66–1.08
Moderate (49.8)	335	170	0.71	0.54–0.94
p for trend			*0.01*	
Women (mean intake g/day)				
Non-drinker (0)	480	226	1.00	
Ex-drinker (0)	26	9	1.28	0.64–2.57
Mild (4.6)	482	175	0.95	0.77–1.17
Moderate (35.5)	98	26	0.85	0.55–1.32
p for trend			*0.45*	

(a) Relative risk adjusted for age, sex, occupation, smoking, blood pressure, probable or suspected coronary heart disease, forced expiratory volume, diabetes, cholesterol, uric acid and treatment for hypertension.

Source: Cullen, Knuiman & Ward 1993

Women were more likely than men to overestimate the number of drinks that could be consumed with low risk to the health of someone of their own sex. For both men and women, the more they drank, the more they estimated themselves to be at low risk, and the higher their level of education, the less they estimated themselves to be at low risk.

Box 1.11: The risk of drinking

In the 1989 Risk Factor Prevalence Survey, questions were asked about both frequency and quantity of alcohol consumption. These were then used to categorise drinking, separately for women and for men, on a scale ranging from 'no risk' to 'very high risk'. The categories and the associated terminology were:

	Risk category	
	Men	***Women***
Non-drinkers	*None*	*None*
Average daily intake of less than 3 drinks	*None*	*Low*
Average daily intake of 4 drinks, or 9–12 drinks in any day	*Low*	*Intermediate*
Average daily intake of 5–8 drinks, or occasional excess	*Intermediate*	*High*
Average daily intake of 9–12 drinks, or frequent or great occasional excessive intake	*High*	*Very high*
Average daily intake of over 12 drinks	*Very high*	*Very high*

Box 1.12: Safe drinking

In 1992 the NHMRC published revised guidelines for preventing alcohol abuse (National Health and Medical Research Council 1992b):

That the concept of a standard drink, or unit, containing approximately 8–10 g of absolute alcohol be adopted for clinical and educational purposes.

That the following guidelines be promoted as consistent with responsible drinking:

- *that the consumption of alcohol by men should not exceed 4 units or 40 g of absolute alcohol per day on a regular basis, or 28 units per week; that 4–6 units per day or 28–42 units per week be considered as hazardous and that more than 6 units per day or 42 units per week be regarded as harmful;*
- *that the consumption of alcohol by women should not exceed 2 units per day or 14 units per week on a regular basis; that 2–4 units per day or 14–28 units per week be considered as hazardous, and that more than 4 units per day or 28 units per week be considered harmful;*
- *that binge drinking is potentially hazardous;*
- *that all people have at least two alcohol-free days each week;*
- *that abstinence be promoted as desirable in pregnancy;*
- *that people who intend to drive, operate machinery or undertake activities in hazardous or potentially hazardous situations should not drink; and*
- *that specific information be given to drinkers of practical ways of reducing alcohol consumption in social situations.*

Physical activity

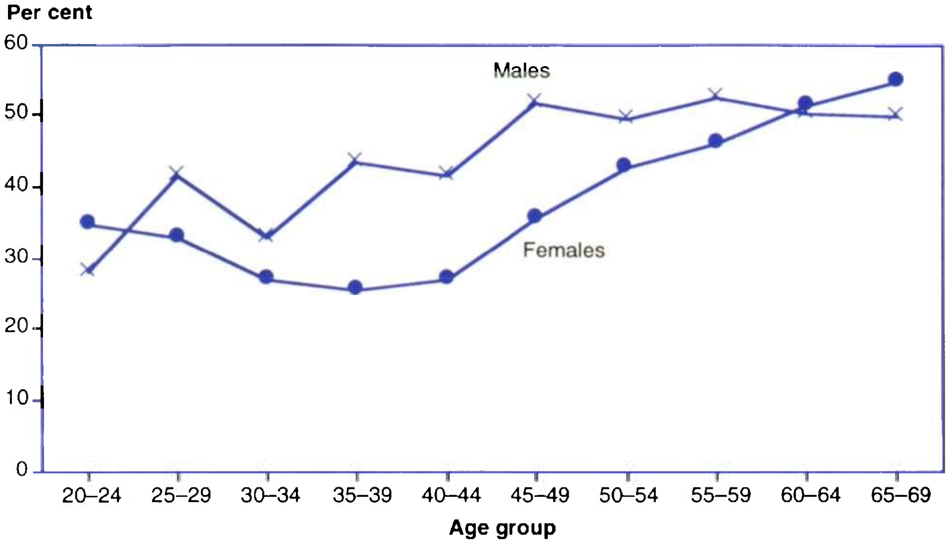
Physical inactivity is a risk factor for the development of coronary artery disease and for mortality from it. Exercise may help to control blood lipid abnormalities, diabetes, obesity and hypertension, and may be protective against osteoporosis (Fletcher et al. 1992; WHO Study Group on Diet 1990). The 1989 RFPS found that 27% of men and women had not undertaken any exercise during leisure time in the two weeks prior to interview (Risk Factor Prevalence Study Management Committee 1990).

Multiple risk factors

The 1989 RFPS (Risk Factor Prevalence Study Management Committee 1990) examined the three major established risk factors for cardiovascular disease—high blood pressure, high blood cholesterol, and cigarette smoking—as multiple risk factors within individuals. The definitions used were:

- high blood pressure: diastolic blood pressure ≥ 95 mmHg
- high blood cholesterol: plasma cholesterol ≥ 6.5 mmol/L
- cigarette smoking: smoking one or more manufactured and/or 'hand-rolled' cigarettes daily (cigar and/or pipe smoking is not included).

The proportion with at least one major risk factor is shown in Figure 1.23. In all, 42% of men and 35% of women had at least one of the three major risk factors, with the prevalence of one or more risk factors generally increasing with age; 8% of men and 5% of women had two or more of the major risk factors.



Source: Risk Factor Prevalence Study Management Committee 1990

Figure 1.23: ***Proportion of men and women with at least one major risk factor (high blood pressure or high blood cholesterol or cigarette smoking)***

Chun, Dobson & Heller (1993) found that men who smoked and also had a history of hypertension were 4.6 times more likely to suffer a coronary event (fatal or non-fatal) than non-smokers without a history of hypertension. The equivalent figure for women was 7.9 times.

1.5 National health goals and targets

Setting goals and targets is generally recognised as good management practice. In the health area, goals and targets indicate the desired direction and pace of change in pursuing improvements in the health of the population. Nutbeam et al. (1993) noted: 'They are intended to inspire, to motivate, and to encourage cooperation among all those individuals and sectors whose actions affect the health of the community. National goals and targets support decisions about national health priorities and provide a mechanism to monitor and review progress — a means of assessing the effectiveness of the combined actions taken to improve the health of all Australians.'

Stevenson (1993) defined the main components of a set of goals and targets. A *goal* is a broad statement of a desired improvement in the health of the population. An example of a goal is: 'To reduce the impact of coronary heart disease on the health of Australians.'

An *indicator* is a specific and measurable way of assessing progress towards the goal. A goal may have more than one indicator. For example, indicators which could be used with the above goal are mortality rates and morbidity rates from heart disease.

A *target* is the value of the indicator which will be regarded as a measure of achievement of the goal. For example, Nutbeam et al. (1993) included a 30% reduction in mortality from heart disease among men aged 30 to 64, by the year 2000, as a target.

Development of health goals and targets for Australia

In 1985, the Commonwealth Government established the Better Health Commission, which reported in 1986. Health goals and targets in a number of areas were included in its report. Later, the Australian Health Ministers' Advisory Council established the Health Targets and Implementation (Health for All) Committee. Its principal task was to develop a set of health goals and targets, with the aim of reducing inequalities in health. The 1988 report from this Committee contained a set of goals and targets that focused on specific population groups, major causes of illness and death, and risk factors. It later became apparent that not only had these goals and targets not been adopted and used by the mainstream health professions, but that they were also not helpful in addressing the underlying causes of ill-health.

As a result, a new and more comprehensive set of National Health Goals and Targets (NHGT) was developed by Nutbeam et al. (1993). Subsequently, an expert group was established to develop a strategy for finalising and implementing the NHGT. Its key tasks were to select areas of focus for national agreement and action, and to establish implementation groups for each area. At the April 1993 Health Summit, the Australian Health Ministers agreed to four areas for implementing NHGT: cardiovascular disease, cancers, injury and mental health.

A core function of AIHW is to monitor and report on progress towards the new range of national health targets. Without a clear mechanism and systematic approach to monitoring and formal reporting, these goals and targets will remain no more than an interesting set of proposals.

The Institute has therefore stressed the need for a uniform and integrated approach to further development, and the implementation and monitoring of the NHGT. It has reviewed the data and associated monitoring requirements for the goals and targets proposed by Nutbeam et al. (1993) and has assisted in the data provision for the expert implementation groups for each area of focus, which are due to provide provisional reports in March 1994. The groups are responsible for recommending a final set of goals and targets and for developing five-year implementation plans. Under the Medicare Agreements, this process will be completed by 1 July 1994.

Issues in goal and target setting

The development of goals, indicators and targets will vary according to the specific subject area and is primarily a matter of judgement by subject matter experts. However, the application of good statistical practice to their development will help ensure that the goals and targets are attainable, and will enhance their use as health policy tools.

Stoto (1990), Stevenson (1993) and Mathers, d'Espaignet & Stevenson (1993) have examined the issues involved in setting health goals and targets. These are discussed below and illustrated with an example—the development of a target for coronary heart disease.

Criteria for setting national health goals

Criteria for setting national health goals should include:

- the public health significance of the goal;
- the availability of and the will to implement effective and efficient interventions to achieve the goal; and
- the availability of a measurable health indicator relating to the goal.

The second criterion is sometimes overlooked. Goals should be a statement of an objective we are consciously seeking to attain through intervention, whether that be health promotion campaigns, prevention programs, or treatment programs. If there is no strategy or set of interventions aimed to address a health problem, a goal should not be set. Similarly, if there are known effective interventions for a health problem, but the will does not exist to implement them or if they are unacceptable to the community, there is no point in setting a goal.

A national goal for coronary heart disease satisfies all three criteria—it is a leading cause of death for Australians, there are known risk factors which can be addressed, and there are suitable indicators.

Choosing the indicator

The primary issues in choosing indicators for health goals are that the indicators need to:

- be valid;
- be defined in a standard manner;
- be able to be measured; and
- have at least quasi-national and comparable data available at suitable intervals for monitoring purposes.

Validity

An indicator needs to have validity—that is, fidelity in measuring progress towards the goal. The indicator must be interpretable and its values must be meaningful in relation to the goal. For example, an age-standardised mortality rate for coronary heart disease is directly interpretable as measuring changes in mortality rates, excluding the effects of changes in the population age structure, and as a meaningful and interpretable indicator of progress towards a goal of reducing the impact of coronary heart disease.

Proxy indicators and process indicators may also be appropriate for some goals, as long as they are interpretable and bear a meaningful relationship to the goal. For example, using apparent consumption of fat per capita may be an acceptable indicator for monitoring a dietary goal. A process indicator may be appropriate where it relates directly to a major intervention strategy and where the causal link between the process and the outcome (referred to in the goal) is well established. An example is the proportion of women who have had a screening mammogram in the last three years, as an indicator for a goal to prevent breast cancer.

Indicators need to be chosen carefully to reflect the nature of the health goals to which they refer. Incidence measures are preferable for prevention activities that seek to avoid new occurrences of a health problem or acquisition of a risk behaviour, whereas prevalence measures are preferable for goals that seek to reduce the impact of a health problem or risk factor. In practice, the choice of indicator is limited by the kinds of data that are available and prevalence measures may have to be used as proxies for incidence measures.

Definition of an indicator

The indicator should be defined in the way most suitable for monitoring progress towards the goal. For example, a target for serum cholesterol could be phrased as 'to achieve a mean blood cholesterol level among men aged 20 to 69 of 5.5 mmol/L'.

Definitions are arrived at after consultation with experts in the field and recommended for use in all data collections unless there are adequate reasons for not doing so. This is to ensure that the same information is collected on an activity or status, irrespective of where collection occurs. The National Health Data Dictionary (see Section 5.1, page 203) is an appropriate vehicle for disseminating information on recommended indicators. This approach provides a useful framework for coordinating statistical definitions in population health monitoring work being carried out at Commonwealth and State and Territory level.

As well as definitions relating to classification, such as smoker/non-smoker, there is a need to establish standards for the construction of indicators, such as the standard population for use in age-standardisation of indicators. Additionally, since some indicators will be based on data collected through sample surveys, there may be a need to agree on standard instruments, for example preferred questionnaire wording, as well as on standard definitions and classifications.

Measurement of an indicator

An indicator is useful only if it can be measured. For example, it may not be appropriate to establish a national goal for reducing pain in the Australian population (desirable though that goal may be) unless there is a validated measurement instrument which can be used to construct an indicator of pain at the population level.

Data availability for monitoring

In order to measure progress towards national health goals, data for a measurable health indicator must be available for a national or quasi-national population over time. National data collections such as the AIHW mortality databases should be used where relevant. If national data are unavailable, quasi-national data may be used. For example, data from two or three States might be aggregated, or the National Heart Foundation Risk Factor Surveys of capital city residents could be used. However, the coverage of such an indicator must be sufficient to give it credibility as a measure of progress towards a national goal. Data from small-scale surveys do not have this credibility.

In addition, data must be available on a comparable basis at repeated time intervals if progress towards a goal is to be monitored. For example, there are two main ways of measuring obesity (see Box 1.10 on page 60). Some authorities recommend using waist-to-hip ratio (WHR). This gives a more direct measure of abdominal fat, which is thought to be a more important health risk factor. However, WHR has not been widely assessed in populations, so baseline data is less likely to be available than for body mass index, which has been widely used for a longer time. Hence, choosing an indicator of obesity requires consideration of the trade-off between using one measure with readily available baseline data and another possibly more appropriate measure with less readily available baseline data.

Data from the ABS National Health Survey will be available at five-year intervals, probably the maximum time between measurements that is useable for monitoring progress towards a goal. Even then, it will be barely possible to measure progress towards year 2000 goals using such data, as there will be only two national health surveys between now and the year 2000. A substantial change in an indicator between 1994–95 and 1999–2000 may be encouraging, but it will be difficult to be sure that we have made progress until further indicator values confirm that a trend is real.

Each indicator should be accompanied by documentation of the data sources used in its formulation. If no data currently exist, a suitable strategy for obtaining them should be identified. Examples of such strategies may be to include questions annually on the ABS Population Survey Monitor to supplement the five-yearly data from National Health Surveys or to explore further the coordinated use of telephone interviewing by State health authorities.

An indicator for coronary heart disease

Several indicators are suitable for use with goals for coronary heart disease, but we will concentrate on the simplest—mortality from coronary heart disease. This indicator is unambiguously defined and, since mortality data in Australia are routinely collected and published, it is easily monitored.

The patterns of the disease are different for men and women, so the indicators should be measured separately by sex. As we are most interested in preventing premature death, the example will exclude the elderly. The indicator will be the annual age-standardised death rate from coronary heart disease for men aged 30 to 64 years, with the rates standardised to the 1988 Australian population.

Specifying target values

Setting target values is primarily a matter of judgement by subject matter experts, but there are some statistical principles and techniques which can help.

Statistical modelling can help form judgements about the target values and dates. At the simplest level, models can estimate an underlying trend and projection for the indicator. The implication is that targets should usually be more favourable than the figure suggested by the trend analysis.

For example, trend analyses carried out at the AIHW show that the estimated current annual average fall in coronary heart disease mortality among men aged 30 to 64 is approximately 5.5%. Thus, on current trends, the target value should require an average annual fall in mortality of at least 5.5%.

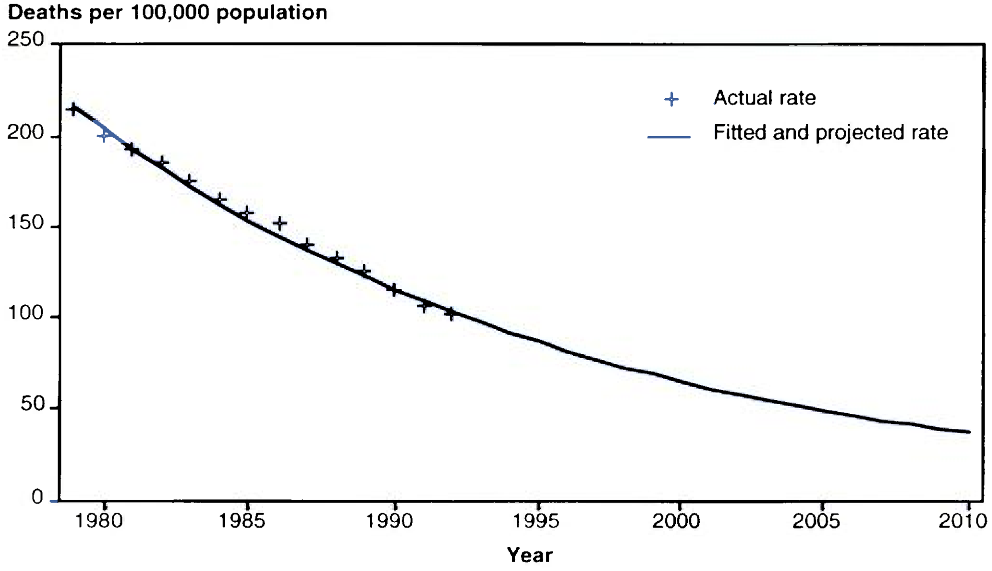
Such analyses can assist decision makers in selecting meaningful and attainable targets. More complex modelling can examine the relationship between different indicators and between indicators for different population subgroups. This can help decision makers arrive at a range of coherent and feasible targets.

The form of the target

The final target value can be expressed as either an absolute value or a percentage change. Nutbeam et al. (1993) use both formulations. The absolute target value is generally preferred because it is unambiguous, easier to monitor and generally has a greater impact on policy makers. However, if percentage reductions are used, care must be taken in their measurement. The inherent variability in most indicators means that simply looking at the difference between a baseline value and a single monitoring value may give a misleading idea of the indicator's rate of change. The change in an indicator must be measured over several years so that the effect of year-to-year chance variation can be removed from the estimate of underlying change.

Setting a target for coronary heart disease

The target for mortality from coronary heart disease will be expressed as an age-standardised number of deaths per 100,000 population. Nutbeam et al. (1993) have two target dates for coronary heart disease—the years 2000 and 2010. We will discuss a target for the year 2010.



Note: All death rates age-standardised to 1988 total Australian population.

Source: AIHW unpublished data

Figure 1.24: ***Coronary heart disease, males aged 30 to 64 years, actual, fitted and projected death rates per 100,000 population, 1979 to 2010***

Figure 1.24 shows the results of a trend analysis for our indicator. The analysis was done in three steps. First, the average annual percentage fall in the death rate for 1979 to 1992 was estimated. Then a fitted trend for 1979 to 1992, based on this average fall, was calculated from the model. Finally, a projected trend was calculated for 1993 to 2010 using the assumption that the estimated average annual fall in the death rate would continue to apply for this period. In addition, the 1992 death rate was tested to see if it was statistically significantly different from the fitted line.

This analysis represents the assumption that the average annual fall in mortality achieved over recent years can be maintained into the future. If this is the case, the projected age-standardised death rate by the year 2010 for males aged 30 to 64 years is 36.7 deaths per 100,000 population. The 1992 death rate was not statistically significantly different from the fitted line. Hence, there is no reason to believe that the average annual fall in mortality cannot be maintained at least for the immediate future.

The actual value of the target for our indicator is a matter for judgement by experts in coronary heart disease. However, in the light of this analysis, an appropriate target value should at least be less than 37 deaths per 100,000 population by the year 2010.

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2 Important causes of ill-health in Australia

2.1 Communicable diseases

Communicable diseases preventable by immunisation

Although the impact of diseases preventable by immunisation has been much reduced, the diseases have not been conquered.

Measles is a case in point. Between 1921 and 1925, it was responsible for the deaths of 508 Australian children up to 14 years, at a mortality rate of 5.7 per 100,000 per year. Twenty years later, between 1941 and 1945, it was responsible for the deaths of 307 children at a rate of 3.5 per 100,000 per year. Twenty years later again, between 1961 and 1965, by which time antibiotics were readily available, measles killed 90 children at a rate of 0.6 per 100,000 per year. Then, between 1981 and 1985, by which time immunisation had been available for many years, it killed 18 children at a rate of 0.1 per 100,000 per year. For this last period it is also possible to identify deaths from subacute sclerosing panencephalitis (SSPE), a delayed complication of measles; there were 22 additional deaths from this condition.

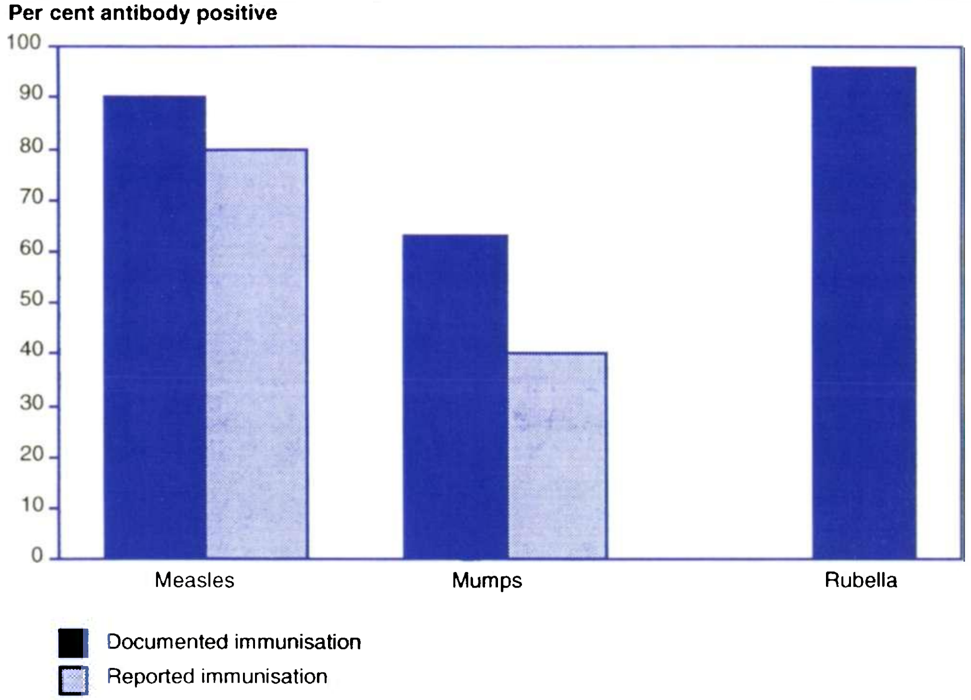
Since 1989, deaths from both measles and SSPE have become less frequent—there were only four measles and two SSPE deaths in children between 1989 and 1992. There were, however, 1,380 cases of measles notified in 1991, the first year the disease was notifiable in all States and Territories.

A high level of immunisation is important if measles is to be controlled. A survey of reported measles immunisation was conducted among children enrolling in kindergarten classes in the eastern Sydney area in 1989 (Ferson & Christie 1992). Information was collected for 2,230 children from an enrolment of 2,738 (81% of total).

The proportion reported as fully immunised with measles–mumps vaccine was 91%. This proportion was significantly lower among public school children than among those attending other schools. Among children attending public schools, those from English-speaking families were more likely to be reported as immunised than those from non-English-speaking families.

The 1989–90 National Health Survey similarly found that approximately 90% of children aged 1 to 6 years were reported as fully immunised against measles.

However, the reports were not necessarily correct. Causer et al. (1993) have found a higher prevalence of measles antibody in children in whom measles immunisation was documented than in children in whom immunisation was reported but could not be documented (Figure 2.1). Although the numbers in the latter group were small, the lower prevalence of antibody does cast doubt on unsupported parental reports of immunisation, and provides some justification for regarding these children as unimmunised for purposes of exclusion from schools and preschools during epidemics.



Source: Causer et al. 1993

Figure 2.1: ***Prevalence of immunity to measles, mumps and rubella in a sample of pre-school children with documented or reported immunisation***

The other infectious diseases of childhood also still cause deaths. Between 1980 and 1992 there were 14 deaths (all under one year) from pertussis (whooping cough). Lester & Nolan (1993) examined statistics of vaccine use, concluding that 89.3% of Victorian children received three injections in their primary immunisation (three injections of diphtheria–pertussis–tetanus vaccine are recommended). However, 4.6% of infants were receiving diphtheria–tetanus vaccine rather than a third dose of diphtheria–pertussis–tetanus vaccine, thus being inadequately vaccinated against pertussis.

Also between 1980 and 1992, there were 24 deaths from hepatitis B, 2 from mumps, and 119 from Haemophilus influenzae B meningitis. There were no deaths from rubella, although 620 cases of rubella were notified in 1991. Nor were there any deaths from diphtheria; the epidemic of 150 cases in the Northern Territory between 1985 and 1988 was of skin diphtheria.

Effective prevention can require more than promoting immunisation in those who will benefit by it. There can also be problems arising from immunisation of those who do not need it. MacIntyre, Carnie & Plant (1993) have reported that 47% of the influenza vaccine supply for Victoria in 1992 was administered to people at low risk. This figure is of concern, since vaccine supplies ran short in that year, and some at high risk were unable to be immunised.

Sexually transmitted diseases

Most information on sexually transmitted diseases, other than on HIV infection and AIDS which are considered separately below, comes from statistics of notifiable diseases.

Table S21 on page 235 gives national statistics of all notifiable diseases from 1987 to 1992. It shows that there were 2,908 notifications of gonococcal infection in 1992. Notifications of gonococcal infection decreased until 1990, but have increased by 52% since then. This apparent reversal of trend must be interpreted with care, as the introduction of laboratory notification in 1991 may have substantially increased the proportion of cases reported (Communicable Diseases Network—Australia 1993).

Most of the notifications of gonococcal infection related to sexually transmitted gonorrhoea, but there were 27 infections in infants in 1991, and some non-sexually transmitted infections. Sex of the patient was not always reported, but was available for 1,750 males and 720 females; this sex ratio may be because gonorrhoea often does not cause symptoms in females. The highest notification rates per 100,000 population were at 20 to 24 years in both sexes.

Notifications of syphilis, the next most frequently reported sexually transmitted disease, increased by 54% between 1990 and 1992. As with gonorrhoea, this may represent more complete notification, as laboratory notification of syphilis was introduced following a period of decline in cases notified. However, there was a very different sex ratio. In 1991 there were 1,052 infections known to have been in males and 962 in females. The highest infection rates were at 25 to 29 years in males and 15 to 19 years in females.

Chancroid, donovanosis, and lymphogranuloma venereum are not notifiable diseases in New South Wales, South Australia or Tasmania, and lymphogranuloma venereum is also not notifiable in Western Australia. There were 78 cases of donovanosis notified in 1992, five of chancroid and three of lymphogranuloma venereum. The last previous notifications of lymphogranuloma venereum had been in 1986.

Notifications of sexually transmitted diseases in each State and Territory in 1991 are shown in Table 2.1. Converting these numbers to notification rates per 100,000 population yields rates ranging from 441 in the Northern Territory to 3 in the Australian Capital Territory and in Tasmania. There is similar variation for syphilis, from 276 per 100,000 population in the Northern Territory to 2 in Victoria, the Australian Capital Territory and Tasmania. The ratio of syphilis infections to gonococcal infections does not vary greatly by State, and much of the apparent variation in incidence between States appears to reflect variation in the proportions of cases that are notified. There is thus great scope for improvement in these important statistical collections.

Table 2.1: *Number of cases of selected notifiable diseases, by State or Territory, 1992*

Disease	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Chancroid	nn	1	1	2	nn	nn	1	–	5
Donovanosis	nn	–	17	24	nn	nn	–	37	78
Gonococcal infection[a]	480	228	620	814	165	9	9	583	2,908
Lymphogranuloma venereum	nn	3	–	nn	nn	nn	–	–	3
Syphilis	891	39	687	316	92	–	11	659	2,695

nn Not notifiable

(a) Vic, Qld, SA and NT include gonococcal neonatal ophthalmia.

Source: Communicable Diseases Network Australia and New Zealand, National Notifiable Diseases Surveillance System, personal communication

AIDS

Previous issues of *Australia's health* have described how the AIDS epidemic is made up of sub-epidemics in largely separate population groups, and how, in those infected by blood transfusion, the sub-epidemic has already passed its peak. More recent data relating to these sub-epidemics are shown in Table S23, page 259.

It now appears that both the epidemic as a whole and the major sub-epidemic, in homosexual and bisexual men, may be at their peak. Figure 2.2 (page 82) shows the number of cases of AIDS by year of diagnosis. The number of cases notified in 1991 exceeds the number of cases notified in 1992, even after adjustment of the latter for late notification. The 451 diagnoses of AIDS between January and September 1993 notified before 31 December 1993 are 4.4% more than the 432 diagnoses of AIDS between January and September 1992 notified before 31 December 1992.

There were 178 diagnoses of newly acquired HIV infection in 1993 (Table 2.2), and this number has increased from 79 in 1991. The number of new infections that remain undiagnosed is necessarily unknown, but it is clear that there is no room for complacency over newly acquired infections.

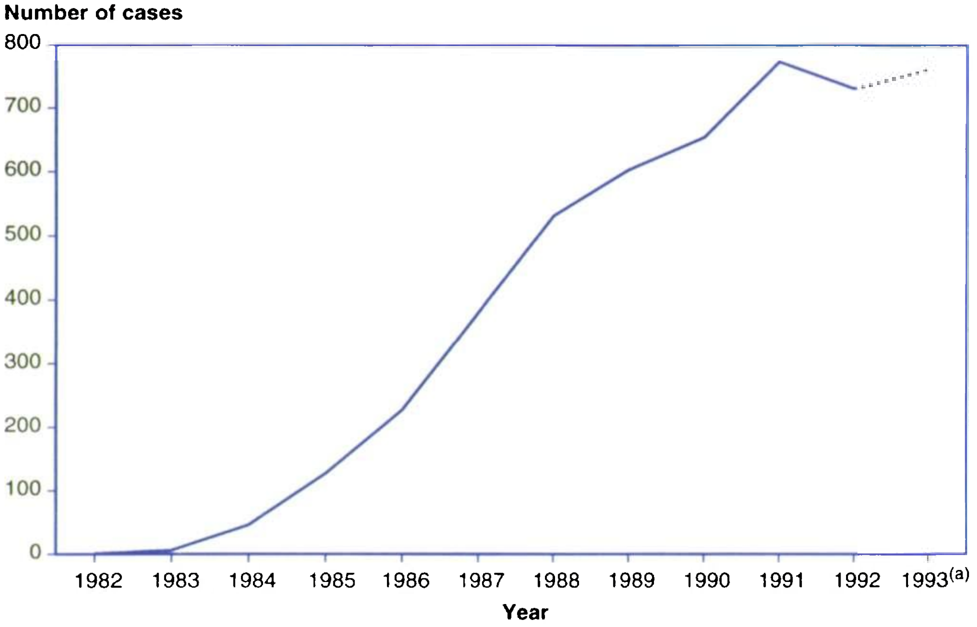
Table 2.2: *Newly diagnosed cases of HIV infection, by sex, 1991 to 1993*

	Newly acquired[a]		Other diagnosis		Total HIV diagnoses		
Year	Male	Female	Male	Female	Male	Female	Total[b]
1991	77	2	1,173	73	1,250	75	1,418
1992	140	8	957	84	1,097	92	1,206
1993	171	7	733	69	904	76	996

(a) Cases of newly acquired HIV infection were identified on the basis of a previous negative test within 12 months of the diagnosis of infection or the report of an HIV seroconversion illness.

(b) Total includes 6 people whose sex was reported as transsexual and 120 whose sex was not reported.

Source: *Source:* National Centre in HIV Epidemiology and Clinical Research unpublished data



(a) Projected number of cases if delays in notification were the same as in 1992.

Source: National Centre in HIV Epidemiology and Clinical Research

Figure 2.2: *AIDS cases by calendar year of diagnosis*

The impact of HIV infections including AIDS is approximately 40 times greater for men than for women. The indirect cost impact is even further biased towards men, reflecting both disease incidence and forgone earnings factors. The 20–39 years age group accounted for the largest share (43%) of direct costs, followed by the 40–49 years age group. Shares of indirect and of total costs were similarly distributed by age group.

The cost of AIDS

The importance attached to a disease depends on how importance is viewed and measured. Mortality, morbidity and cost indicators can give different impressions of the burden of suffering a disease imposes on the community. Table 2.3 provides some summary indicators of the burden of suffering associated with HIV infection including AIDS.

Only 0.31% of deaths are due to AIDS, and HIV infections including AIDS accounted for an only slightly higher proportion (0.47%) of total recurrent hospital expenditure in 1989–90. Direct costs for personal treatment in hospitals, medical services, pharmaceuticals, and community care were estimated at $54.1 million in 1989–90. Non-personal direct costs for prevention, research, screening, education and administration added a further $51.1 million in estimated health care costs.

Table 2.3: *AIDS / HIV, burden of suffering, 1989–90*

	Number	Cost ($m)	Per cent of total[a]
Mortality			
Deaths[b]	390		0.31
Potential years of life lost to age 75	11,056		
Morbidity and cost of health care			
Hospital admissions	7,765	46.5	0.47
Hospital bed-days	*35,951*		
Medical consultations	65,532	1.9	0.04
Pharmaceutical scripts	48,667	0.7	–
Community care		5.0	
Prevention, research, screening, education, administration		51.1	
Total direct costs		105.2	
Indirect costs			
Forgone earnings due to premature death		117.2	
Absenteeism		11.5	

(a) Per cent of total relevant expenditure 1989–90, except for deaths which is per cent of all deaths in 1989.

(b) Cause of death AIDS or toxoplasmosis or Pneumocystis carinii pneumonia. The number of deaths primarily due to HIV infection may therefore be underestimated.

Sources: AIHW unpublished data; Antioch et al. 1992

2.2 Cancer

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

Each year, approximately 190,000 new cancer cases are diagnosed in Australia. A large proportion of these, 135,000, are non-melanocytic skin cancers which, if treated early, are not life-threatening. The other new cancers attack other body systems, and most are potentially fatal. Cancer accounts for 27% of male deaths and 24% of female deaths, second only to circulatory disease deaths.

The registration of cancer is mandatory under legislation in each of the States and the Northern Territory, where the data are collated by cancer registries. The Australian Capital Territory operates under a voluntary reporting system to the New South Wales Registry, but is currently reviewing options for legislation.

Cancer incidence

The cancer registries collect clinical and demographic information about people with newly diagnosed cancers. This incidence information is collected from hospitals, pathologists, radiologists, cancer treatment centres and nursing homes. Further demographic information related to deaths from cancer is collected from Registrars of Births, Deaths and Marriages. By combining information from these sources, cancer registries are able to estimate State and Territory cancer incidence and mortality. The National Cancer Statistics Clearing House at the Australian Institute of Health and Welfare, in conjunction with the State and Territory cancer registries, further collates the information to produce national estimates of cancer incidence and mortality. These national estimates are available for 1982 to 1988 and provide the basis for the analysis that follows.

Excluding non-melanocytic skin cancers (NMSC), there were 30,511 new cancers in males and 26,490 new cancers in females in 1988, with age-standardised incidence rates of 414.5 per 100,000 males and 297.5 per 100,000 females. In the same year, there were 16,747 male deaths due to cancer at the age-standardised death rate of 234.7 per 100,000, and 12,652 female deaths due to cancer at the rate of 137.7 per 100,000. These age-standardised rates mean that men have a 39% higher risk of being diagnosed with cancer, and a 70% higher risk of dying of cancer than do women.

The risk of cancer is lowest in late childhood, and in adult life it increases with age. Figure 2.3 presents the age-specific incidence rates for all cancers. Males have the higher incidence beyond 55 years and females have higher incidence at 25 to 54 years. This reflects the fact that female-only cancers (of the cervix, uterus, ovary and breast) have an incidence almost three times that of the male-only cancers in this age range.

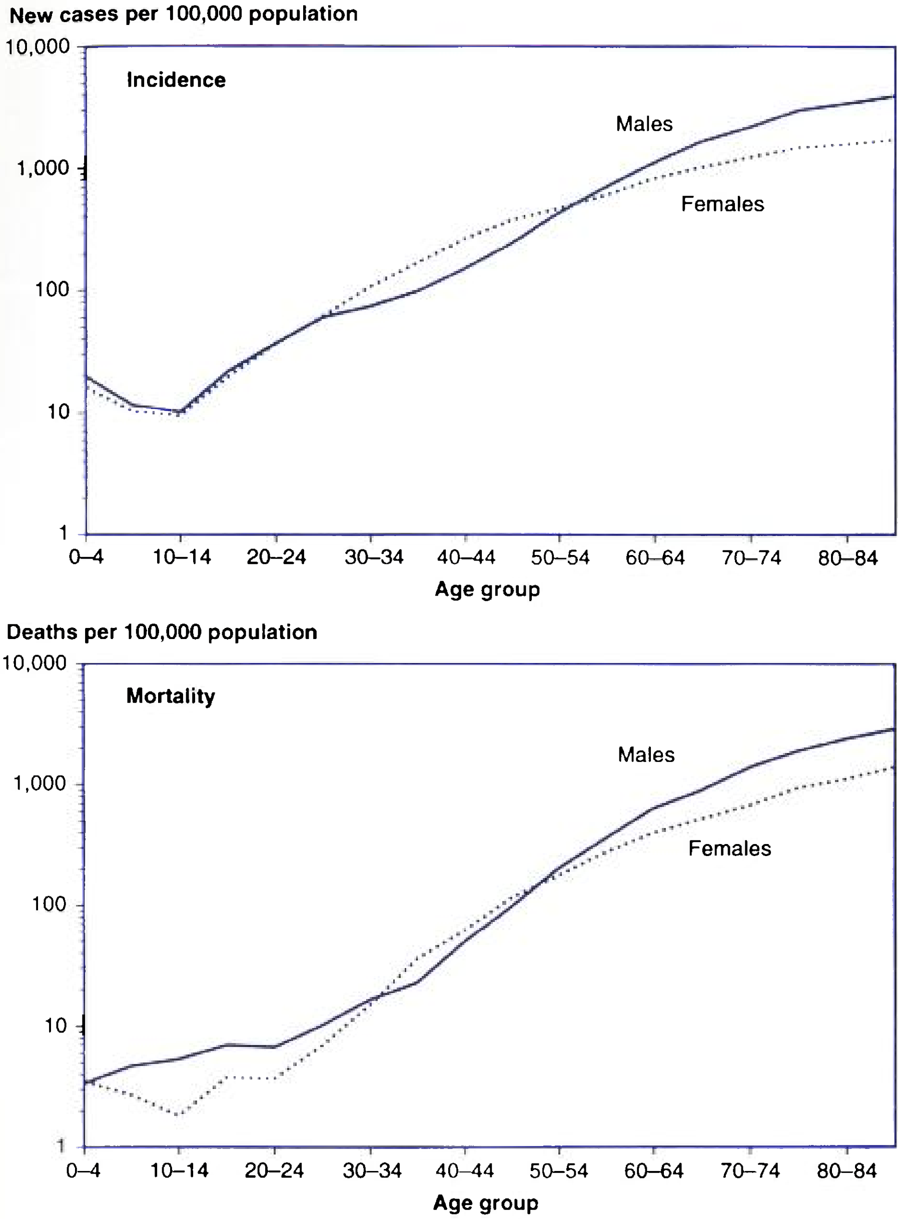
The most common cancers in Australia are the NMSC. Details of these cancers are not recorded by all cancer registries as most of them are not histologically confirmed, or are not reported. These skin cancers, almost all of which are basal cell and squamous cell carcinomas, are often self-detected and are usually removed in doctors' surgeries by simple excision, curettage, or cryosurgery. Giles, Marks & Foley (1988) estimated, using survey methods, that the national age-standardised treatment rate for NMSC was 823 cases per 100,000 per year. Over the age of 60 years, male NMSC rates were higher than female rates.

The incidence of the other most common cancers is presented in Figure 2.4 (page 86). Lung cancer in men and breast cancer in women account respectively for 15.8% and 24.8% of all cancers, and represent major focuses in public health campaigns.

Trends in incidence have varied from cancer to cancer. Between 1982 and 1988, the incidence among women of cancer of the breast and of melanoma showed significant increases, and of lung cancer a somewhat lesser increase. In men, incidence of cancer of the lung fell slightly, but cancer of the prostate and melanoma of the skin showed significant increases (Figure 2.5, page 87). Other changes were increases in incidence of cancer of the oesophagus and of the lip in women, and in non-Hodgkin's lymphoma in men; only a small proportion of the last represents non-Hodgkin's lymphoma due to HIV infection.

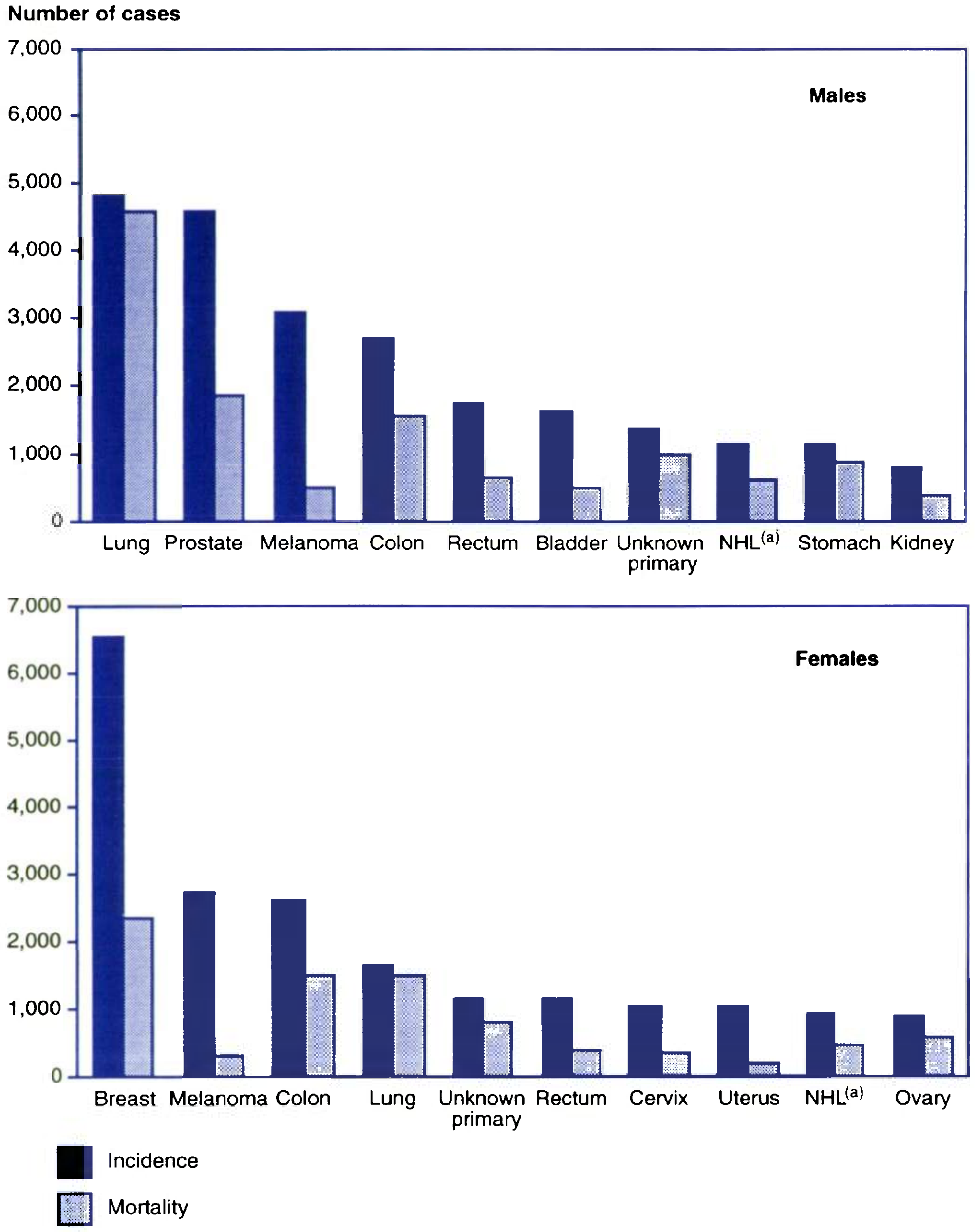
Mortality from cancer

In cancer death rates, a most alarming trend is the rapid rise since the 1960s in female lung cancer, where the age-standardised death rate rose from 5.7 per 100,000 in 1966 to 17.5 per 100,000 in 1992 (Figure 2.6, page 88), as a result of the increased cigarette consumption by women since the 1940s. There have been declines in lung cancer death rates in men (to 58.0 per 100,000 per year in 1992) but they remain three times those of women. The proportion of men smoking declined through the 1980s and into the 1990s and it is expected that this will reduce men's lung cancer death rates over the next decade. Smoking rates in women have also declined but at a slower rate, which may curb the increase in women's lung cancer death rates.



Source: Jelfs et al. 1994

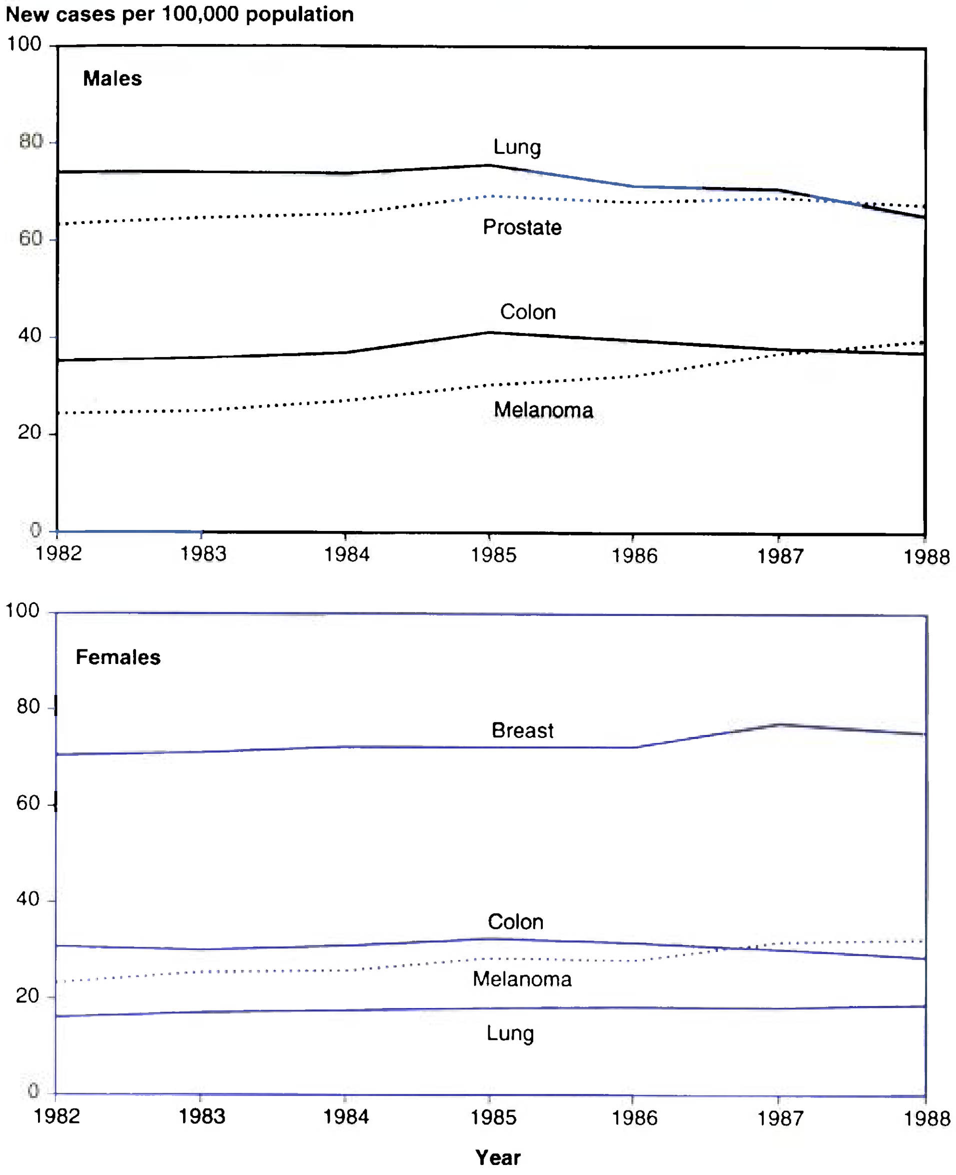
Figure 2.3: ***Malignant neoplasms (excluding non-melanocytic skin cancer), age-specific incidence and death rates by sex, 1988***



(a) Non-Hodgkin's lymphoma

Source: Jelfs et al. 1994

Figure 2.4: ***Leading cancers (excluding non-melanocytic skin cancer), incidence and mortality, by sex, 1988***

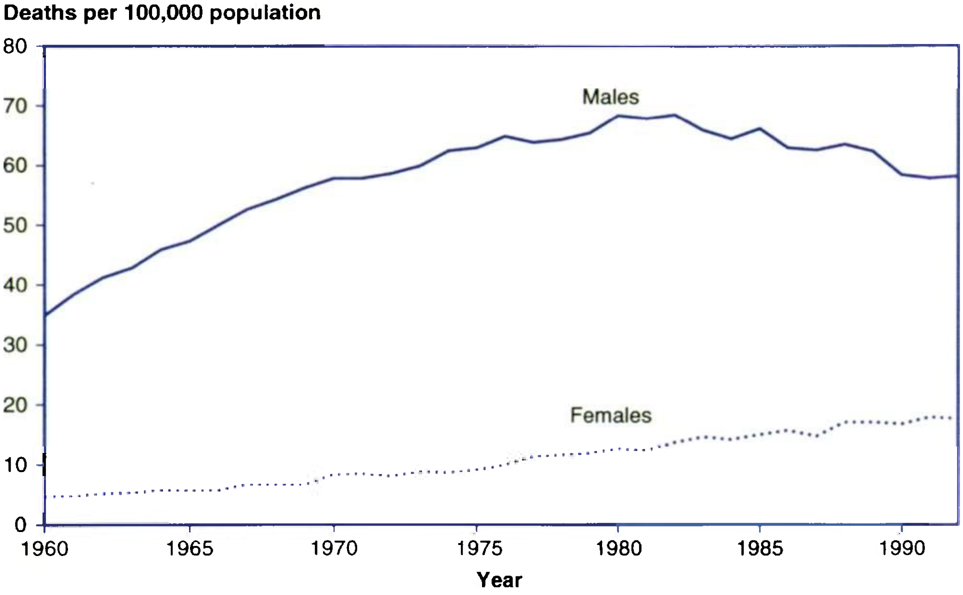


Note: Age-standardised to the 1988 Australian population.

Source: AIHW unpublished data

Figure 2.5: *Major cancers, age-standardised incidence rates, by sex, 1982 to 1988*

Cancers of the lung, breast, cervix, and testis, and melanoma are currently being made a priority in public health campaigns, such as in the national screening programs for breast and cervical cancer. Outcome targets for the year 2000, for example to reduce mortality and morbidity from cervical cancer by 30%, have been set. Related to these outcome targets is a series of risk factor targets, for example to reduce ultraviolet radiation exposure, which, if achieved, should reduce the impact of these cancers (in this case the incidence of melanoma). These and many other cancers represent a large cost to the community as well as to the individuals affected, as the management of cancer involves extensive treatment.



Note: Age-standardised to the 1988 Australian population.

Source: AIHW unpublished data

Figure 2.6: *Cancer of the lung, age-standardised death rates, by sex, 1960 to 1992*

Survival following cancer

Five-year relative survival ratios for cancer (these are the ratio of the proportion of cancer patients surviving five years and of the proportion of an age and sex matched population surviving five years) have generally improved in recent years. The South Australian Cancer Registry is at present the only Australian cancer registry to publish survival estimates. Its data indicate that the relative survival ratio for all cancers for males is 45%, and for females 57%. Of the most common cancers, for males, lung cancer has an 11% survival ratio, and for females, breast cancer has a much better outlook, at 75% relative survival ratio.

The South Australian Cancer Registry has noted significant improvements in survival from some cancers. For example, the five-year survival ratio for cancer of the cervix improved by 8% to 73% between cases diagnosed in 1977–82 and cases diagnosed in

1983–90; for prostate cancer, the improvement was by 7% to 67%; and for cancer of the oesophagus (one of the more lethal cancers), the improvement was by 8% to 15%.

Improved results of treatment for cancers of the cervix and uterus and for Hodgkin's disease have also been observed over the last ten years.

2.3 Cardiovascular disease

Mortality

Cardiovascular disease (CVD), which includes all diseases of the heart and the circulatory system, accounted for 54,912 deaths or 44.4% of deaths from all causes among Australians in 1992 (ABS 1993). Ischaemic heart disease (more commonly called coronary heart disease (CHD)) was the major cardiovascular cause of death, accounting for 25.5% of deaths from all causes. Cerebrovascular disease (stroke) accounted for 9.7% of all deaths and peripheral vascular disease for 2.7% of all deaths.

There were 31,482 CHD deaths registered in 1992, representing 57.3% of total CVD mortality. The age-specific CHD death rate for males was consistently higher than that for females with the largest relative differences occurring for the age groups 25–44 years and 45–54 years, where the male death rate was just over 4.5 times the female rate (Table 2.4).

Death from stroke represented 21.8% of deaths from CVD in 1992, and 74.0% of all deaths from stroke were in people aged 75 years and over.

Australia has experienced a great decline in mortality from CVD over recent decades. The decline in CHD mortality started during the late 1960s and the current annual decrease has been estimated at 3.2% in males and 2.1% in females (Bennett et al. 1992). Mortality from heart attacks (acute myocardial infarction), the major contributor to CHD mortality, is declining at an annual rate of 4.0% in men and 2.7% in women. Stroke mortality is currently declining at around 4.5% per year in both sexes.

Table 2.4: ***Cardiovascular disease mortality, age-specific rates by sex and age group, 1992 (per 1,000 population)***

Sex / Age group	Ischaemic (ICD 410-414)	Cerebrovascular (ICD 430-438)	Other CVD (ICD 390-405, 415-429, 440-459)	All CVD (ICD 390-459)
Men				
25–44	12	3	5	20
45–54	93	13	20	126
55–64	324	50	78	451
65–74	905	205	227	1,336
75 and over	2,776	1,038	985	4,798
Women				
25–44	3	3	3	8
45–54	20	14	10	44
55–64	106	37	40	183
65–74	401	136	132	668
75 and over	2,169	1,161	992	4,322

Source: ABS 1993

The declines in mortality rates are reflected in declines in potential years of life lost (PYLL). In 1971, heart disease (primarily CHD) among males accounted for 18.9% of PYLL between the ages of 0 and 65 compared with 13.9% in 1989 (Jain 1992). For females, it contributed 10.9% of PYLL in 1971 and 7.9% in 1989. Cerebrovascular disease among females accounted for 6.0% of PYLL in 1971 and 3.0% in 1989. d'Espaignet (1994) has noted that, of those who died from CHD in 1971, 43.0% of men and 31.0% of women were aged less than 70. By 1991 these proportions had reduced to 33.6% and 21.6% respectively. These reductions were greater than equivalent figures for all causes of mortality.

Declines in CHD deaths have been attributed mainly to declines in incident cases which in turn have resulted from changes in the risk factor status of the population (Manson et al. 1992; Beaglehole 1990; Blackburn 1989; Rose 1989; Martin et al. 1989). Improved medical care and treatment has also contributed to reduced CHD mortality (Beaglehole et al. 1989; Martin et al. 1989). Declines in stroke mortality have also been attributed to a combination of primary and secondary prevention (Bonita & Beaglehole 1993; McGovern et al. 1992; Bonita, Stewart & Beaglehole 1990).

Table 2.5: ***Cardiovascular disease mortality, age-standardised rates***$^{(a)}$ ***by sex and selected countries, latest available year (per 1,000 population)***

		Males			Females		
Country	**Year**	**Cardio-vascular**	**Ischaemic**	**Cerebro-vascular**	**Cardio-vascular**	**Ischaemic**	**Cerebro-vascular**
Australia	**1992**	**227**	**144**	**40**	**141**	**74**	**35**
Canada	1990	218	139	33	**120**	65	26
Chile	1989	212	85	68	**144**	49	50
France	1990	161	57	38	**90**	23	27
Germany	1990	307	140	58	**186**	62	45
Greece	1990	253	90	75	**182**	35	74
Iceland	1991	244	161	47	**121**	67	32
Ireland	1990	337	214	53	**186**	93	46
Israel	1989	236	128	43	**170**	73	40
Italy	1989	230	88	64	**143**	37	47
Japan	1991	160	29	60	**103**	16	42
Malta	1991	293	163	67	**223**	105	60
Netherlands	1990	239	123	44	**125**	48	35
New Zealand	1989	292	195	50	**165**	89	45
Norway	1990	283	175	54	**144**	67	43
Poland	1991	499	142	57	**280**	44	41
Singapore	1990	262	147	76	**180**	84	66
Spain	1989	206	68	59	**141**	27	48
Sweden	1989	267	165	42	**142**	69	35
Switzerland	1991	215	99	34	**120**	38	27
UK	1991	286	191	55	**164**	87	48
USA	1989	266	151	32	**158**	77	28
Yugoslavia	1990	375	86	99	**274**	37	81

(a) Age-standardised to World Standard Population.

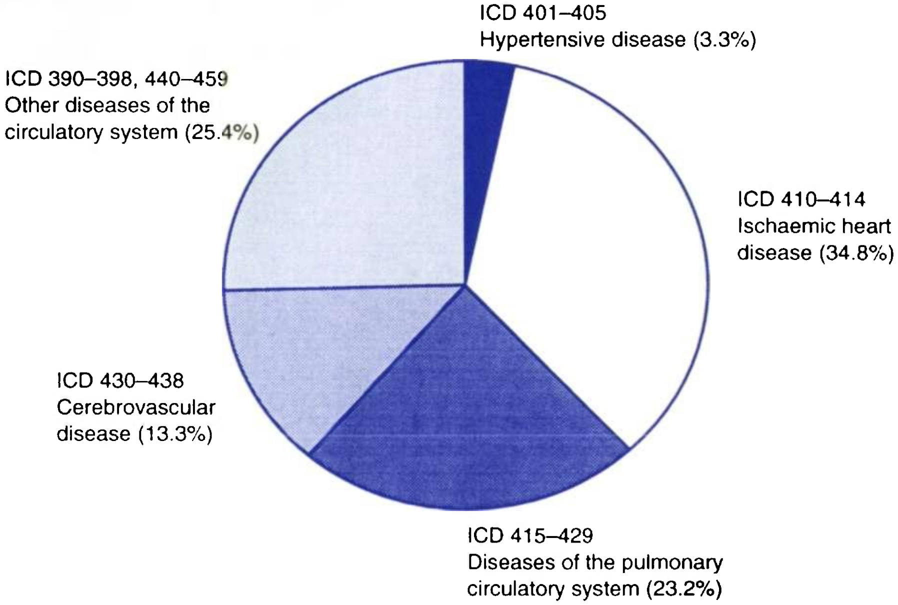
Source: World Health Organization 1993; AIHW unpublished data

Despite the declines in CVD mortality, Australia still compares unfavourably with many other countries. Australia's 1992 age-standardised death rates are compared with the latest available from selected other countries in Table 2.5. Australian CVD death rates are towards the lowest of those shown, but even so are 41% higher (males) and 57% higher (females) than for France. Australia's relative position is different for the two major components of CVD. Australian ischaemic heart disease death rates are towards the highest of those shown in Table 2.5, and nearly 5 times greater (males), and over 4 times greater (females) than in Japan. Australian stroke death rates are towards the lowest of those shown, but those in Canada and the United States were approximately 20% lower for both sexes.

Morbidity

Hospital morbidity data provide a measure of CVD morbidity based on separations from hospital. In 1989–90, there were 3,410,200 separations (220 per 1,000 population) from acute hospitals (Gillett, Liu & Solon 1993). CVD was the principal diagnosis for 8% of these separations. CHD was the principal diagnosis for 34.8% of the CVD separations followed by diseases of the pulmonary circulatory system (23.2%) and stroke (13.3%) (Figure 2.7).

Another source of morbidity data is provided by the regular series of population health surveys conducted by the Australian Bureau of Statistics. From the 1989–90 National Health Survey it is estimated that over 2 million people or 13.0% of the population had a recent and/or a long-term cardiovascular condition (ABS 1991). Hypertension and heart disease were the most commonly reported cardiovascular conditions.



Source: Gillett, Liu & Solon 1993

Figure 2.7: *Distribution of estimated CVD separations from acute hospitals, 1989–90*

The prevalence of each cardiovascular condition increased rapidly with age (Figure 2.8, page 93). Men had a higher prevalence of heart disease than women for most age groups. Men 55 years and over had a higher prevalence of cerebrovascular disease than women, and women 45 years and over had a higher prevalence of hypertension and ill-defined heart conditions than men. If all cardiovascular conditions are considered, women have a higher prevalence than men in all age groups except 35 to 44 years (Table 2.6).

Table 2.6: *Persons with cardiovascular conditions,*[a] *by age group and sex, 1989–90 ('000 persons)*

Sex / Type of condition	0–24	25–34	35–44	45–54	55–64	65–74	75 and over	All ages
Males								
Hypertension	6.0	24.7	69.7	118.7	176.8	181.7	70.0	647.6
Heart disease	8.0	3.4	10.7	24.0	68.6	78.7	46.9	240.4
Atherosclerosis	–	0.4	0.9	1.8	7.9	7.1	5.6	23.7
Cerebrovascular disease[b]	0.7	0.3	2.2	2.3	11.7	19.6	12.2	49.0
Other circulatory	5.3	4.1	7.1	14.3	33.7	40.0	24.2	128.6
Ill-defined	19.1	4.4	11.5	11.9	17.7	26.9	26.0	117.4
All cardiovascular[c]	38.4	36.2	95.6	153.2	248.7	262.1	136.4	970.6
Females								
Hypertension	10.8	22.9	60.1	135.8	212.4	265.8	181.9	889.7
Heart disease	6.5	5.3	7.2	13.9	31.9	72.4	72.7	209.8
Atherosclerosis	0.1	–	–	2.0	5.0	9.0	6.1	22.1
Cerebrovascular disease[b]	1.4	1.8	2.0	3.2	6.0	12.2	15.4	42.1
Other circulatory	8.5	14.0	12.5	15.3	28.7	39.4	32.8	151.3
Ill-defined	22.9	21.5	11.2	15.7	20.9	33.3	43.5	169.1
All cardiovascular[c]	48.1	61.8	86.8	170.4	259.4	342.6	273.2	1,242.3

(a) Reported as a recent and/or long-term condition.

(b) Includes after-effects of stroke.

(c) Each person may have reported more than one type of condition and therefore components do not add to totals.

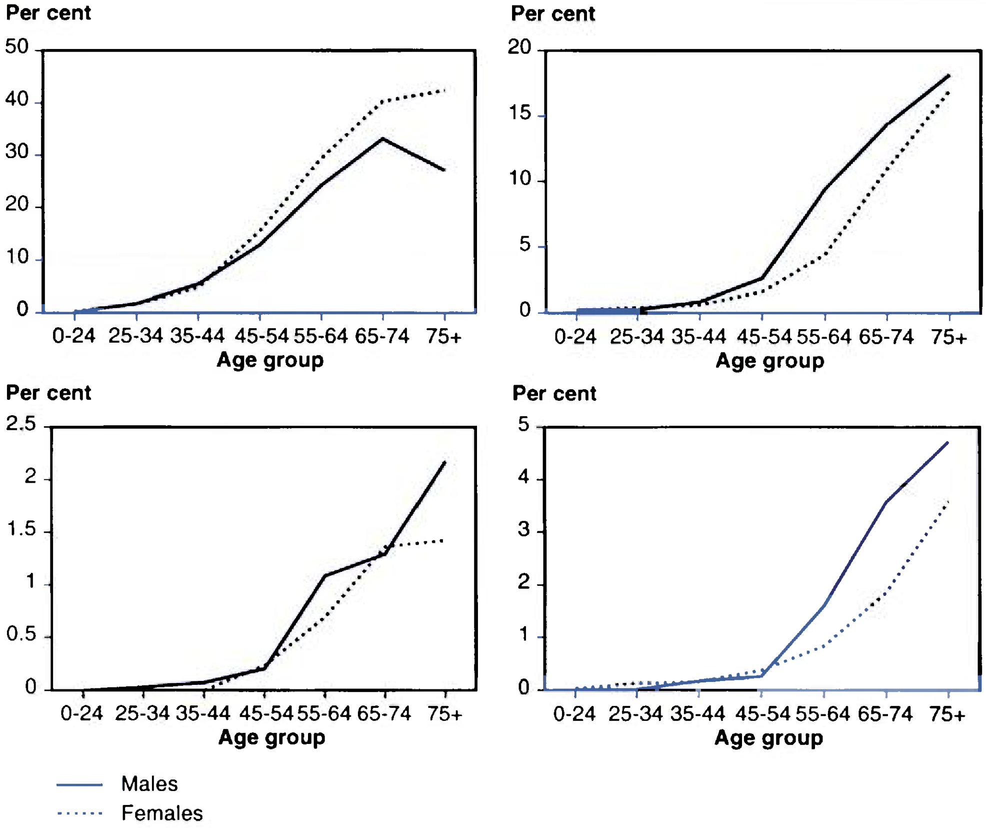
Source: AIHW unpublished data, derived from ABS 1989–90 National Health Survey

Detailed age-standardised analysis of hypertension as a chronic condition has used data from the 1989–90 National Health Survey (National Health Strategy 1992b). Low-income women are 30.7% more likely to report hypertension than high-income women. Both men and women with a low level of education are more likely to report hypertension (26.6% and 52.0% respectively) than men and women with a high level of education. Similarly, men and women who are not in the workforce have a significantly higher prevalence of reported hypertension (69.7% and 24.1% respectively) than men and women who are employed. Men and women born in the United Kingdom and Ireland are 26.2% and 21.7%, respectively, less likely to report hypertension than their Australian-born counterparts.

Box 2.1: Cardiovascular disease as defined in the 1989–90 National Health Survey

Respondents in this survey were regarded as having cardiovascular disease if they reported any of the following conditions (ABS 1991):

- *hypertension*
- *heart disease (including coronary heart disease, heart attack, coronary thrombosis, angina and leaking valve)*
- *atherosclerosis*
- *cerebrovascular disease*
- *other circulatory diseases (including thrombosis)*
- *ill-defined heart conditions (such as irregular heartbeat and palpitations).*



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

Figure 2.8: ***Reported recent and/or long-term cardiovascular conditions, proportions by age group and sex, 1989–90***

2.4 Dental disease

Changes in oral health of Australian children

There has been a marked reduction in caries experience in Australian children since national records in the School Dental Service began in 1977. The dift and dmft (see Box 2.2) of children aged 6 years have decreased substantially since then. Figure 2.9 shows trends in the components of the indexes.

In 1977, there was a higher level of active decay than of restorations. The prevalence of active decay diminished rapidly from 1977 through to the early 1980s, then slowed, but because of changes to the collection and assessment methods used in the Survey, it is not yet possible to say whether the declines have since resumed. Up to 1987 the prevalence of active decay decreased by 40%, and the ratio of decayed to filled teeth fell from 2:1 to 1.1:1. This is a substantial improvement, with reductions in both disease and unmet need for treatment.

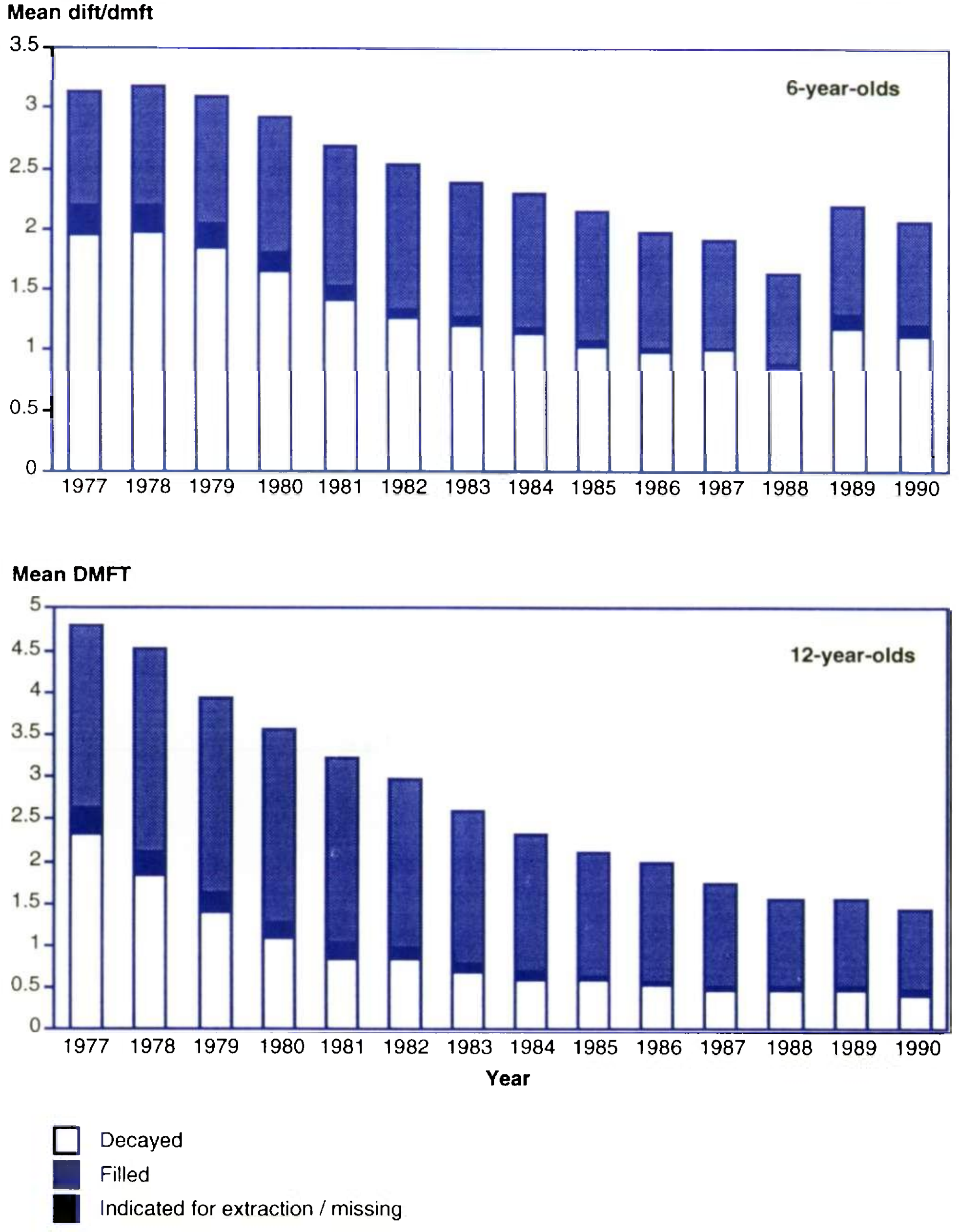
Box 2.2: Measurement of oral health in children

Oral health in children is most commonly assessed by their dental caries (decay) experience. For the Child Dental Health Survey data for 1977 to 1988, the index of caries for primary teeth consists of the number of decayed teeth (d), the number of teeth indicated for extraction due to caries (i), and the number of restored or filled teeth (f). For the more recent data, the index of caries consists of the number of decayed teeth (d), the number missing due to caries (m), and the number of restored or filled teeth (f). Both sets of numbers can be summed to produce scores, the 'decayed, indicated for extraction, or filled primary teeth' score (dift), and the 'decayed, missing or filled primary teeth' score (dmft).

The 'decayed, missing or filled permanent teeth' score (DMFT) for permanent teeth is similar to the dmft for primary teeth.

Caries experience in permanent teeth among 12-year-old Australian children as measured by DMFT scores (see Box 2.2) has declined by approximately 46% since 1977, although in recent years the rate of decline has slowed, because of the limited scope for further improvement in those areas where children have very few caries (Figure 2.9). There was a rapid decline in the level of decayed teeth during the early 1980s as unmet need for treatment was satisfied. Projection of the present downward trend suggests that the dental health target for the year 2000, of a mean DMFT of 1.0 for 12-year-old children, should be achieved.

The decline in caries experience in children is partly attributable to increased use of preventive practices and treatment strategies within both community dental practice and the School Dental Services. It is also due to the increasingly extensive application of fluorides in several forms, including water fluoridation, fluoridated toothpastes, direct applications to the teeth and dietary supplements (NHMRC 1991).



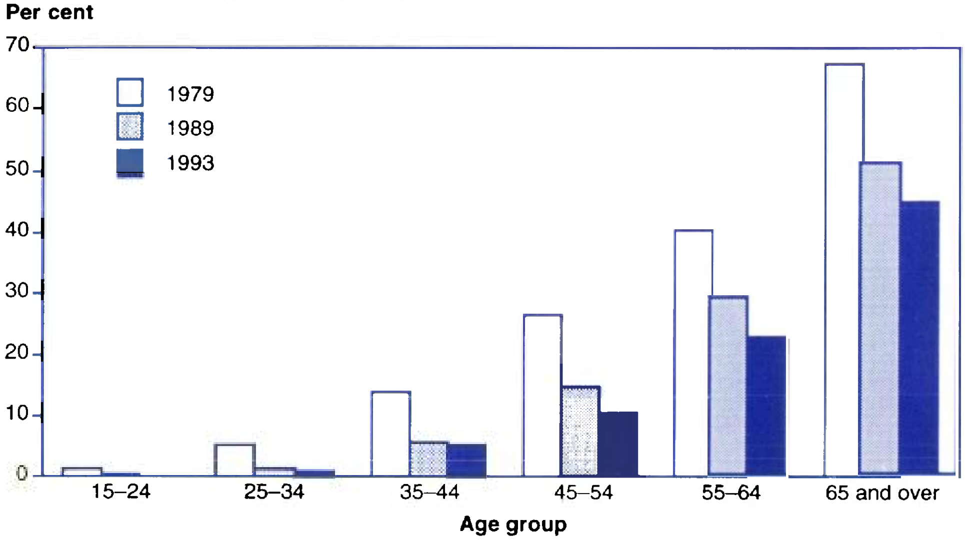
Source: AIHW Dental Statistics and Research Unit

Figure 2.9: *Caries experience in 6- and 12-year-old children, 1977 to 1990*

Changes in oral health of Australian adults

The loss of all natural teeth, or edentulism, is the end point of dental disease, and in a public health sense is a measure of dental mortality. Edentulism, therefore, represents the final failure of preventive and restorative care.

Figure 2.10 gives data of interview-reported edentulism from two surveys conducted by the ABS in 1979 and 1989–90, and from a survey conducted by the Dental Statistics and Research Unit in 1992–93. It shows that the prevalence of edentulism is generally very low in people aged less than 35 years, but rises steeply across age groups.



Source: AIHW Dental Statistics and Research Unit

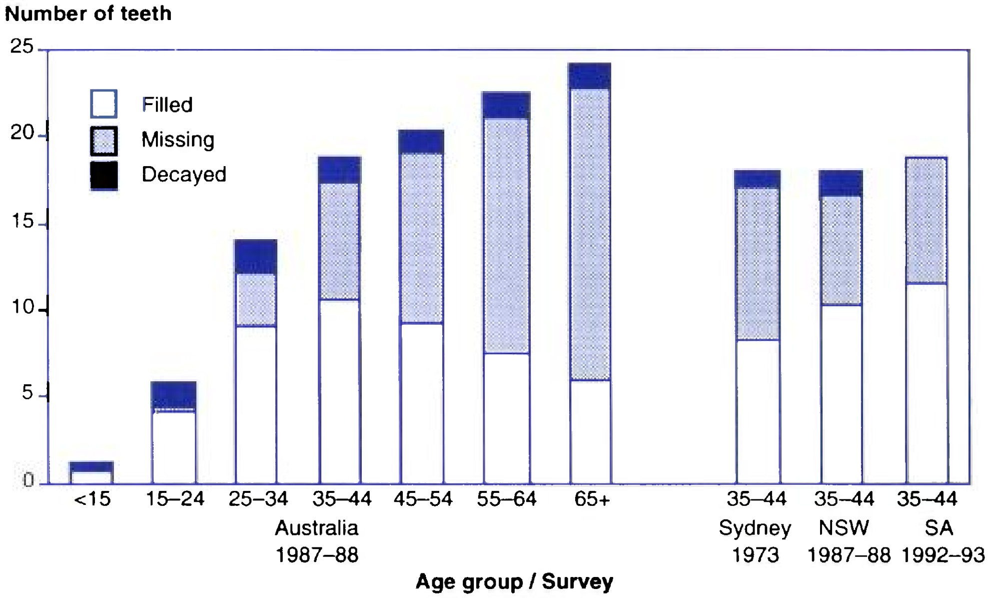
Figure 2.10: *Prevalence of edentulism by age group, 1979, 1989 and 1993*

Prevalence is also decreasing over time. The changes are substantial. For instance, 67.7% of people aged 65 years and over were edentulous in 1979, but only 44.4% in 1992–93. In all age groups to 64 years, the prevalence of edentulism more than halved over 14 years. The prevalence for 35–44-year-olds decreased from 14.0% to 5.4%, a reduction of 62%. The prevalence of 5.4% is better than the Health for All target for the year 2000, which was set at 7.0%.

This trend in the reduction of edentulism should continue into future decades, as present younger age groups continue to maintain their natural dentition far more successfully than those born in earlier years.

The trend in edentulism also correlates well with the increasing percentages of adults visiting a dentist within the last 12 months. The increasing number with natural teeth leads to an increasing number using dental services. This use in turn will increase the number retaining their teeth.

Figure 2.11 presents DMFT data from various Australian studies. Among young adults in the 1987–88 National Oral Health Survey (DHHLGCS 1993), caries experience was predominantly manifest as filled teeth. Missing teeth are dominant from 45 years, reflecting both the accumulation of disease and past patterns of care. Untreated decayed teeth, by contrast, show minimal variation across adult age groups.



Sources: AIHW Dental Statistics and Research Unit, DHHLGCS 1993

Figure 2.11: ***Caries experience in Australian adults, by age group, various surveys***

Data for people aged 35 to 44 years are shown on the right-hand side of Figure 2.11 for three time periods, 1973, 1987–88, and 1992–93. Comparison of these three periods indicates that the overall prevalence of caries may not have changed substantially over time. However, there has been a major improvement in oral health, with a reduction in the number of teeth lost to caries, and a corresponding increase in the number of filled teeth.

There is also evidence that young adults' needs for treatment are being met. However, it is possible that some of the apparent decrease in prevalence of active decay between 1987–88 and 1992–93 may be due to differences in study methods and differences between study locations.

2.5 Perinatal health

Birthweight

A key indicator of the health of babies born in Australia is the proportion having a birthweight of less than 2,500 grams. These low-birthweight infants have a greater risk of dying, of requiring a longer period of hospitalisation after birth, and of developing significant disabilities or handicaps. In 1991, there were 15,794 infants of low birthweight, a rate of 6.2%. Low birthweight is more common in the Northern Territory due to the relatively high proportion of Aboriginal births. The birthweight distribution is remarkably similar in the other States.

Type of delivery

Obstetric intervention may be needed if complications arise during pregnancy or labour, although there is debate about the optimal rate of intervention. Caesarean birth rates have increased markedly in the last few decades (National Perinatal Statistics Unit 1993a). In 1990, the national caesarean birth rate was 17.5%, ranging from 14.7% in Tasmania to 21.4% in South Australia (Table 2.7). There was also considerable variation in the rates of forceps deliveries and the use of vacuum extraction.

Table 2.7: *Type of delivery, States and Territories, 1990*

Confinements / Type of delivery	NSW	Vic	Qld[a]	WA	SA	Tas	ACT	NT	Australia
					(Number)				
Total confinements	86,545	66,000	44,479	25,637	19,687	7,004	4,735	3,349	257,436
					(Per cent)				
Spontaneous vertex	70.2	68.6	67.6	64.0	62.7	70.0	64.3	74.6	68.1
Forceps	10.3	12.3	9.2	8.6	12.7	12.7	13.6	6.0	10.7
Vaginal breech	1.3	1.3	1.2	0.8	1.0	1.3	1.2	1.4	1.2
Caesarean section	16.0	16.7	19.3	18.8	21.4	14.7	18.9	16.6	17.5
Vacuum extraction	1.7	1.1	2.4	7.8	2.2	0.5	2.0	1.3	2.3
Other / unknown	0.4	–	0.2	–	–	0.7	–	–	0.2

(a) Provisional data

Source: AIHW National Perinatal Statistics Unit unpublished data

Some States were able to provide information on caesarean birth rates according to whether the woman was a private or public patient (Table 2.8). The differential was greatest in Queensland where the caesarean rate was 55% higher in private than in public patients.

Congenital malformations

All States and Territories notify the birth of foetuses and infants with major congenital malformations to a national monitoring system (National Perinatal Statistics Unit 1993b). Malformations can be grouped into the main anatomical systems, based on the International Classification of Diseases (Table 2.9), or can be tabulated individually (Table 2.10). The most frequently notified groups of malformations in 1991 were of the musculoskeletal system, malformations of the heart and circulatory system, genital malformations, and chromosomal abnormalities. The specific malformations accounting for these high rates were respectively congenital dislocation of the hip, ventricular septal defect (hole between chambers of the heart), hypospadias (incomplete development of the underside of the penis), and Down's syndrome. Another relatively common malformation was cleft lip and palate.

Table 2.8: *Caesarean sections, by health insurance status, selected States and Territories, 1990*

	NSW	Qld[(a)]	WA	Tas	ACT
			(Number)		
Caesarean sections					
Private	7,747	4,499	2,491	587	558
Public	5,622	4,094	2,337	446	316
Total[(b)]	13,869	8,593	4,828	1,033	874
All confinements					
Private	41,207	18,357	11,280	3,462	2,848
Public	41,791	25,960	14,357	3,541	1,835
Total[(b)]	86,545	44,479	25,637	7,004	4,735
			(Per cent)		
Caesarean section rate					
Private	18.8	24.5	22.1	17.0	19.6
Public	13.5	15.8	16.3	12.6	17.2
Total[(b)]	16.0	19.3	18.8	14.7	18.5

(a) Provisional data

(b) Totals include confinements for which patient classification was not stated.

Source: AIHW National Perinatal Statistics Unit 1993a

Table 2.9: *Major congenital malformations, by anatomical system, Australia, 1991*

ICD–9 code	Anatomical system	Number	Rate per 10,000 births
740, 741, 742	Nervous system	404	15.6
743	Eye	105	4.1
744	Ear, face and neck	49	1.9
745, 746	Heart	807	31.2
747	Circulatory system	367	14.2
748	Respiratory system	155	6.0
749	Cleft palate / lip	367	14.2
750, 751	Digestive system	330	12.8
752	Genital organ	764	29.5
753	Urinary system	472	18.2
755	Limbs	431	16.7
754, 756	Other musculoskeletal	1,162	44.9
757	Integument	34	1.3
758	Chromosomal	586	22.6
759	Other and unspecified	120	4.6
740–759	**All fetuses and infants**	**4,587**	**177.3**

Source: AIHW National Perinatal Statistics Unit 1993b

Table 2.10: *Selected congenital malformations, Australia, 1991*

ICD–9 code	Congenital malformation	Number	Rate per 10,000 births
740	Anencephalus	54	2.1
741	Spina bifida	146	5.6
742.3	Hydrocephalus	89	3.4
745.1	Transposition of great vessels	88	3.4
745.4	Ventricular septal defect	416	16.1
749	Cleft lip and / or cleft palate	367	14.2
750.3	Tracheo–oesophageal fistula, oesophageal atresia and stenosis	78	3.0
751.2	Atresia and stenosis of large intestine, rectum and anus	87	3.4
752.6	Hypospadias	593	22.9
753.0	Renal agenesis and dysgenesis	108	4.2
754.3	Congenital dislocation of hip	627	24.2
756.6	Diaphragmatic hernia	98	3.8
758.0	Down's syndrome	332	12.8

Source: AIHW National Perinatal Statistics Unit 1993b

2.6 Transport-related injury

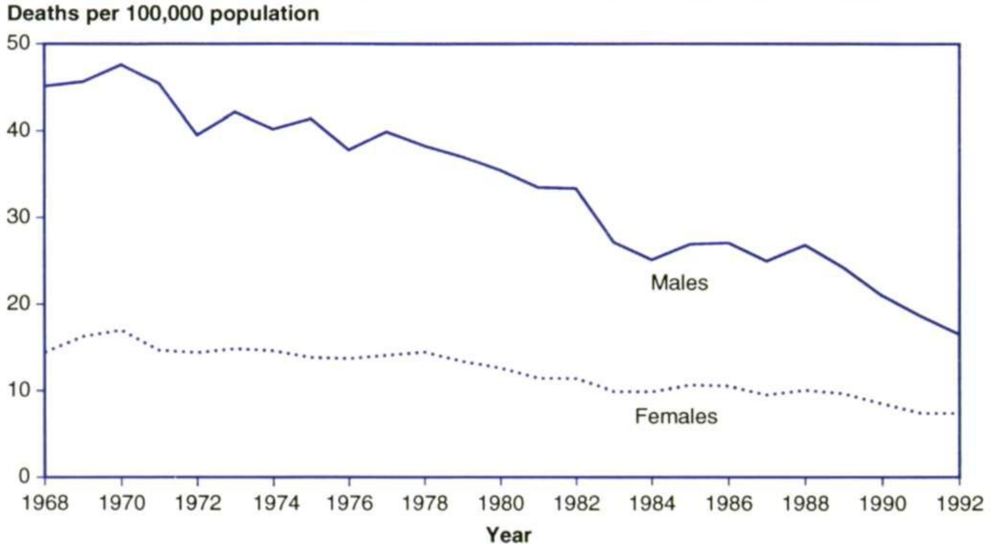
Deaths due to transport injury are dominated by road injury deaths (Table 2.11). The problem of transport-related injury is thus overwhelmingly a problem of road transport. The Bureau of Transport and Communications Economics (1992) showed that 94% of the total cost of transport crashes in Australia is due to road crashes. The direct and indirect costs of road crashes in Australia now amount to more than $6,000 million annually. In the next decade one in every ten Australian families will be directly affected by a road death or serious injury (Federal Office of Road Safety 1992).

Table 2.11: *Transport fatalities, 1992*

	Males		Females	
	Number	Per cent	Number	Per cent
Rail	43	2.6	18	2.5
Road	1,492	88.9	680	95.4
Air	72	4.3	8	1.1
Water	71	4.2	7	1.0
Total	**1,678**	**100.0**	**713**	**100.0**

Source: ABS unpublished data

Trends in road deaths since 1968 are presented in Figure 2.12. Deaths have declined substantially, especially from 1988 to 1992. Using time series modelling for the period 1981 to 1991, Pettitt, Haynes & Low Choy (1992) showed that economic activity affects crash numbers significantly. They concluded that a substantial proportion of this recent decline in fatal crashes was due to the recession. They predicted that a return to the economic conditions typical of 1989 would result in a continued downward trend in fatal crashes, although this would be less pronounced than during the recession. In fact, preliminary data for 1993 suggested that the number of fatal crashes would be just below that in 1992.



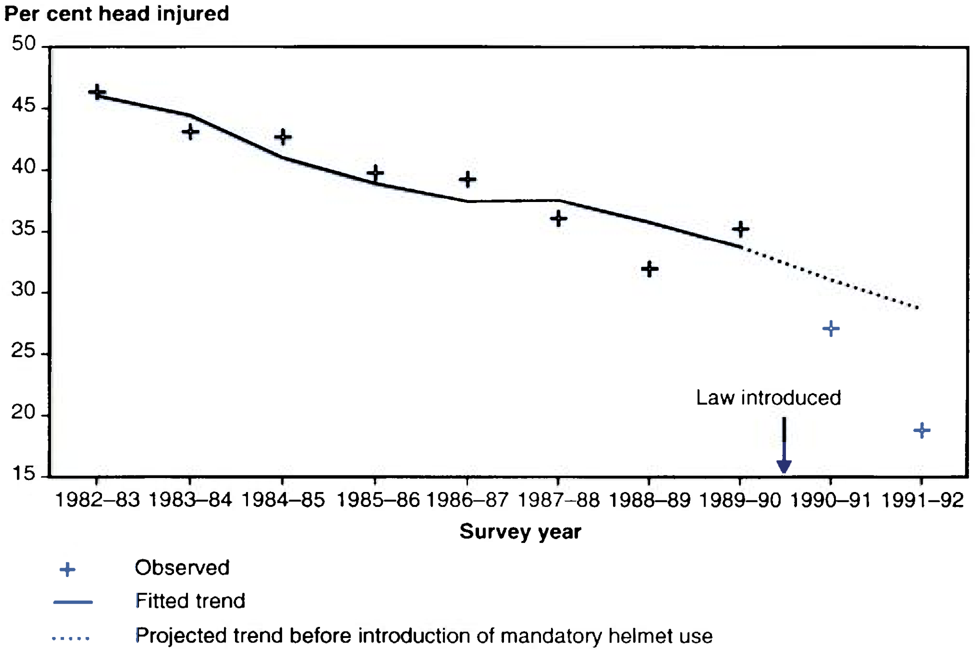
Source: O'Connor 1993

Figure 2.12: ***Motor vehicle traffic accident deaths, age-standardised rates by sex, 1968 to 1992***

Road crashes in Australia account for more years of life lost during the working age span than do all forms of heart disease, and over half the loss through all cancers (Ginpil, Schneider & Stone 1992). The significance of road injury as a public health problem is represented not only in statistics on lives lost and economic costs, but also in widespread effects on the quality of life, which may be dramatically reduced, of the survivors and their families (Oxley & Fildes 1993). When it is considered that road injury affects a much younger age group than do heart disease and cancer, the social impact of road crashes is particularly disturbing.

Public health campaigns against drink driving and legislation for random breath testing (Cameron & Strang 1980) provide a notable example of successful prevention. Figure 2.13 (page 102) relates to another successful countermeasure. It demonstrates a reduction in head injury among pedal cyclists as helmet-wearing rates increased, and particularly following legislation requiring helmet wearing (Finch et al. 1993).

A major priority of the National Injury Surveillance Unit Road Injury Information Program has been to create a National Road Injury Database using hospital data. A recent report (O'Connor 1993) from this database presents more comprehensive data than has been available before on the incidence and severity of road injuries in Australia. The following sections are drawn primarily from that report; the references to hospital admissions for injury are conclusions from statistics of hospital separations, as described in Box 4.2 on page 160.



Note: Head injuries among pedal cyclists killed or admitted to hospital. Based on claims to the Transport Accident Commission.

Source: Finch et al. 1993

Figure 2.13: ***Pedal cyclist head injuries before and after the introduction of mandatory helmet use, Victoria, 1982–83 to 1991–92***

Age

Hospital admission rates peak at 15 to 19 years, whereas fatalities peak at 20 to 24 years. Both rates decrease progressively through middle age with a slight increase for elderly road users (Table 2.12).

The ratio of the death rate to the hospital admission rate provides an indication of the case fatality. This ratio is highest in the elderly; there are 10 deaths for every 100 hospital admissions for road injury of persons aged 70 and over. The ratio is lowest at 5 to 14 years, where there are 2 deaths for every 100 hospital admissions.

Road user type

Vehicle occupants constitute 45% of admissions and 65% of fatalities. Pedestrians also make up a lesser proportion of admissions than fatalities (12% of admissions and 18% of fatalities). Cyclists, who account for 16% of admissions, constitute only 4% of fatalities. Motorcyclists constitute 13% of admissions and 12% of fatalities.

Table 2.12: *Road injury fatality and hospital separation rates, by age group, 1990*

	Fatalities		Hospital separations	
Age group	Rate per 100,000	% change 1988 to 1990[a]	Rate per 100,000	% change 1988 to 1990[a]
0–4	4	−17.5	92	−15.4
5–14	5	−8.6	232	−6.9
15–19	24	−21.1	518	−14.0
20–24	28	−24.0	452	−15.0
25–29	17	−27.4	296	−13.4
30–39	11	−17.8	196	−7.6
40–49	9	−10.0	148	−9.3
50–59	9	−28.6	148	−11.5
60–69	12	−9.8	137	−14.1
70 and over	18	−21.0	183	−10.9
All ages	**13**	**−19.8**	**232**	**−11.6**

(a) Per cent change in number of cases between 1988 and 1990.

Source: O'Connor 1993

Variations in fatalities by age group and road user type are presented in Table 2.13. Road users aged 0 to 14 years die primarily as passengers in motor vehicles, as pedestrians and as pedal cyclists. Those aged 15 to 24 years die primarily as drivers and passengers in motor vehicles and as motor cyclists. Road users aged 70 and over are the only adult group to die more frequently as pedestrians than as drivers.

Table 2.13: *Road injury fatalities, by road user type and age group, 1990*

	Road user type						
Age group	Driver	Passenger in motor vehicle	Motor cycle rider	Pedal cyclist	Pedestrian	Unknown / Other	Total
0–4	–	25	–	2	16	4	47
5–14	1	44	2	23	56	2	128
15–19	122	102	55	16	27	10	332
20–24	154	97	73	6	35	9	374
25–29	98	42	57	7	34	6	244
30–39	150	52	44	7	38	5	296
40–49	117	30	16	6	34	4	207
50–59	69	33	1	4	28	–	135
60–69	67	55	2	4	37	–	165
70 and over	75	57	–	2	91	1	226
Not known	2	5	1	–	2	–	10
All ages	**855**	**542**	**251**	**77**	**398**	**41**	**2,164**

Source: O'Connor 1993

Injury severity

In 1990 there were 2,318 road injury fatalities, nearly 40,000 hospital admissions and nearly 120,000 hospital accident and emergency department attendances (Federal

Office of Road Safety 1990; O'Connor 1993; KPMG Peat Marwick 1993). For every fatality there were 17 hospital admissions and 50 hospital attendances.

There has been a general reduction in the number of fatalities and severe injuries. The 20% reduction in fatalities between 1988 and 1990 was accompanied by a 19% reduction in admissions in the critical category, the most severe injury category for admissions. However, over this period there was a lesser reduction, of only 12%, in less serious injury (O'Connor 1993).

Injury severity of people admitted to hospital varies with road user activity. Few pedestrians suffer minor injury. Injured motorcycle riders have a higher proportion of moderate to serious injuries than other injured road users. Cyclists have a substantially higher proportion of moderate injuries compared with other road user types and a lower proportion of more severe injuries.

Body region of injury

Table 2.14 follows the convention in injury studies that fatalities are attributed to injury to the most severely injured body region. There is also a category for multiple injury. The table shows head injury, chest injury, and multiple injury, which have rates of 4, 3, and 3 per 100,000 of population respectively, as the leading body regions involved in death in road crashes.

Table 2.14: ***Road injury fatality and hospital separation rates, by body region of most severe injury, 1990***

	Fatalities		Principal diagnosis		All diagnoses	
Body region	**Rate per 100,000**	**% change 1988 to 1990[(a)]**	**Rate per 100,000**	**% change 1988 to 1990[(a)]**	**Rate per 100,000**	**% change 1988 to 1990[(a)]**
External	0.2	(b)	40	−13.6	118	−9.4
Head	4	+7.4	45	−23.3	58	−27.8
Face	< 0.1	b	13	−14.1	28	−14.2
Chest	3	−10.6	16	−4.2	34	−9.0
Abdomen	0.4	−52.4	6	−9.5	12	−5.0
Spine	0.4	−53.1	12	−4.5	19	−12.0
Upper extremity	< 0.1	(b)	33	−3.7	58	−7.5
Lower extremity	0.1	(b)	47	−6.6	80	−12.1
Multiple	3	53.5	na	na	na	na
Unspecified/ Other	2	95.2	22	−8.8	31	+37.9
Total	**13**	**−19.8**	**232**	**−11.6**	**438**	**−10.8**

(a) Per cent change in number of cases between 1988 and 1990.

(b) Percentage base less than 50 cases for 1988.

Source: O'Connor 1993

The injury rate (for principal diagnosis) to the lower extremities is 47 per 100,000 compared with 45 for the head, 33 for upper extremity, 16 for chest, and 12 for spine. Head injuries (as principal diagnosis) declined by 23% between 1988 and 1990, compared with a 12% decline for all other body regions (Table 2.14).

For pedal cyclists, the greatest reduction in injury rate between 1988 and 1990 occurred in injuries to the head, which decreased by 16%, whereas injuries to the face increased by 14%. The reduction in head injuries was expected on the basis of research evidence (Finch et al. 1993) of increased helmet wearing and the effectiveness of helmets in reducing injury to the head.

More head injuries to pedestrians were in the serious to critical categories than was the case with driver head injuries (39% and 22%, respectively). Pedal cyclists were the road user group with the lowest proportion (15%) of admissions to hospital for head injuries which were in the serious to critical categories.

Nature of injury

Intracranial injury (excluding skull fracture) made up 16% of principal diagnoses, with a population-based rate of 38 per 100,000. Between 1988 and 1990, intracranial injuries for principal diagnoses declined by 25%, representing the greatest decline of any injury type.

Lower limb fractures were also common principal diagnoses, with a rate of 35 per 100,000. These injuries have not declined substantially over recent years. Fractures of the spine, trunk and upper limbs, which also constituted a substantial proportion of principal diagnoses, have decreased only slightly.

Length of stay in hospital

Vehicle occupants constitute 45% of road injury admissions and contribute 45% of total occupied bed-days due to road injury. Only 12% of hospital admissions are pedestrians who contribute 19% of total bed-days. Pedestrians have a substantially higher average length of stay than any other road user group (Table 2.15). This is partly due to the high proportion of elderly people among injured pedestrians.

Table 2.15: *Road injury hospital separations, by length of hospital stay and road user type, 1990*

	Length of stay				
Road user type	**1 to 2 days**	**3 to 6 days**	**More than 6 days**	**Mean bed-days**	**Total bed-days**
Driver	4,889	2,358	3,091	7.7	80,054
Passenger in motor vehicle	3,703	1,702	2,193	8.2	61,964
Motor cycle rider	1,982	1,286	1,867	9.2	47,192
Pedal cyclist	4,122	1,283	861	3.9	24,710
Pedestrian	1,742	943	2,070	12.9	61,343
Unspecified / Other	2,947	1,164	1,424	7.6	42,105
Total	**19,386**	**8,736**	**11,505**	**8.0**	**317,369**

Source: O'Connor 1993

People with lower-limb injuries use 36% of total occupied bed-days for road injury. Average length of stay is highest for spinal injury and lower-limb injuries (Table 2.16).

Table 2.16: *Road injury hospital separations, by length of hospital stay and body region of principal diagnosis, 1990*

Body region	Length of stay 1 to 2 days	3 to 6 days	More than 6 days	Mean bed-days	Total bed-days
External	4,300	1,529	927	3.8	25,525
Head	5,014	1,118	1,577	7.7	59,150
Face	1,101	617	418	4.6	9,773
Chest	823	929	887	7.1	18,760
Abdomen	275	206	534	10.1	10,240
Spine	682	471	840	15.0	29,991
Upper extremity	3,237	1,280	1,053	4.9	27,433
Lower extremity	1,603	1,889	4,578	14.2	114,843
Unspecified / Other	2,341	695	691	5.8	21,655
Total	**19,386**	**8,736**	**11,505**	**8.0**	**317,369**

Source: O'Connor 1993

Timing of death in road crashes

Vehicle occupants make up the majority of cases dying at any time before or after provision of treatment or transport. The proportion of road crash victims who die instantaneously is 22% for drivers, 11% for pedestrians, 13% for cyclists, 18% for motorcycle riders, and 21% for vehicle passengers. Half of the road crash victims who die in hospital are vehicle occupants, and more than a quarter are pedestrians.

Alcohol involvement

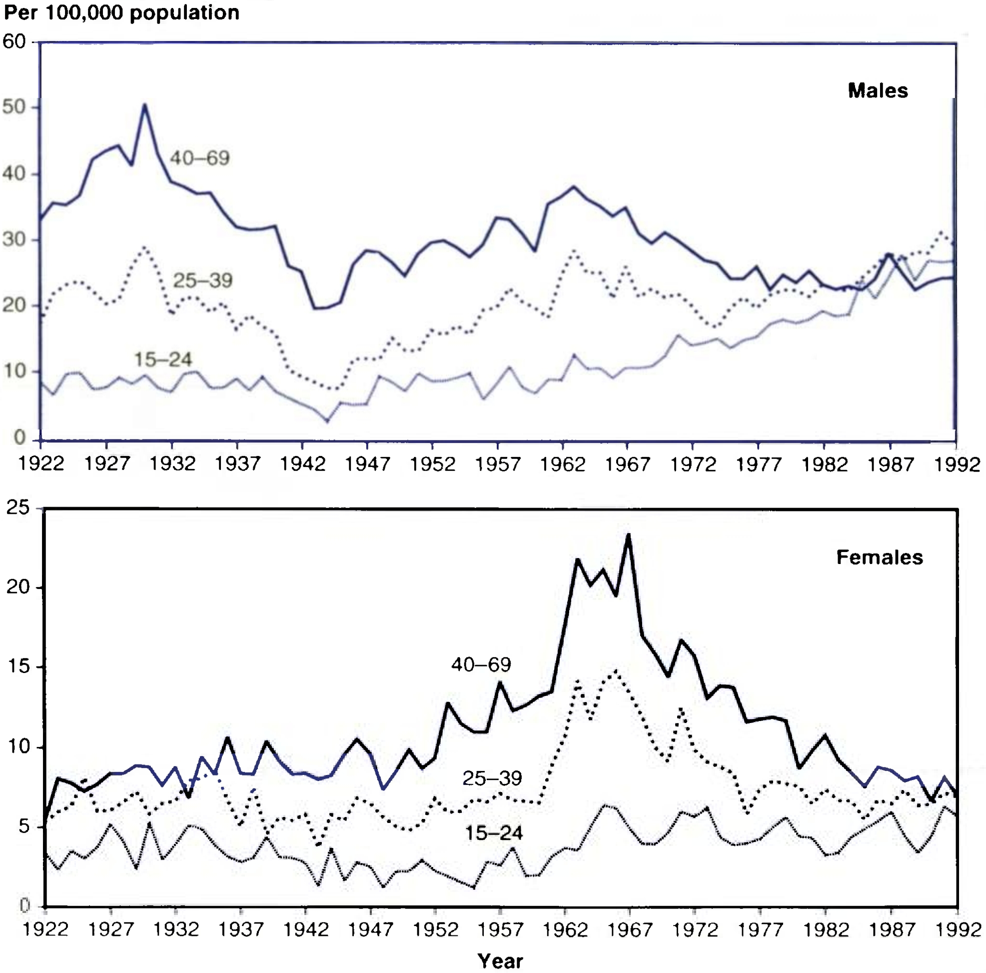
Alcohol is the single most important human factor in road crashes. The relationship between the risk of crash involvement and level of alcohol in the blood has been shown to be strong. The crash involvement of drivers having a blood alcohol concentration (BAC) in the range 0.10–0.149 was 6 times that of drivers having a BAC of less than 0.05 (McLean; Holubowycz & Sandow 1980).

Attewell & Dowse (1992) showed that the proportion of road fatalities tested for BAC who had a BAC in excess of 0.05 was higher for pedestrians (42%) than for motorcycle riders (41%) and car drivers (37%). Recently, problems with data on alcohol involvement in road crashes have been detected. They include under-enumeration and bias in data both on fatalities and hospital admissions (Trembath & O'Connor 1993). For example, in the road crash databases collated by the Federal Office of Road Safety from police and coroners' reports of road crashes, the level of BAC is missing for 25% of drivers killed and 40% of drivers admitted to hospital. There is further evidence of a higher proportion of high BAC readings not reported to police among vehicle drivers attending hospital after crashes; this suggests that estimates based on police data are biased towards a lower BAC level. These problems are being identified and addressed in a study under the National Injury Surveillance Unit Road Injury Information Program.

2.7 Suicide and other self-injury

There are now more deaths in Australia from suicide than from motor vehicle traffic crashes.

In recent years there has been considerable attention given to the increasing suicide rates among young males. This is not a new phenomenon; suicide has been an increasing problem in young males since the 1950s (Figure 2.14). The change in pre-existing trend has in fact occurred in older men, where suicide rates have recently stabilised after a period of decrease. There were high male suicide rates during the depression years around 1930, and low suicide rates during the 1939–45 war (Figure 2.14).

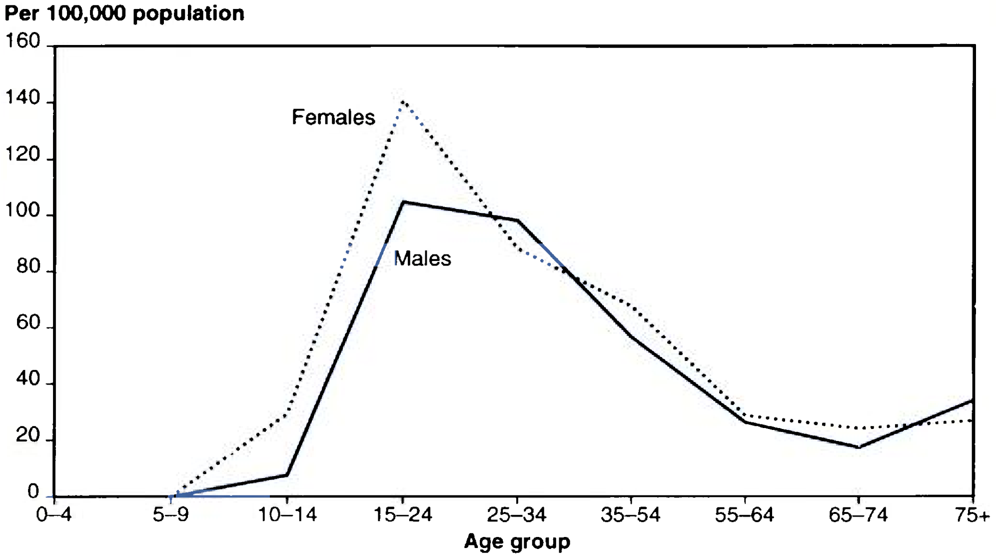


Source: AIHW National Injury Surveillance Unit unpublished data

Figure 2.14: *Suicide and self-inflicted injury, selected age-specific death rates, by sex, 1922 to 1992*

Suicide in women has exhibited very different long-term trends. The highest rates occurred in the 1960s, since when rates below age 25 have changed little and rates past age 25 have slowly decreased.

Many people who attempt suicide are admitted to hospital. Figure 2.15 shows hospital admission rates of suicide or attempted suicide in New South Wales in 1991–92. Only at ages 15 to 24 are female suicide admission rates substantially higher than male. For both sexes, the great majority of suicide attempts admitted to hospital involve self-poisoning. Other methods of suicide tend to lead to rapid death, or to 'near misses' with little or no injury. In either case, admission is unlikely.



Source: AIHW National Injury Surveillance Unit unpublished data

Figure 2.15: ***New South Wales hospital admissions due to intentional self-inflicted injury, by age-group and sex, 1991–92***

Suicide is not always identified as such. For example, suicide by motor vehicle crash is usually very difficult to distinguish from many types of accidental death from motor vehicle crash, as is suicide by overdose in a drug abuser. Also, in Australian culture, suicide tends to carry a stigma (until recently it was a criminal offence), which may lead family or professionals to tend to under-report suicides and attempted suicides. The rates shown in this section must therefore be regarded as possibly underestimating the problem.

The use of particular means of suicide varies with sex, age and other factors, and has changed over time. For males, firearms account for a large proportion of suicides; the proportion has decreased somewhat over the last few years. There was a period to 1940 when self-poisoning was a more common method of suicide in males than it was for the next 20 years; self-poisoning (mostly by pharmaceuticals) became relatively frequent again in the 1960s, but has since become less so. This largely reflects decreasing prescription of barbiturates and hence decreased availability of these drugs. Hanging has become a more frequent method of suicide (Figure 2.16, page 110).

Suicide is less common in females, and poisoning is the dominant means. The time trends for each means are similar to those for males. Note that the vertical scale of Figure 2.16 is different for females.

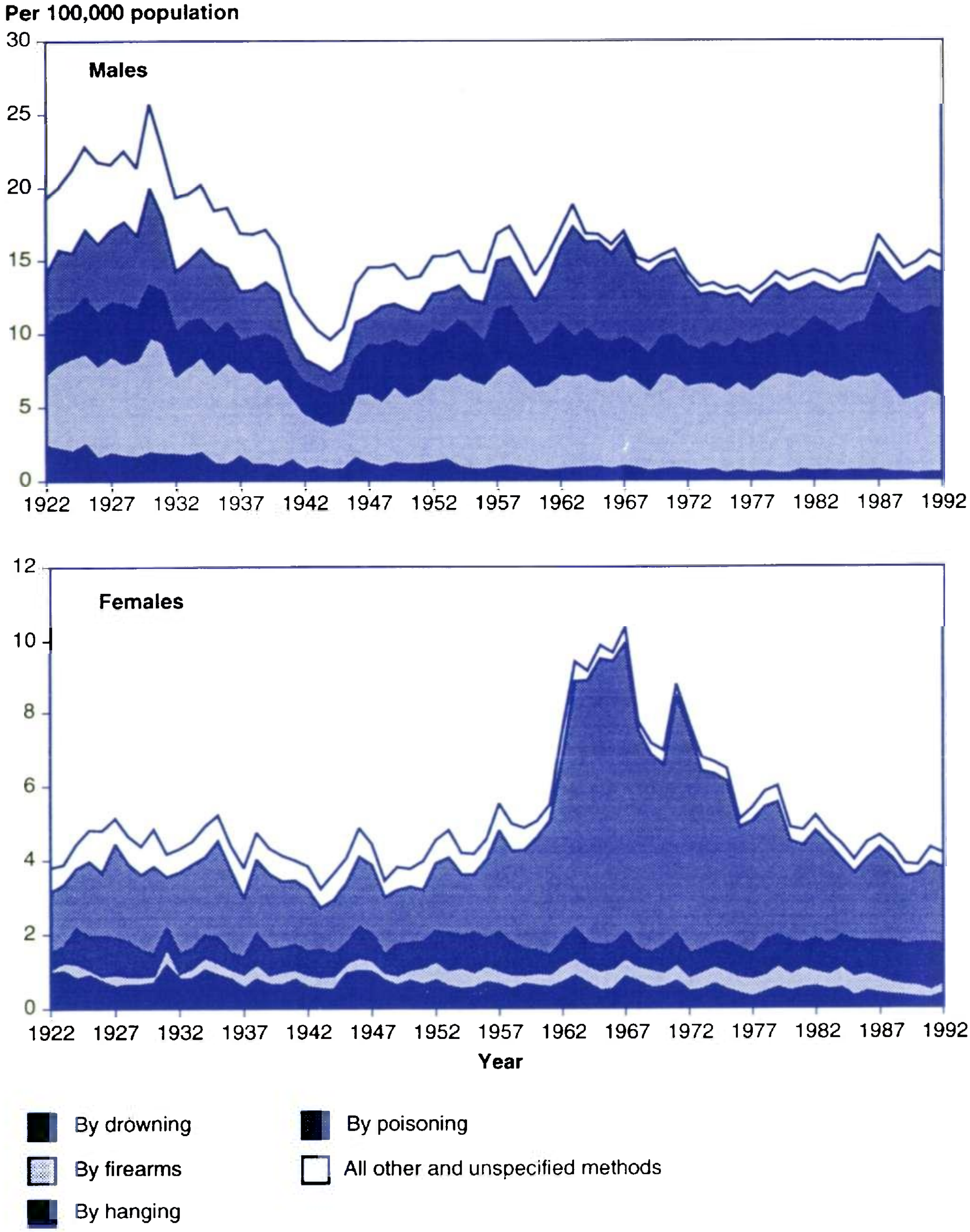
For both sexes, poisoning by motor vehicle exhaust has become a more common means of suicide; drowning, jumping from high places, and cutting and stabbing have become less frequently used methods.

A research paper prepared for the National Health Strategy (National Health Strategy 1992a) examined suicide rates in subgroups of the population. It found that the suicide rate for men aged 25 to 64 changed progressively through five categories of socioeconomic disadvantage of area of residence (see Box 2.3, page 111), being lowest among men who lived in the least disadvantaged areas and highest among men living in the most disadvantaged areas. Women living in the most disadvantaged areas had the highest suicide rates, but there was no progressive change in the other four categories of socioeconomic disadvantage of area of residence (Table 2.17, page 112).

Other findings of the National Health Strategy review (see Table 2.17) were that suicide rates among unemployed men, including those not in the workforce, were 8% higher than in employed men. Suicide rates for men were similar in metropolitan and non-metropolitan areas, but women in non-metropolitan areas had lower suicide rates than women living in metropolitan areas. In both sexes, suicide rates at 25 to 64 years were much higher among the never married, and among the divorced and widowed, than among those currently married. Men and women born in Asia had lower suicide rates than those born in Australia; those born in Europe had similar rates to those born in Australia.

Suicide in Aboriginals received some prominence in relation to the work of the Royal Commission into Aboriginal Deaths in Custody. Research papers prepared for the Royal Commission found that although Aboriginals died in police custody at a rate more than 40 times that of non-Aboriginal people, and in prison at a rate 13 times that of non-Aboriginal people, both findings were almost entirely explained by the over-representation of Aboriginal people in custody (Biles, McDonald & Fleming 1992a, 1992b).

A complex web of environmental and behavioural factors needs to be understood if public health action against suicide is to be effective. Currently, the question of the potential benefit of more stringent firearm controls is being debated. Although stringent gun control has plausibility as a possible intervention, available data and research cannot provide a clear picture of intended and unintended consequences of such a measure.



Source: AIHW National Injury Surveillance Unit unpublished data

Figure 2.16: ***Methods of suicide, age-standardised rates by sex, 1922 to 1992***

Box 2.3: Socioeconomic disadvantage of area

Aggregate socioeconomic characteristics of the populations of defined geographical areas represent the characteristics of the local environment but can also be used as a proxy for individual socioeconomic status. The value of such indexes decreases as the size of the areas increases, as larger areas are more likely to be heterogeneous.

ABS has constructed a number of socioeconomic indexes designed to categorise areas on the basis of information collected in the 1986 Population Census (ABS 1990). The indexes are compiled at small geographic levels known as Collection Districts and then aggregated to larger geographic areas such as postcodes or Statistical Local Areas (SLAs). A Collection District is equivalent to a small group of suburban blocks in urban areas. Most SLAs correspond to local government areas.

The Index of Relative Socio-Economic Disadvantage (IRSD) is constructed by summarising information from social and economic variables relating to socioeconomic disadvantage, such as low income and high unemployment. An area with a comparatively large proportion of disadvantaged households has a low IRSD.

The IRSD is compiled from the following variables, expressed as ratios or percentages of the population):

- *family income of less than $12,000*
- *households with no motor cars*
- *households with one or no bedrooms*
- *households renting (non-government)*
- *households renting (government authority)*
- *households in improvised dwellings*
- *no qualifications*
- *left school less than 15 years of age*
- *never at school*
- *employed males classified in Trades*
- *employed females classified in Trades*
- *employed females classified in Sales/Personal*
- *employed people classified as Labourer or related*
- *males unemployed*
- *females unemployed*
- *families consisting of Head and dependents*
- *aged 15+ separated or divorced*
- *occupied dwellings with 2 or more families*
- *Aboriginal or Torres Strait Islanders*
- *recent migrant from non-English-speaking country*
- *lacking English fluency.*

Mortality data supplied by ABS normally contains the SLA of usual residence of the deceased person. Men and women dying aged 25 to 64 years were classified into quintiles of socioeconomic disadvantage according to the value of the IRSD for their SLA of usual residence. This was either missing or could not be mapped to an IRSD value for 3% of male and 2% of female deaths. These deaths were excluded from the analysis.

The quintiles are defined so as to contain equal numbers of people aged 25 to 64 years. The first quintile contains people living in the least disadvantaged areas and the fifth quintile contains people living in the most disadvantaged areas.

Table 2.17: *Suicide, by socioeconomic differential and sex, age 25 to 64 years, 1985–1987 (rate ratio)*

Differential	Males	Females
Socioeconomic advantage		
First quintile	1.00	1.00
Second quintile	1.25 *	0.94
Third quintile	1.28 *	1.05
Fourth quintile	1.43 *	0.96
Fifth quintile	1.77 *	1.46 *
Employment status		
Employed	1.00	na
Unemployed / Not in workforce	1.08	na
Marital status		
Married / Separated	1.00	1.00
Never married	2.84 *	2.76 *
Divorced / Widowed	3.37 *	3.33 *
Country of birth		
Australia	1.00	1.00
UK / Ireland	0.99	1.09
Other Europe	1.05	1.08
Asia	0.49 *	0.76
Other	1.13	0.79
Location		
Metropolitan	1.00	1.00
Non-metropolitan	1.04	0.74 *

* $p < 0.001$

Source: AIHW unpublished data, derived from ABS 1985–1987 mortality data

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3 Health service organisation, funding and expenditure

3.1 Structure and administration of health services in Australia

The health care system in Australia is pluralistic, complex and loosely organised. A distinguishing feature is the extent to which responsibilities are split between different levels of government. The system involves Commonwealth, State and local governments, as well as public and private providers, both individuals and institutions. Governments increasingly are influencing the structure of health services, although most medical and dental care and some other professional services are provided by private practitioners.

Although the relative responsibilities have changed greatly since Federation in 1901, State and Territory governments retain the major responsibility for the public provision of health services, including public and psychiatric hospital systems, and for public health. The health responsibilities of local governments vary from State to State, but are mainly in environmental control and in a range of personal preventive and home care services.

A Commonwealth Department of Health was not established until 1921, and for many years its main responsibility was quarantine. The Commonwealth Government also exercised some responsibility for the health needs of veterans. An amendment of the Constitution in 1946 gave the Commonwealth powers to make laws about pharmaceutical, sickness and hospital benefits, and medical and dental services. These powers, and the provision of specific-purpose grants to States under Section 96 of the Constitution, have enabled the Commonwealth to expand its role in the health system.

Since the 1950s, the Commonwealth Government has introduced major benefit schemes covering medical, pharmaceutical, hospital and nursing home services, and has established a number of other health programs, many of which have involved funding through specific-purpose grants. Important recent programs in the latter category are directed towards health promotion, towards the control of alcohol and drug abuse, and against AIDS.

In recent years, governments have been taking an increasing interest in promoting health, and additional resources have been provided for the measurement of health, the evaluation of health services, the promotion of well-being and the prevention of illness and disability.

Commonwealth, State and Territory health authorities

The structures of the various Commonwealth, State and Territory health authorities have most recently been described in *The Australian health care system 1992* (Grant & Lapsley 1993). Comparison of editions of this annual publication shows that the structures have undergone frequent change, involving the reallocation of functions to new and different divisions within departments, the transfer of functions to and from other departments, or the amalgamation of entire departments. Peripheral health units have had to make rapid adjustments to these changes in central agencies.

At the Commonwealth level, the most recent change was the expansion of the Department of Health, Housing and Community Services following the 1993 election. Local government was added to its responsibilities, so that it became the Department of Health, Housing, Local Government and Community Services. Late in 1993 its name was altered to the Department of Human Services and Health (DHSH), and in 1994 responsibility for housing and for local government passed to a new Department.

State and Territory health administrations also have been reorganised or renamed many times, usually as departments or commissions. Some jurisdictions have combined health and community services functions, whereas others have kept them separate. The momentum has been towards the creation of central agencies with varying degrees of delegation of responsibility to regional or area authorities. The principal functions of State and Territory authorities include:

- hospital services
- mental health programs
- dental health services
- systems of extended care
- child, adolescent and family health services
- women's health programs
- health promotion
- rehabilitation systems
- regulation, inspection, licensing and monitoring of premises, institutions and personnel.

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

Other Commonwealth Government agencies

Most health programs in the public sector are administered by health authorities, but other government departments and agencies have important roles. The Commonwealth Department of Veterans' Affairs arranges medical care for ex-service personnel and other beneficiaries. Statutory bodies within the Human Services and Health portfolio include the Australian Institute of Health and Welfare, the Australian Hearing Service, and the Commonwealth Rehabilitation Service.

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

Worksafe Australia is responsible for occupational health policy and standards development, and State and Territory agencies (in many States and Territories not the health authorities) administer occupational health legislation.

Environmental health and hygiene

Health surveyors, usually employed by local governments, undertake surveillance of environmental hygiene and sanitation practices to ensure compliance with State and Territory public health law. Statutory water supply authorities are responsible for the quality of piped water and in some areas for sewage disposal and drainage. Another set of authorities is responsible for monitoring and regulating air quality. Central agencies have been established in most States to control the disposal of wastes, and these agencies administer the disposal sites in metropolitan areas, leaving local government to be responsible for the collection and transport of waste material.

Institutional health services

Public general hospitals in most States are administered by hospital boards constituted as corporate entities. Some are administered by religious or charitable bodies. Where area health boards have been established, as in New South Wales, public hospitals are managed by executive personnel responsible to the area board. Public hospitals have become increasingly dependent on State grants and are required to comply with conditions of subsidy.

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

In 1991–92, 25.7% of acute hospital beds were in private hospitals. These hospitals may be run by religious or charitable organisations or by proprietors operating for profit.

Nursing homes provide accommodation and long-term nursing care for chronically ill, disabled or demented patients. The Commonwealth incurs most of the financial burden of running nursing homes, providing a daily monetary benefit to help each resident meet the cost of care. The resident is not required to contribute more than 87.5% of the sum of the single-rate pension and rent assistance.

To ensure that only those who are highly dependent are placed in residential care, aged care assessment teams have been established nationally. They recommend a large proportion of people for care outside institutions and make appropriate referrals to other services.

Community health services

In 1985, the Home and Community Care program was established to support services for frail aged and younger disabled people who are not in residential care. The aim of the program is to enhance opportunities and to avoid inappropriate admission to institutions. The program is administered jointly by the Commonwealth and each State and Territory, and innovative services have been introduced to meet the needs of groups with special requirements.

Medical care outside hospitals is based on general practitioners, mainly in private practice, who constitute the principal gateway to specialised services. In addition, State and local government health authorities are active in the fields of health promotion and disease prevention. Advisory services are provided at baby health centres, antenatal clinics and community health centres. Immunisation clinics are offered.

Community mental health services and community services for older people expanded quite rapidly after the early 1970s and are provided through a variety of government and non-government agencies. The services have grown in a relatively uncoordinated manner, and interaction with private clinical services has been variable.

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

Information, coordination and research

Government agencies routinely collect and analyse data produced in the course of managing their programs. Selected information of this kind is transmitted to the Australian Institute of Health and Welfare, where it is incorporated into national data sets and used to prepare reports on the health of Australians and their health services. The Australian Bureau of Statistics conducts large-scale population surveys of health and health services.

The Australian Health Ministers' Advisory Council (AHMAC) is a committee of the heads of the Commonwealth, State and Territory health authorities and the Commonwealth Department of Veterans' Affairs. AHMAC advises the Australian Health Ministers' Conference (AHMC) on resource matters and financial issues. AHMC also considers recommendations from the National Health and Medical Research Council (NHMRC). Specific national bodies have been established to coordinate information and advice on major problems such as drug and alcohol abuse, and AIDS.

The NHMRC was established in 1936, but was created as a separate statutory body in 1993. It is responsible for the coordination of public health policy at the national level. Its principal concerns today are with medical research, professional aspects of health care, public health, public health research and development, and health ethics.

In addition to research that is funded through NHMRC, the Department of Human Services and Health administers separate extramural research programs primarily to provide additional program management information. Some States provide substantial infrastructure support for medical research institutes established in association with their universities and teaching hospitals, and revenue from special State tobacco taxes supports health research as well as health promotion activities.

Paying for personal health care

Another Commonwealth statutory authority, the Health Insurance Commission (HIC) administers the Medicare program of universal health insurance and the Pharmaceutical Benefits Scheme.

Medicare

Medicare, a universal system of health insurance, came into operation in 1984. All people normally resident in Australia, except foreign diplomats and their dependants, are eligible for Medicare benefits. Short-term visitors, except those from countries with which agreements have been made, are not eligible. A schedule of fees has been established, and benefits for medical services in the community relate to that schedule. The amount of benefit also depends on the fee charged. Doctors are not obliged to adhere to the schedule fees, but if they direct bill the HIC for any service, the amount payable is the Medicare benefit and the patient is not required to pay any additional amount.

Benefits are also paid for services provided by optometrists and for oral surgery performed by dental surgeons.

For private patients in hospitals, the Medicare benefit is only 75% of the schedule fee, but the gap between benefit and schedule fee is insurable. In other circumstances, gaps cannot be covered by private insurance, and insurance to cover amounts paid in excess of the schedule fee is prohibited.

For all beneficiaries (individuals and registered families), if the sum of the gaps between benefits and schedule fees exceeds a specified amount in any year, the full schedule fee is reimbursed for services during the remainder of the year. This 'safety net' threshold is linked to the Consumer Price Index, and is adjusted each year.

Agreements between the Commonwealth and State and Territory governments provide for all Medicare beneficiaries to obtain inpatient and non-inpatient care at public hospitals without charge. Medical care is provided for such 'public' patients (at no cost to them) by doctors appointed by the hospitals. Private health insurance can be purchased to cover charges in private hospitals, and for private status in public hospitals. Private patient charges in public hospitals are set at levels agreed by the Commonwealth. Private health insurance arrangements are described in greater detail in Box 3.3, page 136.

Pharmaceutical Benefits Scheme

The Pharmaceutical Benefits Scheme (PBS) subsidises the cost of a wide range of drugs and medicinal preparations. Its aim is to ensure that individuals are not financially precluded from access to these items.

There is a set price for every item covered by the scheme. Patients are grouped into two classes. Concessional beneficiaries, that is, holders of Pensioner Health Benefits Cards and certain other entitlement cards issued by the Departments of Social Security and of Veterans' Affairs, pay $2.60 for each item. General beneficiaries, that is, all others, pay the first $16.00 for each item. In each case they also pay additional amounts where the brand dispensed costs more than the basic level for the drug. The pharmacist then claims the remainder of the set price from the HIC.

The PBS also includes a safety net arrangement, which has been changed many times since its introduction in 1986. These changes, which from November 1990 to December 1993 incorporated a two-tier safety net for general beneficiaries, are shown in Table 3.1. In 1994, after a family of general beneficiaries had spent $400 on pharmaceutical benefits, they became entitled to benefits at the concessional rate of $2.60 for the rest of the calendar year; for subsequent years the $400 threshold was to be increased for CPI movements.

Table 3.1: *History of the Pharmaceutical Benefits Safety Net arrangements, 1986 to 1994*

	General beneficiaries			
	Safety Net tier 1		**Safety Net tier 2**	
Date of introduction	**Patient contribution**	**Annual limit**	**Patient contribution**	**Annual limit**
November 1986	$10.00	25 items	–	na
July 1988	$11.00	25 items	–	na
November 1990	$15.00	(a)$300.00	$2.50	(a)$50.00
August 1991	$15.70	(a)$309.90	$2.60	(a)$51.60
August 1992	$15.90	(a)$312.30	$2.60	(a)$52.00
January 1994	$16.00	$400.00	$2.60	No maximum

	Concessional beneficiaries	
Date of introduction	**Patient contribution**	**Annual limit**
November 1986	$2.50	25 items
October 1991	$2.60	25 items
January 1991	$2.60	$130.00
January 1992	$2.60	$135.20

(a) Effective for the following calender year.

Source: AIHW unpublished data

For concessional beneficiaries the safety net operates differently. From 1992, after a purchase of 52 items at the concessional rate of $2.60, they became entitled to receive Pharmaceutical Benefits items free for the rest of the calendar year.

The items that attract benefits are revised frequently. Unsubsidised prescribed items can also be bought at pharmacies, and many remedies can be purchased without prescription.

Other health benefits

Registered health benefit funds also offer insurance for services not covered by Medicare, notably private dentistry, physiotherapy, chiropractic and appliances, and for prescribed medicines not covered by pharmaceutical benefits.

Health promotion and disease prevention

The promotion of health and the prevention of disease have been receiving increasing emphasis in recent years. Specifically designed preventive services include infant health centres, school medical and dental services, the fluoridation of water supplies, immunisation programs, anti-smoking campaigns, the national AIDS program and the National Campaign Against Drug Abuse. State and Territory health authorities have branches concerned with health education services and health promotion.

There is increasing government awareness that the health of the nation depends not on its health services alone, but on levels of nutrition, education, employment, income and housing, general standards of hygiene, environmental safety and the availability of cultural and recreational amenities. These social factors, in turn, are influenced by the market, and by financing and regulatory arrangements at different levels of government. Most of the factors influencing health are outside the immediate responsibility of health departments, although Australian governments have begun to show a commitment to ensuring that all areas of public policy recognise impacts on health.

Health authorities now accept responsibility for monitoring the impact on health of harmful elements in the social, economic and physical environments. Their aim is to create an environment which nurtures healthy living. Health workers have long been involved in motivating people to modify their behaviour in ways that enhance good health. During the 1980s it increasingly was recognised that people are not entirely free to choose particular lifestyles. They adapt their behaviour to their life situations. Consequently, emphasis must be placed on the alteration of adverse influences on health that are beyond the control of the individual.

3.2 Health service funding and expenditure

This section describes total health expenditure, expenditures by the different components of the health care system and the sources of funding for the system. It also examines some factors contributing to changes in health expenditure and compares health expenditure among States.

Health expenditure in Australia

In 1992–93, health expenditure by Australian governments and individuals was $34,338 million, an average of $1,944 per person (Table S42, page 279 and Table S45, page 281). Health expenditure represented 8.5% of gross domestic product (GDP), an increase of 0.8 percentage points from recent years (Table S44, page 281).

Of the $34,338 million expended on health, governments provided $23.2 billion, the Commonwealth Government providing $15.1 billion and State and local governments $8.1 billion. The private sector provided $11.1 billion.

Since 1984–85, the proportion of total expenditure funded by governments has fallen from 71% to 68%, with the private sector proportion rising from 29% to 32%. The fall in the proportion of health expenditure provided by governments results from a combination of falls in Commonwealth funding from 46% to 44% of total expenditure, and State and local government funding from 25% to 23%. Trends in the contributions from Commonwealth government, State and local government, and the private sector are displayed in constant price terms in Figure 3.1 (page 125). The contributions from all three sources has increased slowly over the years, with major changes at times of change of health insurance agreements.

Figure 3.2 (page 126) shows expenditure for 1990–91 (the most recent year for which complete data are available) according to source, Commonwealth government, State government, or private. Recurrent health expenditure was $29,162 million, 94% of the total $31,132 million. The expenditure on acute hospitals was $11,063 million, made up of $9,242 million on public acute hospitals and $1,821 million on private hospitals. Between 1983–84 and 1990–91, the proportion of recurrent expenditure devoted to acute hospitals declined from 40.0% to 37.9%.

In 1990–91, nursing home care was responsible for $2,550 million (8.7% of the $29,162 million of recurrent health expenditure), medical services for $5,499 million (18.9%), pharmaceuticals $2,803 million (9.6%) and dental services $1,501 million (5.1%). A total of $1,202 million (4.1%) was spent on other health professional services, such as physiotherapy, chiropractic and podiatry (see Table S49, page 286).

Box 3.1: Health expenditure statistics

Health expenditure statistics provide the means by which the volume and proportion of economic resources allocated to the production and consumption of health services can be assessed. In addition to illustrating total health resource use—at a point in time, as well as over time—expenditure statistics can be used to show the cost of components of health services and the sources from which they are funded. The most interesting questions about health expenditure relate to its share of the total economic resources, its growth over time, and how a country's performance in these respects compares with that of other countries.

Absolute dollar expenditures are significant for accounting and budgeting purposes, but they are of limited usefulness in analysis of trends in provision and use of health services, because they may be heavily influenced by non-health factors, such as general inflation and population growth.

For long-term and for international comparisons, the best single indicator is health expenditure as a proportion of gross domestic product (GDP). However, over short periods, this can fluctuate due to irregularities in the growth of GDP. Even over longer periods, international comparisons of health resources may be distorted by widely differing rates of GDP growth. Also, use of health services and GDP are influenced by the age structures of the countries being compared.

For short-term comparisons, real (adjusted for inflation) health expenditure per person may be the most useful measure, but over longer periods and in international comparisons, there are technical and conceptual difficulties with the choice and calculation of appropriate inflators and deflators (statistical techniques used to adjusted dollar expenditures to estimate 'real' amounts).

For planning and budgetary purposes, the sources of expenditure and the components of expenditure allocated to different services are of particular interest. The classification of services is undertaken in accordance with WHO conventions (Abel-Smith 1969) which, although clear in theory, are difficult to apply consistently in practice. These difficulties are particularly problematical when making international comparisons.

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

These considerations show why the interpretation of health expenditure statistics needs to take account of the specific institutional arrangements of each country.

Box 3.2: Adjustments to grants to States

The role of the Commonwealth Grants Commission is to recommend to the Commonwealth Government adjustments to General Revenue Grants to ensure 'fiscal equalisation' among the States. It enables 'each State to provide, without having to impose taxes and charges at a level appreciably higher than the levels imposed by the other States, government services at standards not appreciably different from the standards provided by the other States' (Commonwealth Grants Commission 1993a, 1993b).

The Commission's processes allow for State-specific factors such as administration, demography and physical and economic environment which might give rise to higher or lower levels of use of public services. The factors it takes into account are illustrated by those listed below, which are used for hospital services.

***Administrative scale factors** allow for the economies of scale that the more populous States can realise.*

***Input cost factors** allow for the differences between States in wage and salary costs, accommodation costs and electricity costs.*

*For the **inpatient services factors**, age and sex composition, cross-border provision of services, service delivery scale, Aboriginality, dispersion, economic environment and socioeconomic composition are taken into account. The **economic environment component** reflects the lack of private hospitals within a given population density and land area. The **socioeconomic composition component** uses weighting for people of non-English-speaking background and for social security beneficiaries. This component is to account for higher demand because of poorer health and the inability to gain access to private services.*

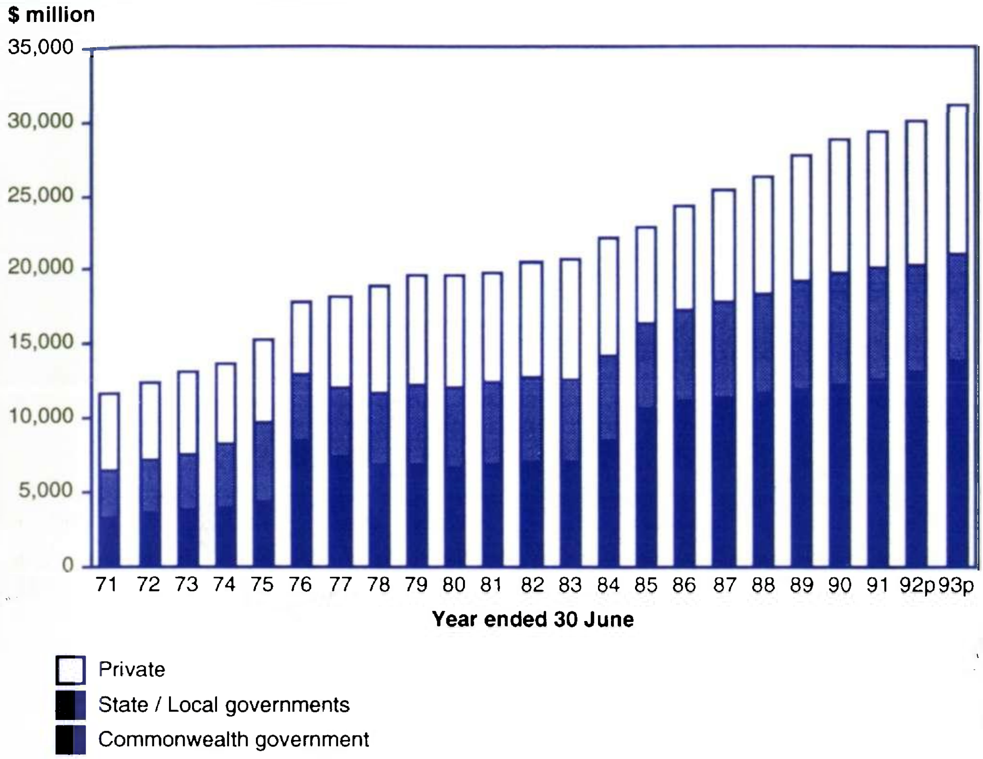
*The **non-inpatient services factor** incorporates age, sex, Aboriginality, low socio-economic status, dispersion and economic environment.*

*A **revenue raising factor** allows for the capacity of a State to raise revenue from private patients in public hospitals.*

For each component of each factor, a particular State may be advantaged (scored negatively) or 'disabled' (disadvantaged, scored positively). The components for health are totalled. For New South Wales and Victoria, which are in aggregate advantaged relative to the standard, the totals are negative. The standard expenditure is the national average of actual expenditures. A standardised expenditure is also calculated for each State. The standardised expenditure is the 'fiscally equalised' expenditure. The difference between it and the standard expresses the identified total disability or need.

Data presented by the Commonwealth Grants Commission include standard, standardised and actual expenditure.

A factor is calculated for each area of expenditure, and the factor for all sectors is derived by combining all the different sectoral factors. The combined factor determines the per person General Revenue Grant to each State.



Note: Expressed in constant 1989–90 prices. Data for 1991–92 and 1992–93 are preliminary.

Source: AIHW unpublished data

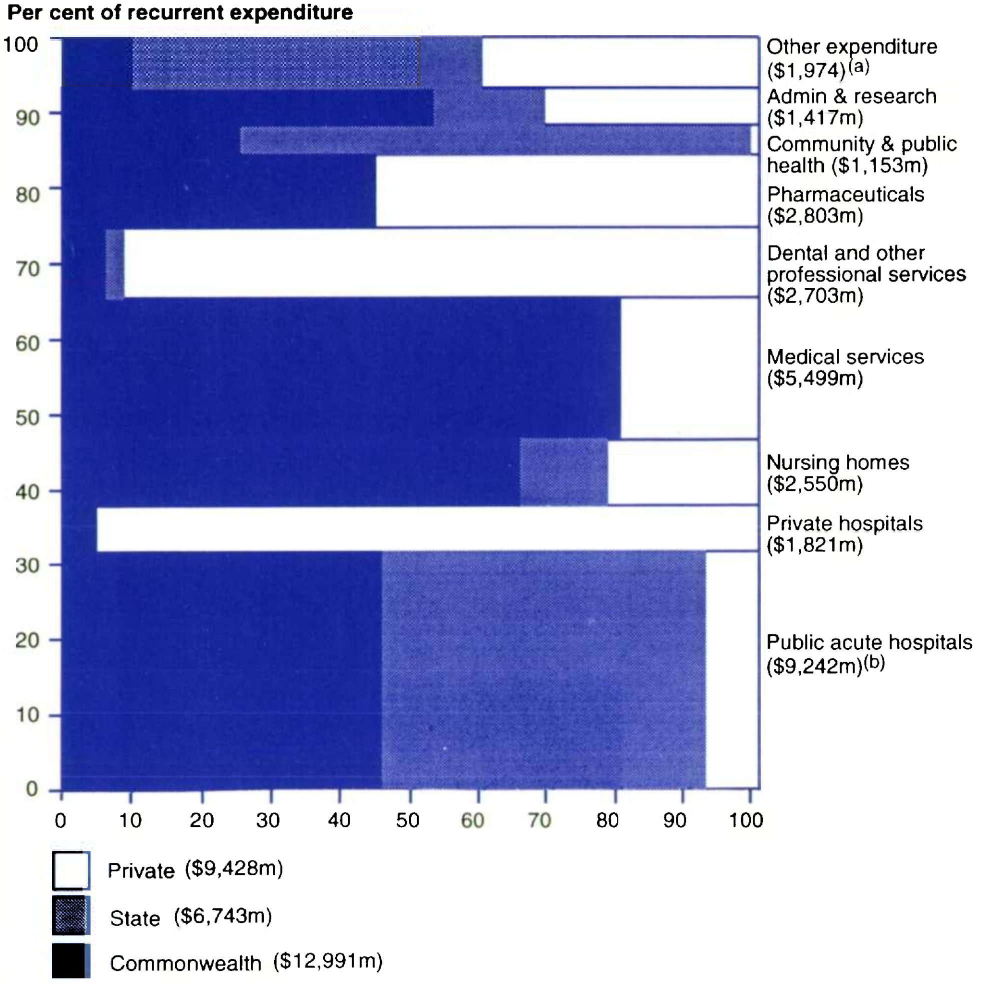
Figure 3.1: *Total health expenditure by source of funds, 1970–71 to 1992–93*

Changes in health expenditure 1975–76 to 1992–93

From 1975–76 to 1992–93, real health expenditure (in constant 1989–90 prices) increased 76% from $17,679 million to $31,068 million, an average annual increase of 3.5% (see Table S48, page 284).

Over the period 1975–76 to 1992–93, population growth was 26% (1.4% per year), and real per person health expenditure increased from $1,266 to $1,768 in 1990–91 dollars, an increase of 40%. This is an average annual increase of 2.0%, or about $680 million dollars extra spent per year on health.

Part of the increase in real health expenditure per person is due to the ageing of the population, and part reflects greater use of health services by people of all ages. Of the 40% increase from 1975–76 to 1992–93, 10% or about $170 million per year can be attributed to the increasing proportion of older people in the population.



(a) Other expenditure includes public psychiatric hospitals, ambulance, aids and appliances, and other expenditure not elsewhere classified.

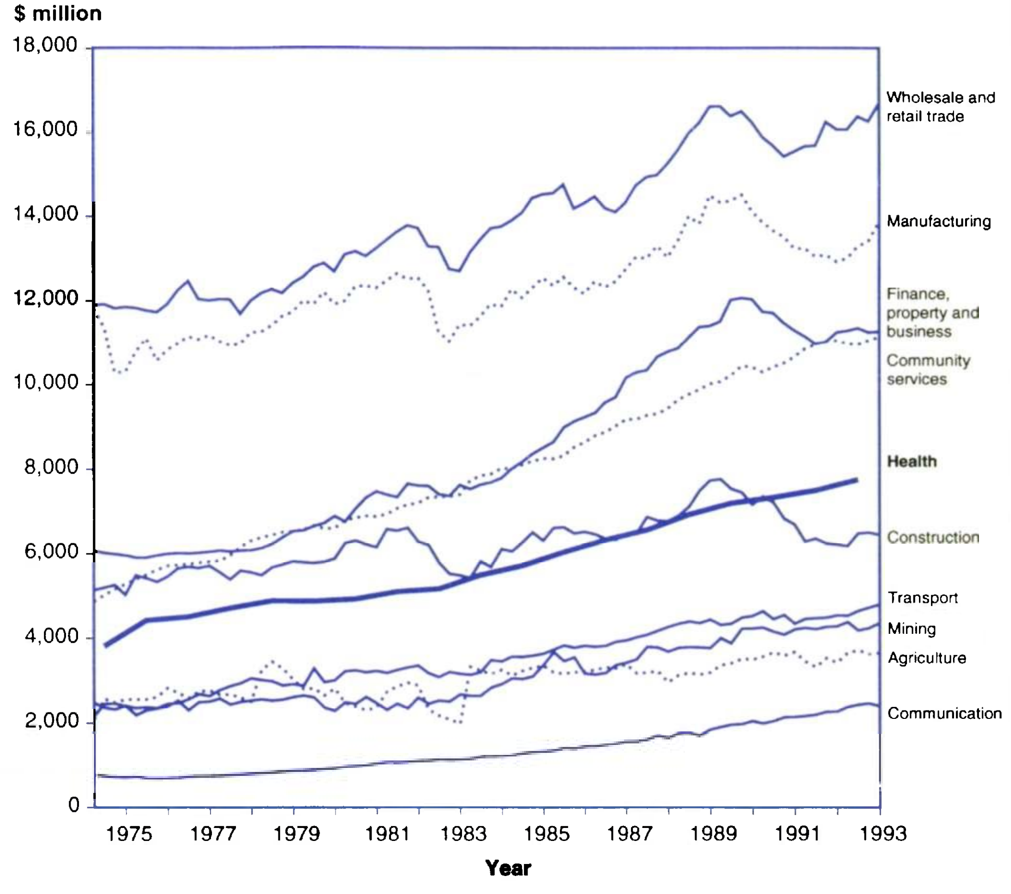
(b) Public acute hospital **expenditure** includes recognised public and repatriation hospital expenditure.

Source: AIHW unpublished data

Figure 3.2: *Recurrent health expenditure at current prices, Australia, 1990–91*

Health expenditure and the recession

Figure 3.3 shows that health expenditure grows at a relatively steady rate and is much less dependent on the business cycle than are other sectors of the economy. Manufacturing, construction, and wholesale and retail, for example, show marked fluctuations which are not seen in the health industry.



Source: AIHW unpublished data

Figure 3.3: ***GDP by industry, seasonally adjusted, constant 1989–90 prices***

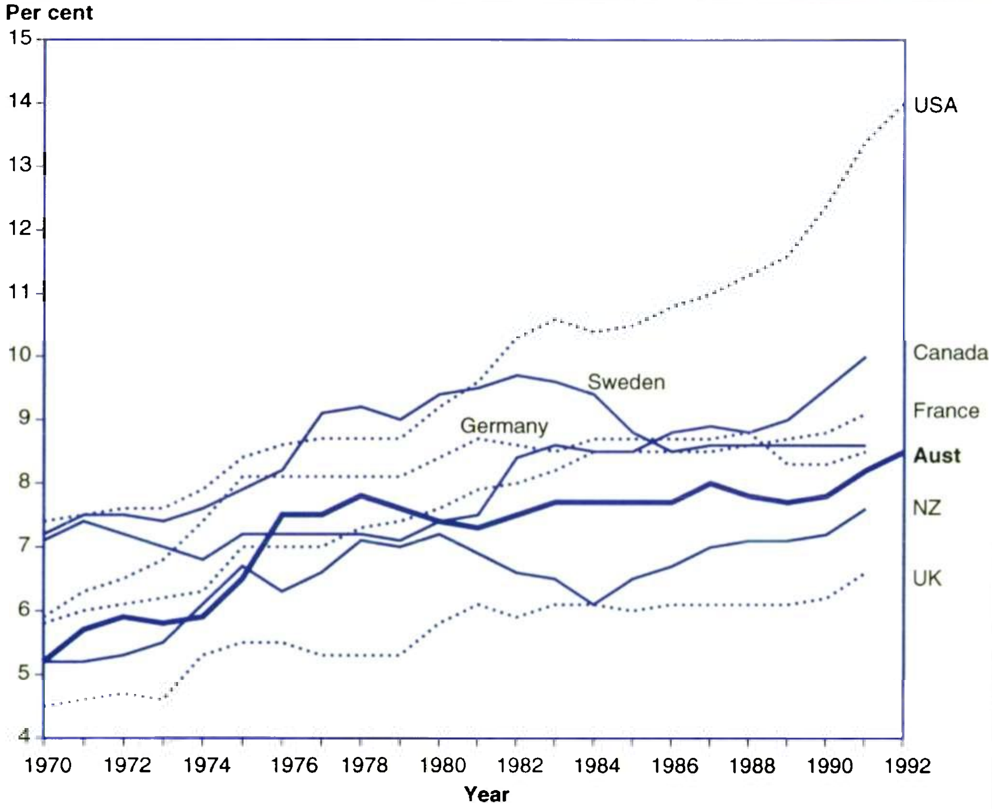
In 1990–91 health expenditure grew in real terms by 1.9% and in 1991–92 by 2.3%. The growth rates of 1990–91 and 1991–92 were below the average of 4.0% for the previous eight years. Thus there were decreases in the growth rates of health expenditure in the recession years (AIHW 1993a).

Health expenditure as a proportion of GDP varied from 7.4% to 7.8% from 1975–76 to 1989–90. In 1990–91 it increased to 8.2% and then in 1991–92 to 8.4%. These increases were due mainly to the fall in or low growth of GDP in these years. Real GDP fell 0.4% in 1990–91 and grew only 0.6% in 1991–92. If real GDP had grown in these two years at the 3.6% average annual growth rate of GDP of the previous eight years (1981–82 to 1989–90), then the health expenditure to GDP ratio in 1991–92 would have been 7.9%, not the 8.4% it actually was.

The increases in health expenditure as a proportion of GDP, therefore, can be attributed largely to the recession.

Health expenditure internationally

As noted in Box 3.1, health expenditure of nations is best compared as a percentage of GDP. This measure gives an indication of resources used in health relative to the country's ability to provide them. The change in the share of GDP expended on health depends on the growth in GDP as well as on the growth in health expenditure. Since the mid-1980s, most OECD countries have shown a levelling off in health expenditure as a percentage of GDP. The exception has been the United States (Figure 3.4).



Source: OECD 1993b

Figure 3.4: ***Health expenditure for Australia and selected OECD countries as a percentage of GDP, 1970 to 1992***

Most OECD countries have kept health expenditure as a percentage of GDP constant without experiencing adverse effects on population health. It is not known what health expenditure as a percentage of GDP is necessary to maintain population health.

From 1989 to 1991 there was an increase from 8.2% to 8.7% in the average percentage of GDP spent on health in the OECD countries listed in Table S50 (page 287). Most of this increase was due to a slowdown in economic activity, and did not indicate an unusually high increase in health expenditure (OECD 1993a, 1993b).

Despite the increase in the use of health services in Japan, health expenditure as a proportion of that country's GDP is still low relative to most other OECD countries, partly due to measurement differences and partly because it started off at such a low level. There are some indications that Japanese health expenditure may be underestimated by as much as 50%.

A number of factors contribute to the growth of health expenditure. Broadly, these factors relate to inflation, both general inflation and any excess over general inflation of cost increases in the health sector. They also relate to greater use of services as a result of population growth and greater per person use of services.

Technically, the effect of the inflation is summarised as a 'health care price deflator' (row 3 in Table 3.2, page 130), with the two component parts known as 'GDP deflator' (row 4) and 'excess health care inflation' (row 5). The effect of the greater use of services is known as 'real expenditure growth' (row 6), with its component parts known as 'population growth' (row 7) and 'per person real health expenditure growth' (row 8).

A comparison of health expenditure growth in Australia with that in a number of other countries reveals some interesting differences. Since the general inflation rate is not a characteristic over which the health system has control, the most useful index of health inflationary pressures for international comparisons is the excess health care inflation rate. This rate varies greatly from country to country. The United States rate is high at an annual average rate of 2.7%, and the Australian rate is low at 0.1%. If Australia had experienced the same excess health care inflation rate as the United States in the period 1979–80 to 1989–90, Australian health expenditure in 1989–90 would have been $7,900 million dollars (28%) higher than it was. An extra $7,900 million would have lifted health expenditure in 1989–90 from 7.8% to 10.0% of GDP. This indicates that a major contributor to control of growth in the ratio of health expenditure to GDP is the control of price increases in the health sector.

Compared with the other OECD countries considered, the higher population growth in Australia, Canada and the United States means that these countries need a higher growth in health expenditure just to keep up with population increase. The other component of real expenditure growth, the per person real expenditure growth, is the best measure of the increase in provision of health service inputs. The per person real expenditure growth in Australia of 2.2% per year over the period 1979–80 to 1989–90 is slightly higher than the mean 2.0% per year for eight selected OECD countries listed in Table 3.2, and greater than the United Kingdom, West Germany, New Zealand and Sweden.

For Australia, the 2.2% annual average growth in health expenditure per person compounds over the ten-year period to a 24% increase. Whether this substantial increase in health expenditure translates sufficiently into improvements in outcomes of treatment is difficult to answer, and depends on how effectively and wisely health professionals and health authorities used these extra resources.

Table 3.2: *Comparison of health expenditure growth in Australia and selected OECD countries, 1980 to 1990 (per cent)*

Growth components[a]	Aust	Can	Fra	[b]Ger	NZ	Swe	UK	USA	Unweighted mean
(1) Share of health expenditure in GDP 1980[c]	**7.4**	7.5	7.5	8.4	7.2	9.2	5.9	9.2	**7.8**
(2) Nominal health expenditure growth	**12.2**	10.7	10.4	5.0	12.3	8.9	9.8	10.4	**10.0**
(3) Health care price deflator	**8.2**	6.9	5.2	3.4	11.5	7.1	7.6	6.9	**7.1**
(4) Of which GDP deflator	**8.1**	5.1	6.2	2.6	9.8	7.6	6.1	4.1	**6.2**
(5) Of which excess health care inflation	**0.1**	1.8	–0.9	0.7	1.6	–0.6	1.3	2.7	**0.8**
(6) Real expenditure growth	**3.7**	3.5	5.0	1.5	0.6	1.7	2.1	3.3	**2.7**
(7) Of which population growth	**1.5**	1.0	0.5	0.3	0.7	0.3	0.2	1.0	**0.7**
(8) Of which per person real expenditure growth	**2.2**	2.5	4.5	1.2	–0.1	1.4	1.9	2.3	**2.0**
(9) Share of health expenditure in GDP 1990[c]	**7.8**	9.5	8.8	8.3	7.3	8.6	6.0	12.2	8.6

(a) See text for details.

(b) West Germany only.

(c) This table follows the Australian convention of labelling Australian data for a financial year by the second year (that is, 1974–75 data are labelled 1975), whereas data for Australia in OECD publications are labelled by the first year (that is, 1974–75 data are labelled 1974). Note that data for non-Australian countries for health expenditure as a proportion of GDP is slightly inconsistent with some data in Table S50, due to inconsistencies in the OECD source document.

Sources: OECD 1993b; AIHW unpublished data

Health expenditure by States and Territories

In this section, 'State' is used to include the two Territories.

Statistics of health expenditure by State governments are available from a variety of central agency sources, including the ABS public finance database, State Health Authority annual reports, State Budget papers, and the Commonwealth Grants Commission (CGC).

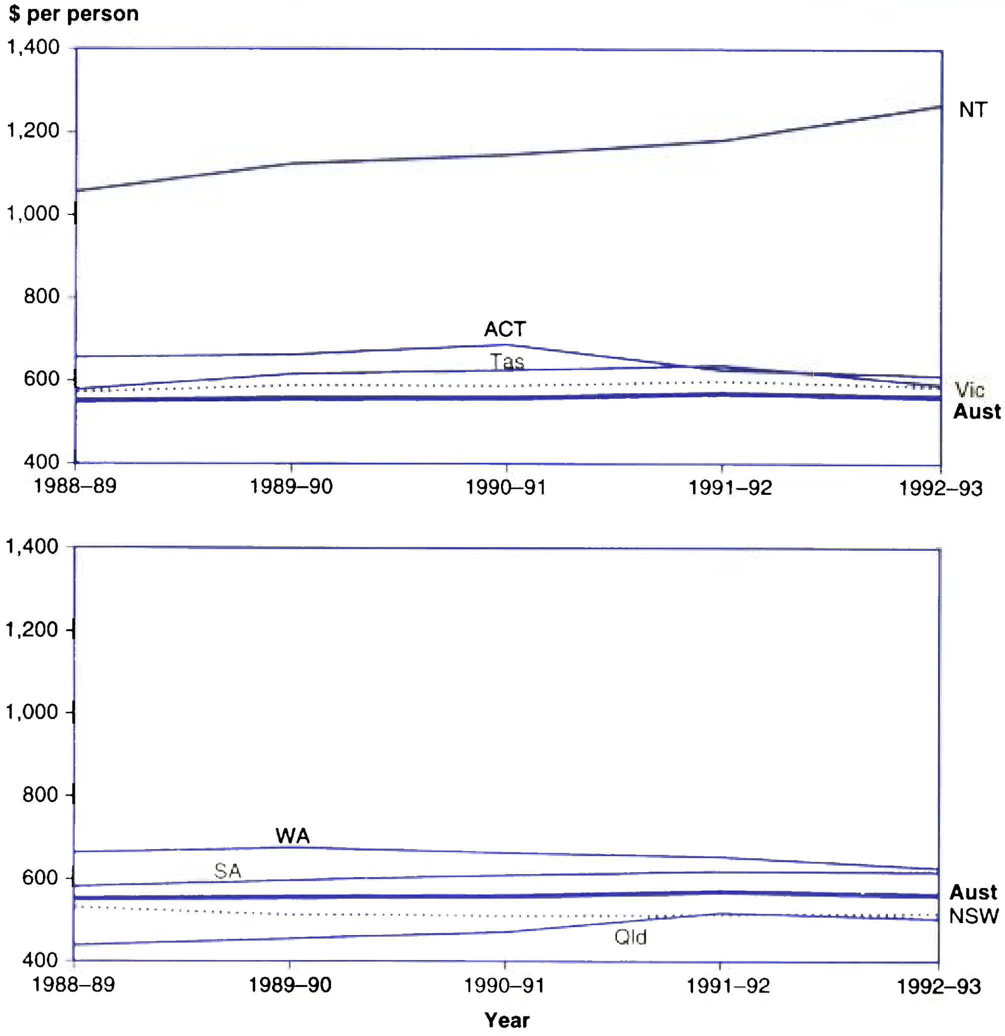
These bodies have adopted different practices for defining and measuring State health expenditure, resulting in differences in statistics reported at the State level. There is also a lack of detailed information. For example, the CGC database, one of the better databases on State health expenditure for recent years, includes Commonwealth grants to States, and reports recurrent expenditure but excludes capital expenditure and capital consumption (depreciation). Data presented by the Commission include standard, standardised and actual expenditure (see Box 3.2, page 124).

The National Health Information Agreement has a mandate to coordinate the bodies to define a standard set of definitions on agreed expenditure areas and to produce a uniform health expenditure data set.

State government recurrent health expenditure in constant 1989–90 prices increased 7.2% from $9.2 billion in 1988–89 to $9.9 billion in 1992–93 (CGC 1994).

Health expenditure as a proportion of total State government expenditure recorded by the CGC changed from 24.5% in 1988–89 to 23.3% in 1992–93.

Total State government health expenditure per person shows a 1.8% increase in real terms from $551 per person in 1988–89 to $561 in 1992–93, but there were considerable differences between States. The Queensland government increased real health expenditure per person by 15% over the period, from $439 per person to $504 per person, at an annual average rate of 3%. The Northern Territory increased its real health expenditure by 20%. Expenditure per person by Victoria, South Australia, and Tasmania increased by 2.4%, 6.2%, and 1.9% per annum respectively. Per person expenditure by New South Wales, Western Australia and the Australian Capital Territory fell in real terms by 3.0%, 5.4%, and 6.7% respectively (Figure 3.5).



Source: Commonwealth Grants Commission 1993b

Figure 3.5: ***State and Territory government total health expenditure, per person, 1988–89 to 1992–93 (constant 1989–90 prices)***

The relative order of State government real expenditure per person did not change significantly over the period. The Northern Territory Government had the highest expenditure per person, whereas the Victoria, New South Wales and Queensland Governments continued to have the lowest levels of expenditure.

Dispersion about the national average decreased significantly. In 1988–89 Queensland was 20% below the national average, but in 1992–93 it was only 10% below. Western Australia spent 20% above the national average in 1988–89 but only 12% above the national average in 1992–93.

If all States had moved to the Queensland per person level of health expenditure in 1988–89, State government expenditures would have been reduced by $1,800 million, whereas if that had happened in 1992–93 expenditure would have been reduced by only $1,100 million (in current prices).

Only the expenditures of the Queensland and New South Wales Governments lay below the national average throughout 1988–89 to 1992–93. The rest of the States spent more than the national average.

Hospital expenditure changes are very different from those of total recurrent health expenditure (Figure 3.6). Part of the apparent difference is likely to be due to classification differences between States.

From 1988–89 to 1992–93 there was a decrease in State government hospital expenditure per person for Australia. Real expenditure per person, net of patient fees and other revenue, fell by 1.3% over the period. The national average was heavily influenced by a decline in real hospital expenditure per person of 7% for New South Wales, from $401 per person to $350 over the period.

Cost of hospitals

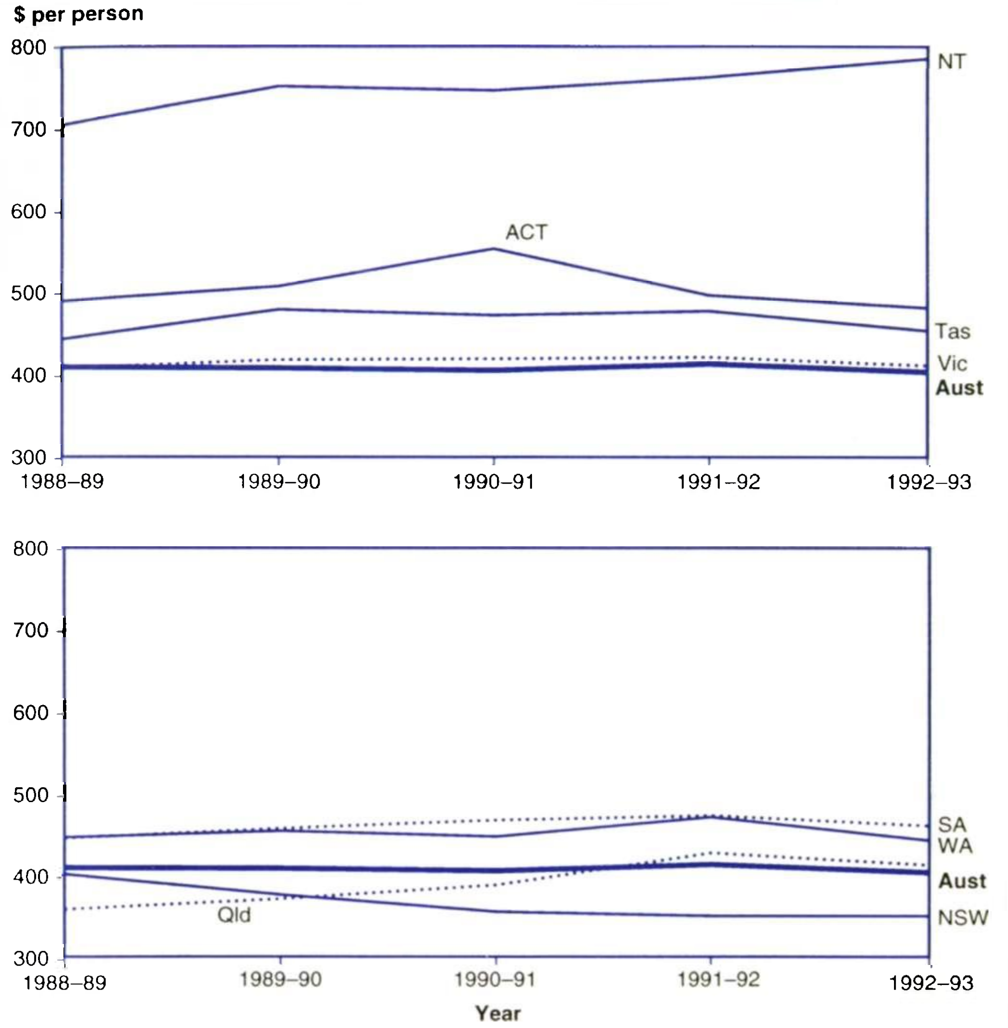
Total expenditure by acute care hospitals increased from $5,235 million in 1982–83 to $11,637 million in 1991–92, an increase of 122% (AIHW 1994). After taking inflation into account, the increase is 32% over 9 years or 3.1% per year. Growth in population was 1.5% per year over this period, so the real growth in per person expenditure was about 1.6% per year (Table 3.3, page 134).

During 1982–83 to 1991–92, total recurrent health expenditure grew faster than acute hospital expenditure. Total recurrent health expenditure grew from $19,439 million to $28,263 million (adjusted for inflation). Acute hospital expenditure, as a proportion of total recurrent health expenditure, fell from 42% to 38% despite a rise in the proportion of private hospital expenditure as a part of total health expenditure (Table 3.4, page 134).

Real expenditure for public hospitals increased by 26% from 1982–83 to 1991–92, whereas real expenditure for private hospitals increased by 68% over the same period.

Private acute and psychiatric hospitals had an estimated revenue in 1991–92 of $1,860 million. Of this, about 60% was expended on salaries, wages and on-costs such as superannuation, payroll tax and workers' compensation premiums.

The average expenditure per occupied bed-day, that is, the total cost for inpatient and non-inpatient services divided by the total number of occupied bed-days, was $400. This expenditure ranged from $285 for hospitals with 25 beds or fewer to $521 for hospitals with over 200 beds, but it must be recognised that larger hospitals frequently treat more resource-intensive conditions (Cooper-Stanbury, Solon & Cook 1994).



Source: Commonwealth Grants Commission 1993b

Figure 3.6: *State and Territory government hospital expenditure,per person, 1988–89 to 1992–93 (constant 1989–90 prices)*

The average cost per admission was $1,689 in private acute and psychiatric hospitals and $287 in the freestanding day hospitals.

Comparison of public and private hospital expenditure is problematic, because public and private hospitals have different roles and serve different populations. Public hospitals serve greater proportions of the old and the very young. The complexity of services provided to patients (casemix) varies between public and private hospitals: highly specialised services such as heart–lung transplants are provided by the public teaching hospitals, and less complex services are provided by both public and private hospitals. All freestanding day hospitals are private, but both public and private hospitals provide same-day surgery.

Table 3.3: *Total recurrent expenditure in acute hospitals,*[(a)] *current and constant 1989–90 prices, 1982–83 to 1990–91 ($ million)*

	Current prices			Constant 1989–90 prices			
Year	Public	Private	Total acute	Public	Private	Total acute	As % of GDP
1982–83	4,519	716	5,235	7,003	1,110	8,112	2.95
1983–84	4,878	803	5,681	7,120	1,172	8,292	2.84
1984–85	5,297	869	6,166	7,278	1,194	8,472	2.76
1985–86	5,784	969	6,753	7,512	1,258	8,770	2.75
1986–87	6,593	1,127	7,720	7,804	1,334	9,138	2.80
1987–88	7,249	1,216	8,465	8,138	1,365	9,503	2.77
1988–89	8,100	1,335	9,435	8,554	1,410	9,963	2.77
1989–90	8,736	1,540	10,276	8,736	1,540	10,276	2.78
1990–91	9,242	1,821	11,063	8,734	1,720	10,454	2.84
1991–92	9,613	2,024	11,637	8,833	1,860	10,693	2.88

(a) Acute hospitals includes recognised public, private and repatriation hospitals.

Source: AIHW Health Expenditure Data Base

Table 3.4: *Total recurrent expenditure in acute hospitals*[(a)] *and as a percentage of total recurrent health expenditure, constant 1989–90 prices, 1982–83 to 1990–91*

Year	Public hospitals	Private hospitals	All acute hospitals	Recurrent health expenditure
	(Per cent)	*(Per cent)*	*(Per cent)*	*($m)*
1982–83	36.0	5.7	41.7	19,439
1983–84	34.6	5.7	40.2	20,603
1984–85	34.2	5.6	39.8	21,271
1985–86	33.5	5.6	39.2	22,396
1986–87	33.2	5.7	38.9	23,490
1987–88	33.4	5.6	39.1	24,335
1988–89	33.2	5.5	38.6	25,796
1989–90	32.5	5.7	38.3	26,849
1990–91	31.8	6.3	38.1	27,425
1991–92	31.3	6.6	37.8	28,263

(a) Acute hospitals includes recognised public, private and repatriation hospitals.

Source: AIHW Health Expenditure Data Base

Analysis is further complicated by the way medical services are provided to patients. Public patients in public hospitals are provided with medical services by the hospital, at no expense to the patient. Private patients in both public and private hospitals pay for medical services by the treating doctor. The cost of these services is not recorded in the cost of the hospitals.

The different accounting rules for the public and private sectors further complicate comparison. For example, public hospitals generally do not estimate depreciation, but private hospitals generally do. Private hospitals which are run 'for profit' produce a profit (or a loss); the not-for-profit private hospitals may produce a surplus and the public hospitals produce neither a profit nor a surplus.

Services for non-admitted patients are another important area of difference. They make up 20% to 35% of the expenditure of public hospitals, but are a minor part of the services provided by private hospitals.

Expenditure on public hospitals is estimated from records of expenditure of State, Territory and Commonwealth health authorities. Expenditure on private hospitals is estimated from the revenue received from patient accommodation, theatre and other fees.

3.3 Private health insurance

The main source for this analysis is the Private Health Insurance Administration Council (PHIAC) database, from which the details of private health fund membership for basic and supplementary hospital insurance have been extracted. Other sources are the Australian Bureau of Statistics 1992 Health Insurance Survey (ABS 1993), the most recent survey of health care and insurance undertaken by TQA Research Pty Ltd (1991) and the background paper on private health insurance prepared by the National Health Strategy (Willcox 1991).

An industry in transition

The introduction of Medicare led to the private health insurance funds' share of health expenditure falling from 21.4% to 9.5%, but it has since recovered somewhat to 12.9% in 1992–93.

In 1982–83, prior to the introduction of Medicare, 32% of expenditure by private health insurance funds related to medical services. When Medicare was introduced in 1984, it took over this responsibility, so the private health insurance funds had to restructure and reorient their activities significantly.

The provision of hospital benefits has continued to be the main task of the private health insurance funds, and with the introduction of Medicare this increased from 47% to 57% of their expenditure. At the same time, funds put significant effort into promoting insurance for ancillary services, and for a short while insurance for these services did increase. Ancillary services represented 25% of expenditure in 1984–85 and 27% in 1985–86, but since then they have declined to be 22% of expenditure in 1992–93.

Administration costs increased from 10% of expenditure in 1982–83 to 14% in 1984–85, but since then the proportion has declined to 12% in 1992–93.

The activity of private health funds which has shown by far the greatest growth since 1984–85 has been benefits for patients in private hospitals, which have increased from 37% to 44% of expenditure and have shown a real growth of 116%. In contrast, benefits paid for private patients in public hospitals have declined from 20% of expenditure in 1984–85 to 14% in 1992–93.

Box 3.3: Private health insurance

Since the introduction of Medicare in 1984, private health insurance funds have not provided coverage of medical practitioner services outside hospitals. Private insurance now pays benefits principally for hospital services and for medical practitioner services received by private patients in both private and public hospitals. For this hospital cover, private insurance is available in two forms: basic and supplementary. Ancillary insurance covers all other health services, but accounts for only 22% of private health insurance benefits payments.

The basic hospital table provides full coverage for standard facilities for private inpatients of recognised public hospitals, and partial coverage for private hospitals and day hospital facilities. It also provides coverage of the gap between Medicare benefits and schedule fees for services received by private patients in both private and public hospitals.

The supplementary hospital tables provide additional hospital accommodation benefits to cover the higher charges of private hospitals and the extra charge for private rooms in public hospitals. Membership of a basic hospital table is a prerequisite for membership of a supplementary table.

The coverage of ancillary insurance varies from fund to fund, but typically includes dental, chiropractic, physiotherapy, dietetic and other services rendered by health professionals other than medical practitioners, and aids and appliances, especially spectacles, and ambulance services.

Changes to private health insurance arrangements were being canvassed as this edition of Australia's health went to press.

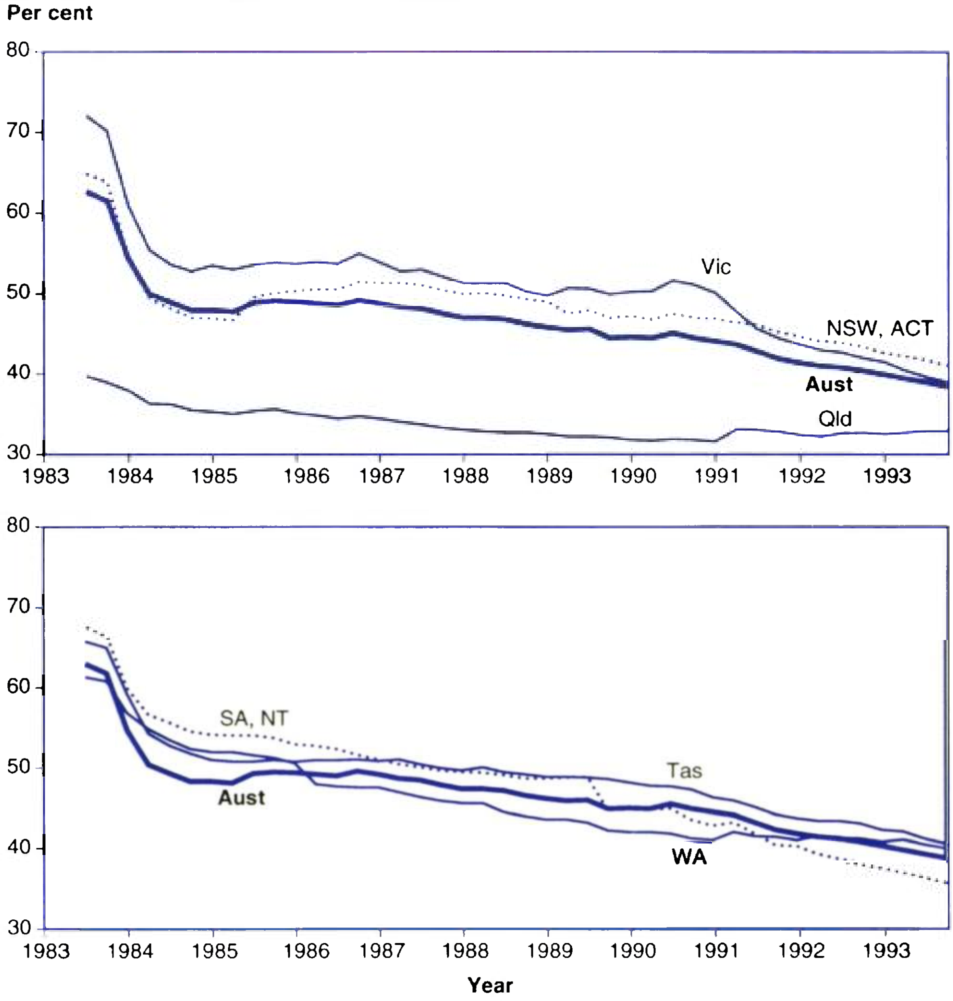
These changes in part reflect an increasing use of private hospitals, and a decreasing use of public hospitals, by privately insured patients. In the last three years, the number of private hospital bed-days has increased by 7%, and the number of public hospital bed-days for private patients has decreased by 15%.

Benefits paid per private hospital bed-day have increased 36% in real terms in the last three years, but much of the increase has been for increases in fees for theatre and other services rather than for accommodation charges. Over the same period, benefits paid per public hospital bed-day have increased by only 26%. The trend away from use of public hospitals, described in the previous paragraph, means that there has been a large increase in benefits paid per bed-day. This has been one reason for the large increases in premiums for private health insurance in recent years. In turn, the increases have affected coverage.

Trends in private hospital insurance coverage

The proportion of the population holding private hospital insurance has fallen from about 68% in 1982 (prior to the introduction of Medicare), to 50.0% in June 1984 and 38.4% in December 1993. The fall was rapid around the introduction of Medicare, but then slowed to 0.8 percentage points per year from June 1984 to June 1989 (Figure 3.7).

The decline over this period to June 1989 varied across States, with New South Wales experiencing only a small drop of 1.8%, partly offset by a temporary increase in coverage due to concerns arising from the doctors' dispute in 1984. In contrast, Western Australia and South Australia experienced declines of 11.3% and 7.9% respectively, whereas the lower rate of decline of 4.6% in Victoria was evidently influenced by concerns generated by the 1985 nurses' strike. The small decline of 4.1% in Queensland may reflect different historical experience; in Queensland, membership of health insurance funds has always been low because for decades the State government supplied public hospital services free to all.



Note: Separate data not available for ACT and NT.

Source: Private Health Insurance Administration Council unpublished data

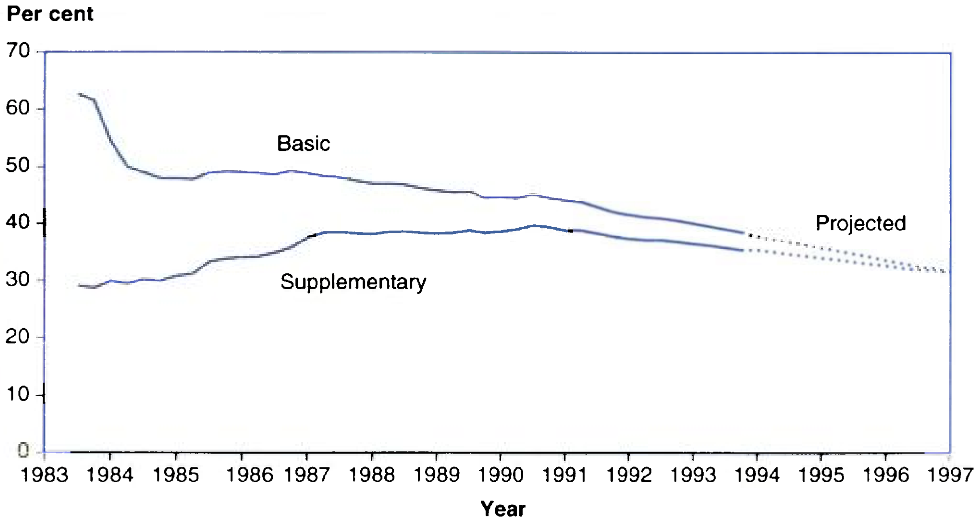
Figure 3.7: ***Proportion of population with basic private hospital insurance, States and Territories, 1983 to 1993***

From June 1989 to December 1993 the rate of decrease for Australia remained fairly steady at 1.6% per year, although some States experienced larger decreases. Coverage in Victoria fell from 50.8% to 38.9%, an average fall of 2.6 percentage points per year, and in South Australia from 48.5% to 35.6%, an average fall of 2.8 percentage points a year. Queensland experienced a small increase in coverage, of 0.7 percentage points over this period.

The result of these changes is that State levels of private hospital insurance cover have tended to converge, with an average dispersion about the national average of 5.8% in June 1984, decreasing to 2.4% in December 1993.

Marked geographical differences remain nevertheless, although the reasons are obscure. Hopkins & Kidd (1993) demonstrated the importance of geographic location as a factor independent of age, health status and income. The availability of private hospitals may partly explain the differences, especially between the non-metropolitan areas, where coverage is lower, and the metropolitan areas, where it is higher.

Supplementary cover membership has shown three main phases since the introduction of Medicare (Figure 3.8). The first phase was from June 1984 to June 1987, when the proportion of the Australian population with supplementary cover increased by 8.8 percentage points (from 29.6% to 38.4%), largely due to a 15.7 percentage points increase in New South Wales (from 22.6% to 38.3%). Victoria, Queensland and Western Australia also had significant increases, and there were small increases in South Australia and Tasmania.



Sources: Private Health Insurance Administration Council unpublished data, projections by AIHW

Figure 3.8: ***Proportion of population covered by health insurance funds basic and supplementary cover, 1983 to 1997***

In the second phase, from June 1987 to September 1990, the national proportion with supplementary cover increased by 1.3%, an average increase of 0.4% a year. This was the net result of increases in New South Wales and Victoria, stability in Queensland and South Australia, and declines in Western Australia and Tasmania.

Lastly, from September 1990 to December 1993 there was a decline of 4.4% in national supplementary cover (from 39.7% to 35.3% of the population), with variations from State to State. Victoria, South Australia and Tasmania had the biggest declines of, respectively, 10.2%, 6.2% and 5.6%. New South Wales had a decline of 3.8%. Western Australia had a small decline of 0.4%. There was an increase of 2.4% in Queensland. These variations are consistent with the recession experience of each of these States. Queensland and Western Australia weathered the recession best and, from September 1990 to December 1993, had significant employment growth, whereas the other States experienced employment declines (ABS 6203.0). Victoria had the most severe decline in employment in this period and also the largest decline in supplementary health insurance coverage.

The effects of price and income changes

The rapid increase in the price of health insurance over recent years may have contributed to the reduction in private hospital insurance membership. Of those who ceased private health insurance in the two years before a 1992 survey, 67% said they had done so because they could not afford it (ABS 1993).

A 1991 review noted: 'The price of health insurance has reached the "Pain Threshold" for many households...It has virtually become a "luxury" item over the past two years...The danger of cost increases driving people out of private health insurance is far greater now than it was two years ago...The number of respondents stating they are likely to opt out of private health cover in the next 12 months has increased by 50%. This is a grim forward indicator for the private health insurance market' (TQA Research 1991).

The TQA commentry implies that the high price of health insurance is causing the decline in membership, whereas the income falls due to the 1990–91 recession may be the major factor, particularly influencing the fall in supplementary membership. Other findings of TQA indicated that people with supplementary insurance were not very likely to abandon it because of changes in price. However, it has been argued that they are significantly influenced by changes in income. Thus, if income declines or is under threat of declining, some families will drop their health insurance coverage. The State differences in changes in supplementary coverage, discussed above, support this hypothesis.

If income is a major determinant of supplementary coverage, then, as the economy grows at a faster rate and employment starts to increase for all States, increases in supplementary coverage may be expected in all States. However, a return to pre-recession levels would not necessarily be expected, because some of those who drop private insurance will see no need to return, even though income improvement give them the capacity to return.

Figure 3.8 provides a forward projection of trends since December 1993 in health insurance membership for Australia. This projection shows a continued decline in both basic and supplementary private hospital insurance coverage to 31.1% in June 1997.

The decline in basic coverage is at an annual rate of 2.1%, and in supplementary coverage at 1.3% per year. As discussed above, membership of supplementary tables might increase as the economic recovery gathers pace.

Other factors influencing the level of private hospital insurance

The ABS Health Insurance Survey and other analyses continue to show that the prime determinants of demand for private health insurance are age, state of health, and material well-being. Declines in coverage among younger people continue, but coverage among those aged 60 and over has increased since 1986 (Table S52).

The 1992 ABS Health Insurance Survey asked why people had private health insurance (ABS 1993). With more than one reason allowed to respondents, the reason for having private hospital insurance was reported as 'choice of doctor' by 34% of contributor units, and 'allows use of private hospitals' by 31%. The proportion giving these reasons was lower than in the 1990 survey. In 1992, 31% of contributors gave their reason as 'shorter wait for treatment/concern over public waiting lists', and 43% sought 'security/protection/peace of mind'. These proportions had not changed greatly since 1990.

3.4 Pharmaceuticals

A summary of how the Pharmaceutical Benefits Scheme (PBS) operates in 1994 is given in Section 3.1. However, there have been many changes affecting the scheme in the period covered by this review.

The most important changes occurred on 1 November 1990. Until then, pensioners received PBS prescriptions free. Since then, pensioners, like other concessional beneficiaries, have had to pay for prescribed drugs, but have also benefited from the safety net arrangements applying to concessional beneficiaries. Again, on 1 November 1990, there was a substantial increase, from $11 to $15, in the maximum patient contribution for general beneficiaries. Since this date there have been changes to the safety net affecting general beneficiaries, and increases to $16 in their maximum patient contribution.

The timing of the November 1990 changes makes statistics for the financial year 1990–91 as a whole difficult to interpret, and this discussion is based on data from years during which there were lesser changes.

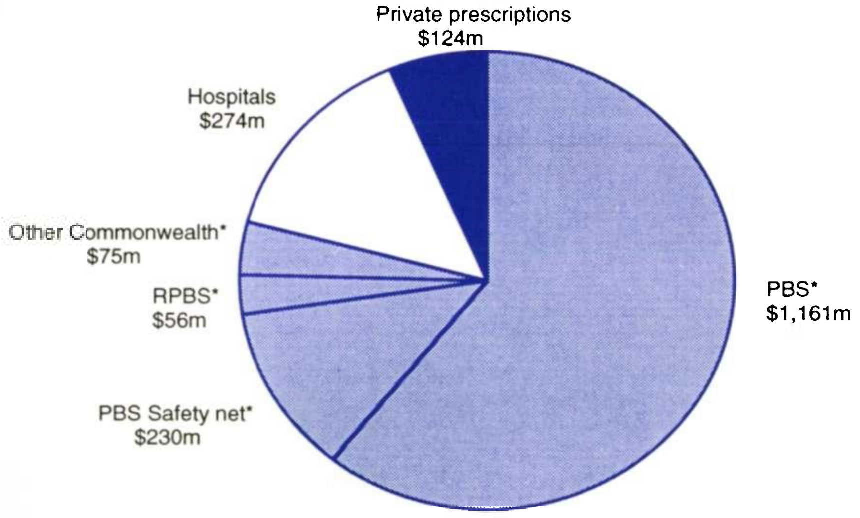
The information about pharmaceutical drugs provided on prescription through community pharmacies is of good quality. However, over the period examined, many drugs previously obtainable only by prescription from a medical practitioner or dentist have been made available without prescription. There are no data showing the effects of these changes and there is little information about the volume or composition of sales of non-prescription drugs (known as over-the-counter drugs or OTCs). Also, although amounts of public hospital spending on drugs are available, the breakdown between prescription drugs and OTCs is not available.

The Commonwealth also assists in provision and purchase of drugs through the Repatriation Pharmaceutical Benefits Scheme (RPBS), which provides assistance to specific groups of Australian war veterans and dependants, but is otherwise similar to the PBS for concessional beneficiaries.

Composition of the Australian market for prescription drugs

Prescription drugs can be dispensed under the PBS and RPBS programs, as private prescriptions, through hospitals, and through a group of smaller Commonwealth Government programs. Each of these segments has its own characteristics. Information about RPBS and subsidised PBS prescriptions comes from the Department of Human Services and Health, and the wholesaling and dispensing costs are known. The numbers of unsubsidised PBS prescriptions and of private prescriptions are provided by the Drug Utilisation Sub-Committee of the Pharmaceutical Benefits Advisory Committee, their information coming from a survey carried out in conjunction with the Pharmacy Guild of Australia; estimates of the prices of these drugs are provided on a confidential basis to the Institute by commercial sources. The costs of hospital drugs are collected through the Hospital Utilisation and Cost Studies carried out by the Institute, and adjusted to exclude estimated dispensing of non-prescription drugs.

Each market segment has its own mark-ups and dispensing costs and, for hospitals, dispensing costs and inventory costs are not known. The relative size of the different components of the prescription drug market can thus be obtained only by comparing the sales of drugs at manufacturers' prices. Figure 3.9 shows the components of this market in 1992–93.



* Commonwealth programs

Source: AIHW unpublished data

Figure 3.9: ***Total cost of manufacturers' prices of pharmaceutical (excluding OTC) drugs, 1992–93***

Between 1990–91 and 1992–93, the subsidised PBS sector grew from 57.5% to 60.5% of all drugs and the unsubsidised PBS sector from 10.7% to 12.5%. The hospital sector appears to have decreased a little; this could be due, in part, to the Commonwealth Government providing assistance to public hospitals for the provision of highly specialised drugs from 1991–92. The likely causes of these changes are discussed below.

Prescription drugs provided through community pharmacies

In 1992–93 community pharmacies supplied 157.5 million prescriptions to patients, an increase of 4% over 1991–92 (Table 3.5). Consumption per person was 8.84 prescriptions, down from the 1989–90 level of 9.54 prescriptions, but 2.7% higher than the 8.60 prescriptions in 1991–92.

Prescription use over this period was influenced by the changes from November 1990, but also by increases in the number of people eligible for PBS prescriptions as concessional beneficiaries.

Table 3.5: ***Estimated number of prescriptions supplied through community pharmacies, by category, 1989–90 to 1992–93 (million)***

Drug category	1989–90	1990–91	1991–92	1992–93
PBS – subsidised	105.0	95.7	93.5	105.3
Annual growth		*–8.8%*	*–2.4%*	*12.6%*
PBS – unsubsidised[(a)]	**33.2**	36.4	38.7	34.8
Annual growth		*9.6%*	*6.5%*	*–10.1%*
RPBS[(b)]	**7.6**	7.2	6.7	5.9
Annual growth		*–4.9%*	*–7.9%*	*–11.7%*
Private	**16.7**	15.3	12.2	11.6
Annual growth		*–8.4%*	*–20.5%*	*–4.9%*
Total number	**162.5**	**154.7**	**151.0**	**157.5**
Annual growth		***–4.8%***	***–2.4%***	***4.3%***

(a) PBS drugs priced less than the General Patient Contribution level for which no Commonwealth subsidy is paid, but which count towards the General Safety Net.

(b) Repatriation Pharmaceutical Benefits Scheme provides subsidised drugs to certain classes of veterans and their dependents. The numbers here include prescriptions supplied as Ordinary and Safety Net benefits.

Sources: Subsidised PBS and RPBS: DCSH 1990; DHHCS 1991, 1992; HHLGCS 1993 and unpublished data
Unsubsidised PBS and private prescriptions: Drug Utilisation Sub-Committee of the Pharmaceutical Benefits Advisory Committee; Pharmacy Guild of Australia; AIHW unpublished data

Like any other increase in charges, the increased costs of prescriptions for both pensioners and general beneficiaries could have been expected to reduce demand.

The numbers eligible for cards entitling their families to concessional benefits increased from 544,283 in 1990–91 to 730,505 in 1992–93. The increase in the numbers of people eligible for drugs at concessional prices was thus considerable. The increase in eligibility was due, in part, to increased unemployment. Poor health associated with unemployment might have led to an increase in the number of doctor visits and hence of prescriptions, and prescriptions becoming cheaper for new Concessional Card holders could have been expected to increase demand.

The number of prescriptions for which there was some subsidy fell by 11.5 million from 1989–90 to 1991–92. Subsidised prescriptions supplied as general benefits decreased by 7 million, in part because all prescriptions priced between $11 and $15 were no longer eligible for subsidy. The number of unsubsidised prescriptions for PBS items increased 5.5 million from 33.2 million to 38.7 million. In 1989–90, 7 million prescriptions priced between $11 and $15 had been purchased. The increase suggests that 5.5 million of them were still purchased in 1991–92.

The total number of prescriptions of PBS drugs increased from 132.2 million in 1991–92 to 140.1 million in 1992–93, an increase of 6.0%, or 4.5% per person. The number of subsidised PBS prescriptions increased from 93.5 million to 105.3 million, an increase of 12.6%. The number of unsubsidised prescriptions fell from 38.7 million to 34.8 million. The increased number of concessional beneficiaries would have been the main cause of this combination. As most new concessional beneficiaries would have been general beneficiaries first, all of their PBS drugs costing less than the general beneficiaries contribution would not have been subsidised at that time. As concessional beneficiaries, all their PBS drugs were subsidised.

These changes can also be seen in statistics of expenditure. Commonwealth PBS expenditure in 1992–93 was $1,418 million (Table 3.6). This was 23.3% higher than in 1991–92. Concessional Card holders who were formerly general beneficiaries increase Commonwealth expenditure even if their use of prescriptions does not change, and accounted for much of the 12.6% increase in the number of subsidised prescriptions (Table 3.5). That, in turn, implies a 9.5% increase in average costs of subsidised prescriptions. New use of higher cost drugs, and the replacement of cheaper drugs by higher cost drugs are the components of this increase in average cost per prescription; over $90 million was spent on the drug simvastatin, which lowers blood cholesterol levels, in 1992–93.

Table 3.6: ***Commonwealth and patient expenditure on pharmaceutical drugs, 1989–90 to 1992–93 ($ million)***

	1989–90	1990–91	1991–92	1992–93
PBS				
Commonwealth expenditure	1,135.5	1,094.5	1,132.5	1,417.5
Patient contributions	184.8	223.8	308.2	359.5
Total subsidised	1,320.3	1,318.3	1,440.7	1,777.0
Unsubsidised	331.7	436.2	441.2	428.0
Total PBS	1,652.0	1,754.5	1,881.9	2,205.1
RPBS	83.7	86.0	85.9	86.7
Private scripts	250.7	249.8	251.3	263.3
Total expenditure	**1,986.3**	**2,090.3**	**2,219.1**	**2,555.0**

Sources: Subsidised PBS and RPBS: DCSH 1990; DHHCS 1991, 1992; HHLGCS 1993 and unpublished data

Unsubsidised PBS and private prescriptions: Drug Utilisation Sub–Committee of the Pharmaceutical Benefits Advisory Committee; Pharmacy Guild of Australia; AIHW unpublished data

There appears to have been a significant reduction in the number of prescriptions for drugs not listed on the PBS over the period 1989–90 to 1992–93 (Table 3.5). These prescriptions had made up 10.3% of all prescriptions in 1989–90, but only 7.4% in 1992–93. It is not known whether drugs listed on the PBS have been prescribed instead.

Total expenditure on prescription drugs provided through community pharmacies in 1992–93 was $2,555 million, an increase of 15.1% over 1991–92. A 10.4% increase in average prescription costs contributed more to this than the 4.3% increased use of prescriptions (2.8% per person). The Commonwealth paid $1,504 million of the $2,555 million through the PBS and RPBS, and individuals paid $1,051 million (41%), including amounts for non-PBS drugs.

If the increase in the numbers of cardholders over the period 1990–91 to 1992–93 is due to unemployment, then it is likely that Commonwealth expenditure through the PBS has increased by $100–150 million as a result of the increase in unemployment.

Other Commonwealth programs for provision of pharmaceutical drugs

Other major components of Commonwealth expenditure on pharmaceutical drugs are shown in Table 3.7.

Table 3.7: ***Other Commonwealth programs for the provision of pharmaceutical drugs, expenditure 1989–90 to 1992–93 ($'000)***

Component	1989–90	1990–91	1991–92	1992–93
Growth hormone	36,548	42,627	40,272	35,712
Highly specialised drugs	na	na	32,602	34,544
Doctor's bag	(a)	12,256	14,729	16,279
Other	7,304	9,917	13,274	14,987
Total	**43,852**	**64,800**	**100,877**	**101,522**

(a) Doctor's bag drugs included in PBS general benefits up to 1990–91.

Sources: DCSH 1990; DHHCS 1991, 1992; HHLGCS 1993

The largest item of expenditure in 1992–93 in this group was for growth hormones, which are supplied free through doctors, mainly paediatricians. The amount spent on this program has declined somewhat and additional restrictions on use of hormones were introduced in the 1993 budget.

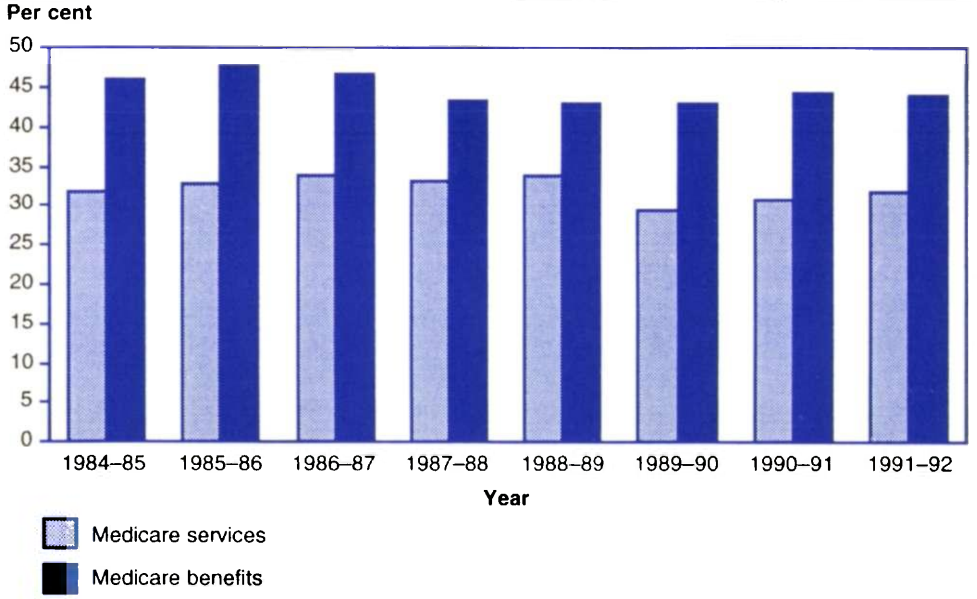
The 'highly specialised drugs' program provides drugs for the treatment of non-inpatients attending public hospitals. The drugs provided under this program include drugs for patients who have had organ or tissue transplants, and for patients with HIV infection and AIDS.

Doctor's bag items are emergency supplies used by doctors and provided through community pharmacists. Prior to 1990–91, their cost was included with that of general PBS benefits.

3.5 Health technologies

Health care technologies pervade all areas of the prevention and treatment of disease and disability. Although their use has significant cost implications for the allocation of health care resources, the expenditure on them in Australia is not definitely known, although it is certainly substantial. This uncertainty results from difficulties in defining 'health technologies'. No matter how they are defined, data on expenditure are incomplete, particularly for services not funded through Medicare benefits or as pharmaceutical benefits.

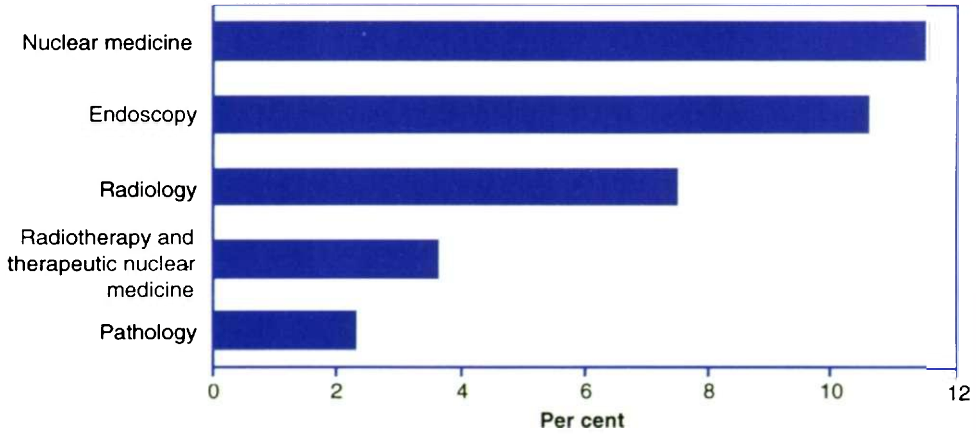
For this discussion, technology services are defined as pathology, radiology, ultrasound, nuclear medicine, endoscopy and other diagnostic services, radiotherapy, laser use, laparoscopic surgery, operations for cataract, lithotripsy, and insertion of cardiac pacemakers. Together they accounted for 32% of total Medicare services and 44% of total Medicare benefits paid in 1991–92 (AIHW 1993b). Figure 3.10 shows how these percentages have changed since 1984–85; the drop between 1988–89 and 1989–90 in percentage of services reflects changes in the schedule of pathology services. As significant proportions of expenditure on some service categories such as nuclear medicine and radiotherapy services are not funded under Medicare, the proportion of expenditure on these technologies is an underestimate.



Source: AIHW unpublished data

Figure 3.10: ***Technology services as a percentage of total Medicare services and benefits, 1984–85 to 1991–92***

Although there have been only comparatively minor changes to the percentage of total Medicare benefits paid for health technology services, Figure 3.11 shows that there has been considerable growth in the numbers of some services. Further data are given in Table S58, page 296.



Source: AIHW unpublished data

Figure 3.11: ***Average annual growth rate for some categories of diagnostic technology, 1984–85 to 1991–92***

Expenditure on health information technologies is also uncertain, but increasing, with the prospect of substantial expansion in the near future. Neame (1993) has suggested that perhaps 5% of the total health budget, that is, $1,500 million annually, might be spent on information technology.

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statistics on people with a health qualification include those who reported a health field as the field of study of their highest qualification.

Growth in the numbers of people who reported a health qualification as their highest qualification greatly outstripped population growth in the period between the 1986 and 1991 censuses. The largest increases were in psychiatry (103.9%), radiology (109.6%), radiography (93.5%), and optometry (161.5%). There was a 15.8% reduction in the numbers reporting their highest qualification as being in surgery (Table 4.4).

Table 4.4: *Persons with selected health qualifications,*[(a)] *1986 and 1991 censuses*

	1986		1991		1986–1991
Type of qualification	**Persons**	**% female**	**Persons**	**% female**	**% change**
Medicine					
General and internal	28,730	26	37,220	32	+29.6
Surgery	3,850	8	3,240	10	–15.8
Psychiatry	760	28	1,550	34	+103.9
Obstetrics and gynaecology	750	23	1,170	32	+56.0
Anaesthesiology	920	17	1,460	22	+58.7
Pathology	810	43	950	45	+17.3
Radiology	520	20	1,090	33	+109.6
Other(b)	3,250	43	3,520	36	+8.3
Nursing	283,930	95	332,710	94	+17.2
Dental science	7,830	17	10,480	28	+33.8
Pharmacy	15,560	43	17,870	49	+14.8
Physiotherapy	8,210	87	10,630	84	+29.5
Radiography	3,700	67	7,160	70	+93.5
Occupational therapy	3,850	95	5,450	96	+41.6
Speech pathology	1,830	95	2,520	97	+37.7
Optometry	1,920	25	5,020	26	+161.5
Total	**366,420**	**83**	**442,040**	**82**	**+20.6**

(a) Highest field of qualification reported in census.

(b) Includes specialist qualifications not elsewhere classified or undefined.

Sources: AIHW unpublished data; ABS Cat. No. 2731.0

Employment trends

For the larger health professions, the census provides data on levels of and trends in employment which are useful in assessing concerns about oversupply or shortages, and the numbers of students and overseas-trained practitioners.

Data for the censuses from 1971 to 1991 show that there has been strong growth in the total number of people employed in health occupations. However, the level of growth between censuses has declined steadily, from 30.9% during 1971 to 1976, to 7.2% during 1986 to 1991. This is a more sustainable long-term growth rate as it is similar to population growth (Table 4.5).

The largest health profession is nursing. This has experienced a slower rate of growth than other professions, mainly because of restructuring of the hospital sector which has seen a decrease in hospital employment and the move of nurse education from

Table 4.3: *Medical practitioners billing for at least one Medicare service, by major specialty,*[(a)] *1986–87 and 1991–92*

Major specialty	1986–87	1991–92	Per cent increase 1986–87 to 1991–92
General practitioners	19,411	22,962	18.3
Anaesthetist			
Specialist	1,369	1,656	21.0
Non-specialist	63	112	77.8
Dermatologist	222	242	9.0
Obstetricians and gynaecologists	849	930	9.5
Pathologist[(b)]			
Specialist	490	588	20.0
Non-specialist	95	104	9.5
Imagist[(b)]			
Specialist	895	1,063	18.8
Non-specialist	97	109	12.4
Radiation oncologist	80	106	32.5
Surgeon			
Specialist	3,076	3,365	9.4
Non-specialist	467	794	70.0
Physician			
Internal medicine	2,467	3,158	28.0
Psychiatrist	1,173	1,438	22.6
Other medical[(c)]	245	274	11.8
All specialties, excluding GPs	11,588	13,939	20.3
All specialties	**30,999**	**36,901**	**19.0**

(a) Major specialty in each year was determined with regard to the nature of the service rendered by each practitioner and the fields of specialist recognition that the practitioner had under Medicare. Practitioners exclude those salaried medical officers in public hospitals who did not have a Medicare provider number.

(b) In many cases will relate to the claiming provider.

(c) Practitioners who could not be more precisely classified.

Source: DHHCS 1992

These growth rates differ substantially from those observed between the 1986 and 1991 censuses—7.0% for general practitioners and 48.0% for specialists—although the overall rate of growth in the number of medical practitioners, 18.3% for the census and 19.0% for Medicare, are similar. The difference is due to the self-reporting process in the census and the classification system used. In the Medicare data, specialty is determined by the nature of the services rendered and the specialist recognition that the practitioner had.

The highest growth rates for Medicare providers occurred for radiation oncologists (32.5%), specialists in internal medicine (28.0%), psychiatrists (22.6%) and specialist anaesthetists (21.0%).

People with health qualifications

In both 1986 and 1991 the census question on qualifications asked for the name, institution, field of study and year of the highest qualification attained. Therefore, from 94% to 92%, and of female physiotherapists from 84% to 80%. Excluding nurses and physiotherapists, the average percentage of females increased from 42% to 47%.

Table 4.2: *Selected health occupations, 1986 and 1991 censuses*

	1986		1991		1986–1991
Occupation	**Persons**	**% female**	**Persons**	**% female**	**% change**
Health occupations					
Medical practitioners					
General practitioners	23,790	25	25,450	30	+7.0
Specialists	9,000	16	13,350	25	+48.3
All medical practitioners	32,790	23	38,800	29	+18.3
Dentists	6,310	14	6,720	17	+6.5
Pharmacists	10,640	39	10,880	43	+2.3
Physiotherapists	5,930	84	7,120	80	+20.1
Radiographers	4,270	63	4,760	66	+11.5
Occupational therapists	2,770	93	3,660	94	+32.1
Speech pathologists	1,320	96	1,750	97	+32.6
Optometrists	1,470	22	1,820	29	+23.8
Chiropractors and osteopaths	1,370	15	1,540	19	+12.4
Podiatrists	980	69	1,140	66	+16.3
Other diagnosis and treatment practitioners	3,880	69	5,540	76	+42.8
Nurses					
Enrolled	35,220	94	39,670	92	+12.6
Registered	138,220	92	139,380	92	+0.8
Dental	8,800	99	9,590	99	+9.0
All nurses	182,240	93	188,640	93	+3.5
All health occupations	**253,980**	**76**	**272,370**	**78**	**+7.2**
Health-related occupations					
Psychologists	3,850	56	4,750	61	+23.4
Social workers	6,370	75	7,170	78	+12.6
Counsellors	4,490	63	7,890	67	+75.7
Medical testing professionals	7,780	52	7,430	55	–4.5
Medical technical officers and technicians	7,570	71	9,760	74	+28.9
Ambulance officers	5,100	4	5,580	9	+9.4
All health-related occupations	**35,160**	**55**	**42,580**	**60**	**+21.1**
All health and health-related occupations	**289,140**	**73**	**314,950**	**75**	**+8.9**

Sources: ABS Cat. Nos. 2731.0 and 4346.0

The Medicare database on active Medicare providers includes all medical practitioners who provided at least one service claimed under Medicare during each financial year, and covers more than 90% of all medical practitioners. Medicare database statistics show an 18.3% increase for 1986–87 to 1991–92 in the number of general practitioners, to 22,962, and a 20.3% increase in the number of medical practitioners providing predominantly specialist services, to 13,939 (Table 4.3).

health services, and the growth of the aged population affects demand for these services.

Table 4.1: *Persons employed in the health industry, 1986 and 1991 censuses*

	1986		1991		1986–1991
Health industry	**Persons**	**Per cent**	**Persons**	**Per cent**	**% change**
Hospitals (excl. psychiatric)	228,270	50.5	205,360	42.6	–10.0
Psychiatric hospitals	18,730	4.1	14,000	2.9	–25.3
Nursing homes	67,570	15.0	76,000	15.7	+12.5
Hospitals, nursing homes undefined	3,300	0.7	18,960	3.9	na
Medicine	64,960	14.4	73,420	15.2	+13.0
Dentistry, dental laboratories	22,350	4.9	23,720	4.9	+6.1
Optometry	5,250	1.2	7,060	1.5	+34.5
Ambulance services	6,200	1.4	6,470	1.3	+4.4
Community health centres	13,650	3.0	17,340	3.6	+27.0
Other[(a)]	21,590	4.8	40,279	8.3	+86.6
All health industries	**451,870**	**100.0**	**482,609**	**100.0**	**+6.8**

(a) Includes health industry not defined or not elsewhere included.

Sources: ABS Cat. Nos. 2731.0 and 4346.0 and unpublished data

At the 1986 census, 47.5% of health industry employment was in the private sector. By the 1991 census, this had increased to 51.9%, following a 2.1% fall in government sector employment and a 16.8% increase in private sector employment.

Employment in government hospitals and nursing homes fell by 7.1% (14,800 people) to 196,300, and that in the private sector grew by 11.0% (11,700 people) to 118,000. There was a 5.5% decrease in government sector employment of doctors and a 13.9% increase in the private sector. Similarly, dentists experienced a 5.1% decrease in public sector employment and a 11.5% growth in employment in the private sector.

Employment in selected health occupations

The 1991 census found that there were 272,370 people employed in health occupations, representing 3.9% of all employed people. This percentage was unchanged from the 1986 census.

There were 188,640 nurses, 38,800 medical practitioners, 10,880 pharmacists and 6,720 dentists providing health services in 1991 (Table 4.2, page 150). These figures exclude practitioners whose employment was mainly in management, education, or research, or in other fields not providing clinical services.

Health occupations with low growth included registered nurses (0.8%), dentists (6.5%), and pharmacists (2.3%). High growth occupations included medical practitioners (18.3%), enrolled nurses (12.6%), physiotherapists (20.1%), radiographers (11.5%), occupational therapists (32.1%), speech pathologists (32.6%), optometrists (23.8%), chiropractors and osteopaths (12.4%), and podiatrists (16.3%) (Table 4.2).

The percentage of females in health-related occupations increased from 1986 to 1991, except in nursing and physiotherapy: the percentage of female enrolled nurses fell

4 Health care resources and their use

4.1 Health personnel

Census data help to resolve many of the health labourforce issues that are important in Australia, such as:

- appropriate numbers of health professionals required;
- labourforce requirements and supply in various health professions, and specialties within those professions, both across Australia and within geographic regions;
- quotas for students undertaking tertiary training to meet future labourforce needs;
- requirements for maintenance and upgrading of skill levels of health professionals, and the retraining needs of qualified professionals re-entering the labourforce after an absence;
- use of overseas-trained health professionals to meet short-term and long-term needs;
- requirements for increasing uniform regulation and mutual recognition processes to achieve efficiencies in professional mobility which would assist in addressing health labourforce distribution problems; and
- recognition of changing professional roles within the health care system.

For many of the smaller health occupations, the census is the only source of national data on the numbers working in those occupations. For all health occupations, it provides a measure of the numbers of people qualified in the occupation who are either not working or are working in another occupation.

There are, however, limitations on the usefulness of the census data. Full coverage is not achieved because of people missed in the census enumeration, and non-response to the occupation, qualification and industry questions. The census records only a person's highest qualification, so that a health professional with a highest qualification in another field might be reported as not being in a health occupation: an example is a hospital manager with professional qualifications but who also has a higher qualification in management.

Employment in the health industry

People employed in the health industry, enumerated in the 1991 national census, totalled 482,609, an increase of 6.8% from the 1986 census total of 451,870. Between the two censuses, employment for all industries grew by 7.7% and the population grew by 8.0%. There was a reduction of 10.0% in employment in non-psychiatric hospitals which was offset by growth in employment in nursing homes (12.5%), community health centres (27.0%) and other areas of the health industry (86.6%) (Table 4.1.).

These changes may be partly explained by a 15% increase in the population aged 65 and over and an 18.2% increase in the population aged 75 and over from 1986 to 1991. The aged and frail aged are major users of both institutional and community care

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hospitals to tertiary institutions. Between the 1986 and 1991 censuses, growth in the number of nurses was 3.5%; previously it had been much higher. The number of employed nurses per 100,000 population fell from a census peak of 1,168 in 1986, to 1,120 in 1991.

Table 4.5: *Persons employed in health occupations, 1976, 1981, 1986 and 1991 census*

Health occupation	1976	1981	1986	1991
		Number		
Medical practitioners	21,150	28,010	32,790	38,800
Dental practitioners	4,550	5,490	6,310	6,720
Other health practitioners[(a)]	21,080	27,020	32,640	38,210
Nurses	136,000	159,190	182,240	188,640
All health occupations	**182,600**	**219,810**	**253,970**	**272,370**
All employed persons	5,788,150	6,292,630	6,513,520	7,017,867
		% change from previous census		
Medical practitioners	+27.2	+32.5	+17.0	+18.3
Dental practitioners	+33.2	+20.6	+14.9	+6.5
Other health practitioners[(a)]	+32.1	+28.2	+20.9	+17.1
Nurses	+31.4	+17.0	+14.5	+3.5
All health occupations	**+30.9**	**+20.4**	**+15.5**	**+7.2**
All employed persons	+10.5	+8.7	+3.5	+7.7
		Rate per 100,000 population		
Medical practitioners	156.1	192.2	210.2	230.3
Dental practitioners	33.6	37.7	40.4	39.9
Other health practitioners[(a)]	155.6	185.4	209.2	226.8
Nurses	1,003.8	1,092.1	1,168.0	1,119.5
All health occupations	**1,347.0**	**1,508.0**	**1,627.8**	**1,616.4**
All employed persons	42,721.9	43,170.2	41,747.6	41,647.7

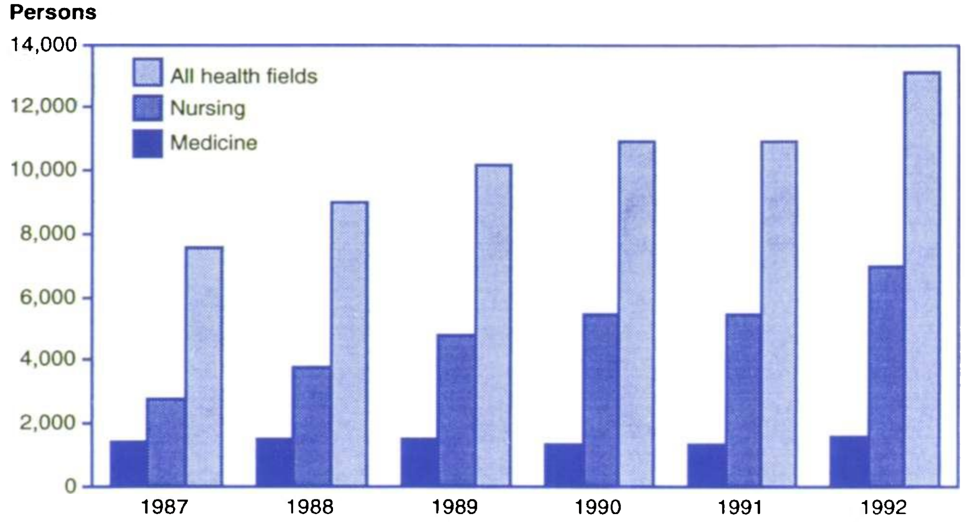
(a) Includes pharmacists, occupational therapists, optometrists, physiotherapists, speech pathologists, chiropractors and osteopaths, podiatrists, radiographers and other health diagnosis and treatment practitioners.

Sources: ABS Cat. Nos. 2731.0 and 4346.0 and unpublished data

In contrast, the number of medical practitioners continued to grow strongly, and this has led to concerns of oversupply, particularly of general practitioners in the capital cities, although there are shortages in some rural and remote areas. The number of medical practitioners per 100,000 population increased from 156 in 1976 to 230 in 1991.

Education and training of health personnel

The number of students completing tertiary courses in health disciplines annually has grown steadily from 7,596 in 1987 to 13,145 in 1992 (Figure 4.1). Most of this increase has occurred in nursing, from 2,756 completing nursing in 1987, to 7,027 in 1992. This has been due to the phasing-in of tertiary institution-based nurse training in place of hospital-based training, a process which began in 1984. A review of nurse education during 1993–94 will recommend measures to improve the effectiveness of nurse education in providing wider professional preparation and career choices for nurses.



Source: Department of Employment, Education and Training unpublished data

Figure 4.1: *Students completing tertiary professional health courses in Australia, 1987 to 1992*

Total new enrolments in health courses increased from 24,193 in 1991 to 24,900 in 1992, a 2.9% increase. There was substantial growth in the number of full-fee-paying overseas students in nursing, from 313 to 635 students. This accounted for most of the 47% increase from 863 to 1,269, in full-fee-paying overseas students undertaking health courses (Table 4.6).

Table 4.6: *Commencing tertiary enrolments (excluding non-award) in health fields, 1992*

Health field	Full-fee-paying overseas students	All other students
Podiatry	1	96
Optometry	5	214
Dietetics	20	244
Dentistry	31	241
Speech pathology/Audiology	3	358
Radiography	7	232
Pharmacy	79	555
Occupational therapy	20	670
Physiotherapy	40	808
Medicine[a]	261	2,144
Other health fields	167	4,272
Nursing[a]	635	13,797
All health fields	**1,269**	**23,631**

(a) Includes undergraduate training and postgraduate specialist training.

Source: Department of Employment, Education and Training unpublished data

4.2 Institutional facilities

In 1991–92 there were 713 public acute hospitals, 294 private acute hospitals, 72 (all private) freestanding day hospital facilities, 45 public psychiatric hospitals, 25 private psychiatric hospitals, 1,444 nursing homes, and 1,198 hostels in Australia (Table 4.7).

Table 4.7: *Institutions and available beds, 1985–86 to 1991–92*

Institution type	1985–86	1987–88	1989–90	1991–92
Institutions				
Hospitals				
Public acute(a)	**751**	723	690	713
Private acute(b)	**332**	331	329	319
Public psychiatric	48	39	59	(c)45
Aged nursing homes(d)	1,410	1,429	1,437	1,444
Hostels	851	987	1,021	1,198
Available beds(e)				
Hospitals				
Public acute(a)	64,692	64,465	61,066	57,053
Private acute(b)	21,101	21,568	21,733	20,745
Public psychiatric	12,741	8,620	8,513	7,266
Aged nursing homes(d)	72,168	72,116	72,615	74,039
Hostels	39,816	43,004	44,470	49,194
Nursing home:hostel ratio	64:36	63:37	62:38	60:40
Available beds (per 1,000 population)(e) (f)				
Hospitals				
Public acute(a)	**4.1**	3.9	3.7	**3.3**
Private acute(b)	**1.3**	1.3	1.3	**1.2**
Public psychiatric	**0.8**	0.5	0.5	**0.4**
Aged nursing homes(d)	64.9	61.4	58.5	56.3
Hostels	35.8	36.6	35.8	37.4

(a) Includes Department of Veterans' Affairs General and Auxiliary hospitals. Queensland outpatient clinics aggregated with associated hospitals in 1985–86, 1987–88 and 1989–90. Queensland clinics were not aggregated in 1991–92. The 1985–86 data include approximately 19 Western Australian nursing posts which have been excluded from later years.

(b) Private hospitals include private psychiatric hospitals and exclude freestanding day hospital facilities.

(c) Excludes numbers of institutions in NSW which are not predominately psychiatric hospitals, but have psychiatric programs.

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

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

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

Sources: Mathers & Harvey 1988; Gillett et al. 1991; Gillet & Solon 1992; Cooper-Stanbury, Solon & Cook 1994; DHHCS 1991; ABS Cat. No. 4390.0

A more important indicator of the supply of health care facilities is the number of beds per 1,000 population (bed ratio), provided the beds are available to be filled (see Box 4.1, page 156). This section examines recent trends in the availability of beds, as indicated by the bed ratio.

Box 4.1: Statistics relating to institutional facilities

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

Even counting institutions poses problems. For example, a hospital with an attached nursing home may be counted as two institutions, whereas multiple but geographically separate facilities administered by a single board of management may be counted as a single institution.

The number of beds available to be filled per 1,000 population,is a better measure of the provision of health care facilities than the number of facilities, but counting hospital beds is also not simple. The concept of an 'available bed' is commonly used, but until recently there has been no universally accepted definition, so it has been difficult to compare State, regional and international provisions.

To address this problem, AIHW, in consultation with other interested bodies, has developed a set of recommended definitions for use in hospitals and related institutions. The National health data dictionary—institutional health care *(AIHW 1993b) provides a set of data items and definitions to enable the collection of uniform data to describe and compare institutional health care services throughout Australia. The definition of available beds from this dictionary is given in full to illustrate the detailed consideration needed for production of comparable statistics:*

Available beds

For acute and psychiatric hospitals the number of beds which are immediately available to be used by admitted patients or residents if required. They are immediately available for use if located in a suitable place for care, and there are nursing and other auxiliary staff available, or who could be made available within a reasonable period, to service patients or residents who might occupy them. The average number of beds should always be shown as a whole number. Exclude surgical tables, recovery trolleys, delivery beds, cots for normal neonates, emergency stretchers/beds not normally authorised or funded and beds designated for same-day non-inpatient care.

Beds in wards which were temporarily closed due to factors such as renovations or strikes but which would normally be open and therefore available for the admission of inpatients should be included in 30 June financial year-end figures but for average bed numbers, beds in wards which were closed for any reason (except weekend closures for beds/wards staffed and available for five days per week) should not be included. Numbers to be provided as an average for the year and also at a point in time (year-end figures). The average to be calculated from monthly figures where available (if not, basis is to be stated).

The ratio of available beds to population is a useful statistic for measuring the supply of institutional health care. Ideally, available beds should be counted in an annual census, but until recently there have been no guidelines relating to counting them.

In 1985–86, following a rapid reduction earlier in the 1980s in length of hospital stay, the States and Territories were planning to reduce their acute hospital bed ratios from between 3.9 and 6.4 beds per 1,000 population, to between 3.25 and 5.0 (Mathers & Harvey 1988). By the end of the decade, some authorities had achieved their targeted reductions in bed ratios, but others still had some way to go.

Excluding beds in freestanding day hospital facilities and in public psychiatric hospitals, there were 4.5 hospital beds available for acute care per 1,000 population in Australia in 1991–92. This followed a steady decline during 1985–86 to 1991–92, mainly in the public sector where the ratio of available beds fell by an average of 4% a year, from 4.1 to 3.3 beds per 1,000 population (Table 4.7). Over most of this period, the supply of private sector hospital beds remained at 1.3 beds per 1,000 population, although in 1991–92 this, too, dropped to 1.2 beds per 1,000 population.

The most recent data available (for 1990) indicate that Australian acute hospital bed ratios were high compared with those of many OECD countries, although accurate comparison was difficult. Compared with an Australian ratio of 5.0 beds per 1,000 population in 1989–90, the United States had 3.8, Canada 4.5, the Netherlands 4.3 and Norway 4.2. However, some European OECD countries had higher ratios—Switzerland 6.5 and Germany 7.3 (OECD 1993). Australian acute hospitals, especially country hospitals, provide care for patients who could be accommodated in nursing homes, whereas this is not the case in many other health systems.

The number of beds available in public psychiatric hospitals in Australia decreased from 2.3 per 1,000 population in 1970 to 0.4 in 1991–92. During the 1970s and early 1980s, the supply contracted by 6% per year (Mathers & Harvey 1988). Then, between 1985–86 and 1987–88, the annual rate of decrease was 21%. This rapid reduction in beds resulted from moves to de-institutionalise patients requiring both acute and long-term psychiatric care. Since 1987–88, the reduction in bed supply has continued at an average of 6% a year.

In 1991–92 there were 20,745 available beds in private acute and psychiatric hospitals, and 556 beds, chairs, recliners, and so on in freestanding day hospitals. Of these beds, 76% were located in capital city hospitals.

The average number of full-time equivalent staff was 31,527, with 60% being nurses, mainly registered and enrolled nurses.

Throughout the 1970s and early 1980s, the numbers of nursing home beds per 1,000 population increased slowly (Mathers & Harvey 1988). The structure of residential care was then reshaped by the application in 1985 of a planning ratio of 40 nursing home beds and 60 hostel places for each 1,000 people aged 70 years and over, on a regional basis. A decline in nursing home bed ratios, of 2.6% per year, from 64.9 beds per 1,000 population aged 70 years and over in 1985–86, to 58.5 in 1989–90, followed. More recently, the rate of decrease has slowed to 1.9% per year, with 56.3 nursing home beds available per 1,000 aged people in 1991–92 (Table 4.7).

Hostels provide long-term accommodation, combined with a basic level of health care, for young disabled and the frail aged. The planning ratio for hostel places was originally 60 hostel places for each 1,000 people aged 70 years and over, but in 1991 it was reduced to 55 beds per 1,000 people aged 70 years or over.

Between 1985–86 and 1991–92, the number of hostel beds increased continuously, but because of increases in the numbers of people 70 and over, the bed ratio per 1,000 people increased slightly, resumed its former level, then increased again. By 1991–92, hostel bed numbers had reached 49,194, representing an increase of 4% per year since 1985–86. The hostel bed ratio in 1991–92 was 37.4 beds per 1,000 people aged 70 and above.

The changes in nursing home and hostel bed supply were thus influenced by the Commonwealth Government's policy of accommodating older people who are less frail in hostels rather than in nursing homes. As well as making these changes, the Commonwealth Government has been placing greater emphasis on community care for frail aged people.

Regional variations in bed supply

Within the public sector the decline in numbers of beds per 1,000 population was greatest in those States and Territories where the bed supply had been greatest (Table 4.8). For example, in Tasmania w1here the number of beds was 15% above the national average in 1985–86, the decline was 5% per year. By 1991–92 the bed supply in Tasmania had declined to 9% above the national average. Of the States which had more than the average number of beds per 1,000 population, South Australia alone experienced a below-average decline in bed numbers, of 3% per year, leaving it as the State with the highest per capita bed supply in the public sector in 1991–92.

Table 4.8: *Acute public hospital beds*[(a)] *per 1,000 population, States and Territories, 1985–86 to 1991–92*

Year	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
1985–86	**4.1**	3.2	4.9	4.5	4.5	4.7	3.6	4.5	4.1
1987–88	**4.0**	3.2	4.5	4.2	4.2	4.5	3.3	3.9	3.9
1989–90	**3.6**	3.0	3.9	4.0	4.0	4.3	3.1	3.7	3.6
1991–92	3.3	2.9	3.5	3.2	3.8	3.5	2.8	3.5	3.3
Average annual growth rate									
1985–86 to 1991–92	–4%	–2%	–5%	–5%	–3%	–5%	–4%	–4%	–4%

(a) Includes Department of Veterans' Affairs General and Auxiliary hospitals.

Sources: Mathers & Harvey 1988; Gillett et al. 1991; Gillet & Solon 1992; Cooper-Stanbury, Solon & Cook 1994

On the other hand, in Victoria, which formerly had 20% fewer beds per 1,000 population than the national average, the bed supply declined by only 2% per year, so that by 1991–92 Victoria's bed supply was 10% below the national average.

The availability of beds in all types of health care institutions varies between States and Territories (Table 4.9). For acute hospitals in 1991–92, the Australian Capital Territory had a lower bed ratio (3.4 beds per 1,000 population) than the other States or Territories. For aged care beds in nursing homes and hostels, the lowest ratio is also in the Australian Capital Territory (83.7 beds per 1,000 population aged 70 years or older).

In 1991–92 non-metropolitan areas had higher ratios for beds in acute hospitals (5.1 beds per 1,000 population) than did metropolitan areas (4.2) (Table 4.10). The much higher ratio for public hospital beds in non-metropolitan areas (4.1 per 1,000 population) in comparison with metropolitan areas (2.9) was partly offset by a lower ratio for beds in private hospitals (1.0 per 1,000 population in non-metropolitan areas, compared with 1.3 in metropolitan areas).

Table 4.9: ***Beds per 1,000 population,[(a)] States and Territories, 1991–92***

Institution type	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Hospitals									
Public acute[(b)]	3.3	2.9	3.5	3.2	3.8	3.5	2.8	3.5	3.3
Private acute[(c)]	0.9	1.3	1.3	1.1	1.5	1.2	0.6	0.8	1.1
Public psychiatric	0.4	0.6	0.5	0.3	0.5	0.3	–	–	0.4
Aged nursing homes	62.1	49.3	54.6	57.3	56.7	57.2	43.4	64.2	56.3
Hostels	33.5	34.5	45.9	41.1	44.0	28.9	40.3	43.0	37.4

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

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

(c) Private hospitals include private psychiatric hospitals and exclude freestanding day hospital facilities.

Sources: Cooper-Stanbury, Solon & Cook 1994; ABS Cat. No. 4390.0

Despite the higher total bed ratios, people in non-metropolitan areas generally have limited access to some specialities and to intensive care beds. For example, all teaching hospitals are located in major urban areas. The greater specialisation in major urban areas, essential to maintain skill levels and quality of care, means that rural and non-capital city people are more likely to require inter-hospital transfer than are people living in the major urban areas.

In contrast to acute hospital beds, ratios for beds in nursing homes for the aged were lower in non-metropolitan areas (3.3 beds per 1,000 population aged 70 and over) than in the metropolitan areas (4.6 beds) (Table 4.10).

Table 4.10: ***Beds per 1,000 population, by metropolitan and non-metropolitan areas, 1989–90 and 1991–92***

	1989–90		1991–92	
Institution type	Metro	Non-metro	Metro	Non-metro
Hospitals				
Public acute[(a)]	3.1	4.6	2.9	4.1
Private acute[(b)]	1.4	0.8	1.3	1.0
Public psychiatric	0.5	0.5	0.5	0.4
Aged nursing homes	4.6	3.7	4.6	3.3

(a) Includes Department of Veterans' Affairs General and Auxiliary hospitals.

(b) Private hospitals include private psychiatric hospitals and exclude freestanding day hospital facilities. Hospitals were classified by ABS as 'capital city' or 'rest of state'.

Sources: Gillet & Solon 1992; Cooper-Stanbury, Solon & Cook 1994; ABS Cat. No. 4390.0; DHHLGCS unpublished data

4.3 Use of hospitals

This section follows the National Health Data Dictionary (NHDD) definitions and presents data only for patients treated within hospitals (see Boxes 4.2 and 4.3).

Box 4.2: Statistics relating to use of hospitals

Most of the data on the use of hospitals are based on information collected at the end of patients' hospital stay, rather than at the beginning. The reason for this is that the length of stay and the procedures carried out are then known, and the diagnostic information is more accurate.

Statistics on use of hospitals, while commonly referred to as admission statistics, are therefore more correctly referred to as hospital separation statistics. Separation is defined in the National health data dictionary—institutional health care *as 'the administrative process by which a hospital records the completion of treatment and/or care and accommodation of a patient'. This occurs when an admitted patient leaves hospital, transfers to another institution, or dies.*

As indicators of community morbidity, hospital separation data have some limitations. Sick people who do not use hospitals are not counted. The method of collection also means that those who are admitted more than once, or to more than one institution, are usually counted on each occasion.

The States and Territories collect information about hospitalisation, and some produce reports containing useful morbidity data. However, the collections have not been managed uniformly, resulting in problems of comparability. In recent years, there have been encouraging developments towards standardisation, and all States and Territories now provide some data to AIHW for inclusion in national reports and databases, but only New South Wales, Queensland and South Australia provide comprehensive information about hospitalisation in both public and private hospitals. A recent ABS survey of private hospitals (ABS 1993) provides data to fill some gaps and to help estimate Australian totals.

A major step towards standardisation was development of a National Minimum Data Set for Institutional Health Care, which was adopted in 1989. AIHW is collaborating with the ABS to conduct annual surveys of health institutions over four years from 1991–92.

Hospital Utilisation and Costs Study

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

During 1989, the Institute undertook a second HUCS, for 1987–88, and presented the data in a special report and in Australia's health 1990. *Data from these two HUCS surveys and from the third and fourth HUCS, for 1989–90 and 1991–92, are included in this report. An annual National Minimum Data Set collection, including data on private hospitals, has replaced the original HUCS surveys, although the HUCS title has been retained to ensure continuity. Some data from the first of these surveys, in 1991–92, are also included in this report.*

Box 4.3: Definitions relating to hospital care

Hospitals provide a wide range of health services and treat patients in a variety of settings. Patients who require admission to hospital have long been referred to as inpatients. Other patients are treated in accident and emergency departments, undergo specialised short-term treatment such as minor surgery, radiotherapy or chemotherapy, or are treated in their own homes through home nursing programs. Such patients are frequently termed outpatients.

However, the terms 'inpatient' and 'outpatient' are ceasing to be used in statistics, which from July 1994 will simply show whether patients have formally been admitted to hospital for treatment. Hospital patients will be classified as admitted patients (including same-day patients) and non-admitted patients. A 'patient' is a person for whom the hospital accepts responsibility for treatment and/or care. An 'admitted patient' is a patient who undergoes a hospital's formal admission process. A 'same-day patient' is a patient who is admitted to and separates from the hospital on the same day.

'Admission' means the process by which an admitted patient commences an episode of care.

'Bed-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.

'Occupancy rate' describes the use of hospital beds relative to the capacity in hospitals. Occupancy rate is calculated as the ratio of total bed-days in a year to total possible bed-days in a year times 100, where the total possible bed-days equals available beds (see Box 4.1, page 156) multiplied by the number of days in the year.

'Separation' means the process by which an admitted patient completes an episode of care, for example leaving the hospital by being discharged, by dying, or by being transferred to another hospital for further care.

Classification of areas into 'metropolitan' and 'non-metropolitan' follows the convention of the State and Territory health authorities and HUCS, and has varied little over time. In 1989–90, the only areas apart from the capital cities classified as 'major urban' were Newcastle, Wollongong, Geelong and Launceston. The ABS survey of private hospitals classified areas into 'capital cities' and 'other'.

Use of acute hospitals—admitted patients

Rates of admission to acute hospitals have fluctuated over the last two decades, an increase during the 1970s being followed by a slight decline in the early 1980s. During 1982–83 to 1988–89, admissions per 1,000 people fluctuated around 215, then increased substantially to 240 in 1991–92 (Table 4.11, page 163).

By international standards, Australia's rate of admission to acute care hospitals seems very high. In 1989–90, the Australian rate of 225 per 1,000 population was the highest among 17 OECD countries, for which the median rate was 165 per 1,000 population (AIHW 1994; OECD 1993).

Australia's comparatively high admission rate results mainly from the inclusion of same-day admissions, which most OECD countries exclude from their calculation. If same-day admissions are excluded from the Australian calculations, the admission rate drops to 170 per 1,000 population, placing Australia sixth among 16 OECD countries (Iceland, which also includes same-day patients in its admission statistics, having been excluded from the comparison).

Australia's comparatively high rates of admission are counterbalanced by its comparatively short average length of stay, 5.6 days for 1989–90. This is the lowest among the OECD countries. Excluding same-day admissions increases the average length of stay to 7.2 days, making Australia fourth lowest in the OECD survey.

The average time spent in acute hospitals by admitted patients declined by 28% from 6.9 to 5.0 days between 1982–83 and 1991–92. The rapidity of the decline in length of stay has also increased, from 1.9% per year from 1982–83 to 1984–85, to 2.9% per year over the next four years to 1988–89, then to 5.5% per year over the years from 1989–1990 to 1991–92.

The reductions in length of stay are attributable to many factors including: fewer patients who need only nursing home care being cared for in acute hospitals; better anaesthetics and antibiotics; and the use of less invasive surgical techniques. The continued development and increasing application of these techniques is likely to continue the decline in length of stay (Hirsch & Hailey 1992).

Length of stay decreased more, both absolutely and relatively, in private than in public hospitals. Between 1982–83 and 1991–92 the average length of stay in acute private hospitals decreased by 34%, from 6.4 to 4.2 days. Average length of stay in public hospitals declined by 25%, from 7.1 to 5.3 days (Cooper-Stanbury, Solon & Cook 1994).

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

In recent years, the increasing use of same-day treatments, both those which have long been done on a same-day basis and those which until recently have required two or three days in hospital, has accelerated the decline in length of stay.

The sustained reductions in length of hospital stay are reflected in falls in the number of bed-days used by patients in acute hospitals. Between 1985–86 and 1991–92, the number of bed-days per 1,000 population fell by 2.3% per year, from 1,390 to 1,207 (Table 4.11). The slight increase from 1989–90 to 1991–92 in the use of private hospitals, which reversed the decline since 1982–83, was a significant departure from this trend. It contrasted with a fall in the use of public acute hospitals of 2.9% per year over the later period.

Between 1985–86 and 1991–92, occupancy rates for acute hospitals increased, from 69% to 74%. This result was the combination of an increase in occupancy rate from 72% to 79% in the public sector, and a slight increase from 62% to 64% in the private sector, where occupancy rates have since recovered from a low of 58% in 1987–88.

Table 4.11: *Use of acute hospitals,*[(a)] *1985–86 to 1991–92*

Use / Acute hospital type	1985–86	1987–88	1989–90	1991–92
Admissions[(b)]				
Public ('000)	2,466	2,622	2,790	3,025
Public (per 1,000 population)	157	160	165	174
Private ('000)	872	878	1,018	1,157
Private (per 1,000 population)	55	54	60	66
Total ('000)	3,338	3,500	3,808	4,182
Total (per 1,000 population)	212	214	225	240
Average length of stay (Days)				
Public	6.9	6.5	6.0	5.3
Private	5.5	5.2	4.6	4.2
Total	6.5	6.2	5.6	5.0
Bed-days				
Public ('000)	16,891	17,098	16,669	16,122
Public (per 1,000 population)	1,089	1,043	983	926
Private ('000)	4,766	4,532	4,731	4,891
Private (per 1,000 population)	301	276	279	281
Total ('000)	21,657	21,630	21,400	21,013
Total (per 1,000 population)	1,390	1,319	1,262	1,207
Occupancy (Per cent)				
Public	72	73	75	79
Private	62	58	60	64
Total	69	69	71	74
Non-inpatient services				
Public ('000)[(c)]	37,666	43,711	38,209	30,676
Public (per 1,000 population)	2,381	2,666	2,253	1,761

(a) Public hospitals include Department of Veterans' Affairs General and Auxiliary hospitals. Private hospitals include private psychiatric hospitals and exclude freestanding day hospital facilities.

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

(c) Number of services was estimated as the number of treatments plus three times the number of visits for 1985–86, 1987–88 and 1989–90, but as reported for 1991–92.

Sources: Mathers & Harvey 1988; Gillett et al. 1991; Gillet & Solon 1992; Cooper-Stanbury, Solon & Cook 1994; ABS Cat. No. 4390.0

Many factors have influenced occupancy levels. The effects of population growth and shorter lengths of stay were similar in public and private hospitals, although the increase in admission rates had more effect on occupancy levels in private hospitals. Another major difference related to changes in bed supply. In the public sector, the reduction in bed supply largely dictated occupancy levels, but the impact of changes in bed supply in the private sector was minor.

Same-day surgery

The trend over recent years to same-day treatment of hospital patients reflects changing medical practice and pressure for increasing productivity.

As well, more patients in public acute hospitals are being treated on a day-only basis. This trend has been encouraged through incentives under the Medicare Agreements for public hospitals to treat suitable surgical patients on a day-only basis. The proportion of same-day patients in public acute hospitals has increased from 20% in 1987–88 to 24% in 1989–90 (AIHW unpublished data). In 1991–92, 28% of admissions to public acute hospitals and 43% of admissions to private hospitals were same-day patients. For many diagnostic procedures, and some surgical procedures, most patients receive same-day care.

The availability of private health insurance benefits for designated procedures performed on same-day patients has had a major influence too. In 1985–86 there were no freestanding private day surgery centres, in 1989–90 there were 39 (Gillett & Solon 1992), and in 1991–92 there were 72 (ABS 1993), over one-third of them dedicated to endoscopy. These freestanding same-day hospitals had a total of 556 beds, fewer than 3% of private hospital beds, but they accounted for nearly 10% of private hospital separations.

Use of acute hospitals—non-admitted patients

In 1991–92 an estimated 30.7 million occasions of service and group sessions per year, or 1,761 services per 1,000 population, were provided in public hospitals, compared with 850,700, or 48 treatments per 1,000 population, provided in private hospitals, which generally do not offer non-admitted patient care.

The data available on non-admitted patients treated in public hospitals have limited reliability because they have not been collected in a consistent manner, either over time or between States and Territories (Cooper-Stanbury, Solon & Cook 1994). Since the late 1980s, New South Wales and South Australia have introduced more rigorous guidelines for the counting of non-admitted patients. These changes reflect the NHDD principles, and have led to a more consistent count of non-admitted patient services.

Regional variations in acute hospital use

In 1991–92 there were 2.0 million admissions to public acute hospitals in metropolitan areas, and 1.0 million in non-metropolitan areas. The admission rate to public acute hospitals in metropolitan areas was 166 per 1,000 population, somewhat lower than the rate of 192 to hospitals in other areas. Patients admitted to metropolitan public acute hospitals also had a slightly shorter length of stay, of 5.3 days compared with 5.4 days for patients in non- metropolitan hospitals (Table 4.12).

Metropolitan public acute hospitals provided 10.7 million bed-days or 879 bed-days per 1,000 metropolitan population and non-metropolitan public hospitals provided 5.4 million bed-days or 1,036 per 1,000. The bed-day use per 1,000 population is 18% higher for public acute hospitals outside the metropolitan areas than for those in metropolitan areas.

The 1991–92 private hospitals survey revealed that there were 872,000 admissions to capital city private hospitals, and 286,000 to private hospitals elsewhere. The capital city hospitals had 71 admissions per 1,000 population, other private hospitals having 55 admissions per 1,000. The average length of stay of 4.2 days in private hospitals was the same in capital cities and elsewhere.

Capital city private hospitals provided 3.7 million bed-days, 302 per 1,000, and other private hospitals provided 1.2 million bed-days, or 231 bed-days per 1,000 population.

Table 4.12: *Regional variations in use of acute hospitals,*[a] *1991–92*

Region	Type of hospital Public[b]	 Private[c]	Total
Separations (per 1,000 population)			
Metropolitan	**166**	71	**237**
Non-metropolitan	**192**	55	**247**
All regions	**174**	66	**240**
Average length of stay (days)			
Metropolitan	**5.3**	4.2	**5.0**
Non-metropolitan	**5.4**	4.2	**5.1**
All regions	**5.3**	4.2	**5.0**
Bed-days (per 1,000 population)			
Metropolitan	**879**	302	1,181
Non-metropolitan	1,036	**231**	1,266
All regions	926	**281**	1,206

(a) Public hospitals include Department of Veterans' Affairs General and Auxiliary hospitals. Private hospitals include private psychiatric hospitals and exclude freestanding day hospital facilities.

(b) For public hospitals, 'metropolitan' equates to 'capital city' plus the major regional centres of Newcastle, Wollongong, Geelong and Launceston. 'Non-metropolitan' equates to all other areas.

(c) For private hospitals, 'metropolitan' equates to 'capital city' and 'non-metropolitan' equates to 'rest of state'. Private hospitals include private psychiatric hospitals. Rates were calculated using 'non-metropolitan' population base.

Sources: Cooper-Stanbury, Solon & Cook 1994; ABS Cat. No. 4390.0

These differences in acute hospital use may result from factors such as differences in the demographic structure and health of the population, differences in the policy and structure of the health system, and characteristics of medical practice. In the case of private hospitals, use of beds is affected by generally lower levels of private health insurance outside metropolitan areas (see Section 3.3).

Structural and policy differences in the health system which may influence hospital use include the distribution of specialty services (and the need to transfer patients), numbers of doctors, the de-institutionalisation of psychiatric services and the supply of hospital beds. Medical practice may vary in its choice of admitted or non-admitted treatment for patients, and in the extent to which surgery is used for particular conditions.

Where people live does not determine where they will attend hospital, and many rural and smaller city residents may have to attend hospitals in major urban centres, particularly when specialised services are required. Comparison of regional hospital use is thus complicated by inter-regional flows, some of which may be significant, of patients from one region to a hospital in another. For example, the catchment population for hospitals in the Australian Capital Territory includes neighbouring areas of south-eastern New South Wales. The lack of data on the catchment populations of specific hospitals or groups of hospitals precludes an analysis of the inter-regional flow of patients.

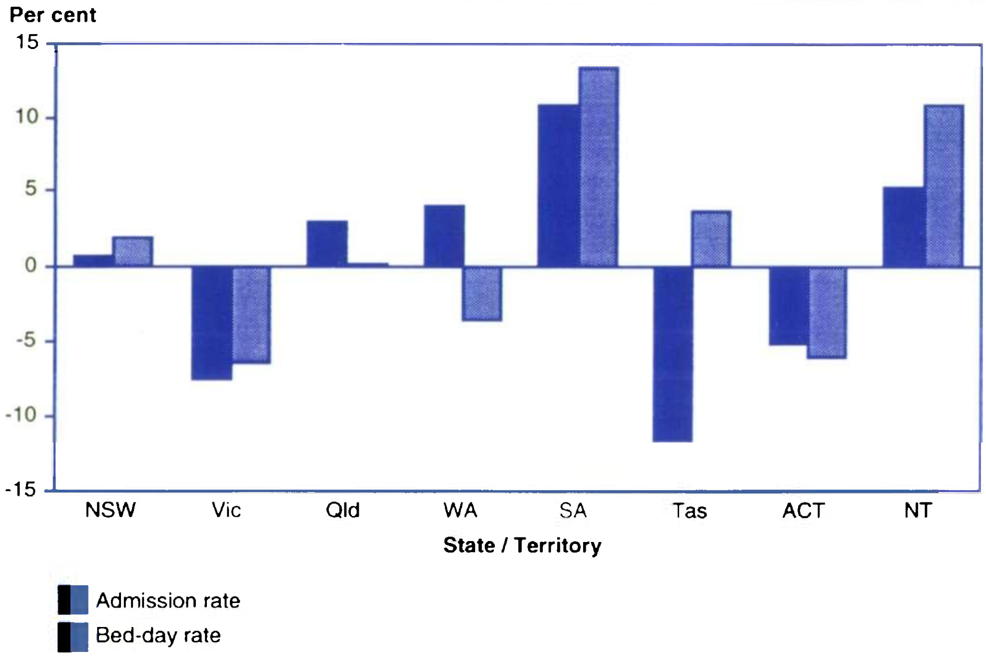
State and Territory variations in acute hospital use

There are substantial differences across the States and Territories in the use of acute hospitals (Table 4.13, Figure 4.2). Tasmania has the lowest level of public hospital admissions, 154 admissions per 1,000 population, but the highest average length of stay of 6.3 days. In contrast, South Australia has an admission rate of 193 per 1,000 population but a shorter average length of stay of 5.4 days.

Table 4.13: *State / Territory use of public acute hospitals,*[(a)] *1991–92*

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Separations (per 1,000 population)	175	161	179	181	193	154	165	183	174
Average length of stay[(b)] (days)	5.4	5.4	5.2	4.9	5.4	6.3	5.3	5.6	5.3
Bed-days (per 1,000 population)	944	867	928	893	1,051	960	870	1,028	926
Occupancy rate (per cent)	80	82	73	76	75	76	85	80	79
Outpatients[(c)] (per 1,000 population)	1,748	1,690	1,683	1,767	1,650	1,319	1,238	1,600	1,724

(a) Public hospitals include Department of Veterans' Affairs General and Auxiliary hospitals.
(b) Total bed-days / total separations.
(c) Non-inpatient occasions of services.
Source: Cooper-Stanbury, Solon & Cook 1994



Source: Department of Employment, Education and Training unpublished data

Figure 4.2: *Admission and bed-day rates, difference from Australian average, 1991–92*

As noted earlier, differences in population age structures can contribute to the differences in admission rates between the States and Territories. For example, 12.8% of the South Australian population is aged 65 years or more, compared with only 5.9% of the population of the Australian Capital Territory, where the admission rate is relatively low.

Other reasons for the differences are not entirely clear. Some of the variation in admission rates may result from varying classifications of same-day patients, as admitted patients or as non-admitted patients. The lack of data on same-day admissions for all States and Territories, and for public and private hospitals, precludes a complete evaluation of this factor.

4.4 Waiting lists

Uses of waiting list information

Ideally, patients would be given a firm admission date when their doctor first requested hospital care. In practice, this is not possible. Hospitals cannot accurately predict the resources required to treat patients requiring immediate admission. Consequently, hospitals usually do not allocate admission dates for elective patients until they are comparatively close. The maintenance of some form of waiting list should therefore be regarded as part of the efficient operation of a hospital.

Waiting list information can also be used by hospitals to identify the need to allocate resources between specialities, such as operating theatre time. District managers can use it to identify a need to redistribute resources between hospitals. Health planners use data on expected waiting times for different groups of patients as indicators of possible inequity within the health system.

Patients and doctors require data on expected waiting times to choose a hospital. Doctors and hospital administrators require data on the numbers of people waiting too long for hospital care as a measure of quality of care.

Unfortunately, waiting lists are often also used as measures of 'unmet community need', because they show the number of people who need hospital care but have not yet gained admission. As a result, waiting lists have been the subject of political debate. Such debate is misguided; waiting lists reflect unmet need only where all people with a condition know of it, have sought medical advice, been diagnosed, and accepted a recommendation for surgery, the hospital has been notified, and the patient placed on the waiting list.

The interpretation of waiting list information is complicated. Large waiting lists do not necessarily indicate poor hospital performance. The numbers waiting may reflect factors such as the size of the community served, the amount of surgery performed, the proportion of emergency surgery, clinician referral patterns and the overall efficiency of the hospital. Provided patients receive appropriate supervision, waiting may not be disadvantageous. In some instances, 'watchful waiting' may even be preferred clinical management. In others, waiting may result from factors beyond the control of hospitals; a good example is the need for transplant recipients to wait for compatible donor organs to become available.

Australian waiting list data are made harder to interpret because different hospitals include different types of patients on their lists: some hospitals include only patients requiring surgery, others include both surgical and some medical patients; some hospitals include patients who have been given an admission date, others do not; some hospitals count patients currently not ready for care, such as women in early pregnancy who will later require Caesarean section, others do not.

There are also data quality issues. Few hospitals routinely review their lists, which can include patients who cannot be contacted, have died, have already been treated elsewhere or who no longer require hospital care for personal or medical reasons. Audits have reported 20% or more of patients on waiting lists as inappropriately listed (Fraser 1991; Brewster, Nicholson & Farndon 1991; Standards Sub-Committee of the Victorian State Committee of the Royal Australasian College of Surgeons 1991).

The statistics used have also varied. Average waiting time, median waiting time, proportions of patients waiting different lengths of time, and clearance time (the time required to treat all patients if no further patients were added to the list) have all been presented.

If these problems can be overcome, good waiting list data will provide valuable information to patients, doctors, hospital administrators and health planners.

Box 4.4: Urgency Categories used in Victoria

Category 1 (urgent)*: Very early admission desirable for a condition that has the potential to deteriorate quickly, to the point where it becomes an emergency. Admission within 30 days is desirable.*

Category 2 (semi-urgent)*: Admission within 90 days acceptable for a condition causing some pain, dysfunction or disability but which is not likely to deteriorate quickly or become an emergency.*

Category 3 (non-urgent)*: Admission at some time in the future acceptable for a condition causing minimal or no pain, dysfunction or disability, which is very unlikely to deteriorate quickly and which does not have the potential to become an emergency.*

Source: *Victorian Department of Health and Community Services 1993*

Survey of waiting lists

In order to estimate both the numbers of patients currently waiting for elective surgery and the times people wait for surgery in public hospitals, AIHW conducted a survey of State and Territory health authorities in October 1993 (Gillett & Mays 1994). Health authorities were asked to provide their most recent data on elective surgery waiting lists according to a standard format. Only patients who were ready for care were to be counted.

Most States collect waiting list statistics only from large hospitals, advising that in a number of smaller hospitals all patients waiting for elective surgery have been admitted within a reasonable time.

All States and Territories except Queensland provided data, although not always in the requested format (Table 4.14). Queensland has not collected waiting list information centrally to date, although hospitals maintain data.

Table 4.14: *Available data on public hospital waiting lists, by State / Territory*

State / Territory	Date of census	Hospitals included	Patients included
New South Wales	30.11.92	187 public	Booked & unbooked
Victoria	1.7.93	29 major public	Unbooked[a]
Queensland	–	–	–
Western Australia	30.9.93	5 public teaching	Booked & unbooked
South Australia	31.7.93	6 major public	Booked & unbooked
Tasmania	1.10.93	3 major public	Booked & unbooked
Australian Capital Territory	30.9.93	2 public	Booked & unbooked
Northern Territory	1.10.93	2 public	Booked & unbooked

(a) Includes booked patients who do not have an admission date up to six weeks from census date (Health Department of Victoria Elective Surgery Activity Bulletin No.1 January 1992)

Source: Gillett & Mays 1994

Waiting list data were estimated as numbers of patients per 100,000 resident population for those States supplying compatible data and extrapolated to the Australian population.

Data were used to describe lists at a given point of time (snapshot data) and to describe movement within the lists of patients who had been admitted for surgery or who had been removed from the lists for any other reason (throughput data). Clearance time was calculated by dividing the number of patients on a list at a given time by the rate at which they were removed from the list.

From the data supplied, there were an estimated 644 people per 100,000 population waiting for elective surgery in 1993 (Table 4.15, page 170). As 11% of removals from waiting lists are for reasons other than admission for surgery, it is estimated that 572 people per 100,000 would accept a hospital place if offered. In addition, it is estimated that between 22 and 65 patients per 100,000 scheduled for elective surgery in small hospitals were not included in the data used in the table.

After adjusting for people on lists who would not have accepted surgery if offered and for small hospitals for which no data were available, it is estimated that there were between 103,000 and 112,000 people waiting for elective surgery in Australian public hospitals during 1993. However, this estimate needs to be interpreted with care, because the underlying data are incomplete and were not collected in a consistent way.

Using data from hospitals for which comparable data were available, it was estimated that 319 people are admitted for elective surgery each month for every 100,000 Australians. Another 40 people are removed from the waiting list for other reasons, making 359 removals per 100,000. The 644 people per 100,000 population waiting for elective surgery in these hospitals thus represent a clearance time of 1.8 months.

These statistics are all easily understood. However, the relationship among them is complicated, because waiting lists are, in fact, multiple queues, proceeding at different rates as patients require treatment with differing degrees of urgency. Clearance time measures the system's capacity to treat people waiting for care, rather than the time any particular patient will wait. Further, the numbers of people waiting are not distributed evenly across all hospitals and across all specialties.

Table 4.15: ***Estimated statistics for elective surgery waiting lists in those public hospitals for which comparable data were available,[a] Australia, 1993.***

	Point-of-time estimates of elective surgery waiting lists			Estimated monthly numbers of persons (throughput)		
Specialty	**Patients waiting**	**Waiting <1 month**	**Waiting > 6 months**	**Routine** (b)	**Removed** (c)	**Total removals** (d)
	Per 100,000 population	*Per cent*	*Per cent*	*Per 100,000 population*		
Cardio-thoracic	9.2	41	14	8.3	0.9	9.1
Ear, nose and throat	101.4	18	43	22.0	5.7	27.8
General surgery	135.2	35	25	94.9	8.6	103.5
Gynaecology	73.1	43	17	58.4	4.5	62.9
Neurology	6.5	50	12	5.9	0.7	6.6
Ophthalmology	39.6	24	28	17.2	2.7	19.9
Orthopaedics	129.3	21	38	36.5	7.5	43.9
Plastic	32.8	19	47	10.6	1.8	12.4
Urology	60.2	29	31	25.3	3.7	29.0
Vascular	12.6	32	40	7.4	0.9	8.3
Other	44.1	40	16	32.2	3.2	35.4
All patients	**643.9**	**29**	**31**	**318.7**	**40.1**	**358.9**

(a) Refer to Table 4.14 for hospitals included.

(b) Routinely admitted for elective surgery.

(c) Removed from elective surgery waiting lists for other reasons besides admission including: patient could not be contacted, surgery no longer required, patient treated elsewhere, patient previously admitted as an emergency.

(d) Total removals from elective surgery waiting lists.

Source: Gillett & Mays 1994

Snapshot data estimates are that at any time 29% of people have been waiting for under a month, but 31% have been waiting for over six months. Patients waiting for elective surgery are likely to be waiting for general surgery (21% of all patients), orthopaedic surgery (20%) or ear, nose and throat surgery (16%). The percentages of patients of these specialities who have waited for over six months are 25%, 38% and 43% respectively (Table 4.15).

However, snapshot data can distort the time people wait, and the proportions of people who have long waits, which are better measured by throughput data. For snapshot data, the South Australian results are close to the national average, with 26% of people having been waiting for under one month and 29% of people having been waiting for over six months. Throughput data show that 51% of patients admitted over a six-month period waited less than one month and 12% waited over six months (Table 4.16, page 171).

Some specialties have large proportions of patients with long waits. The specialties with the largest percentages of patients waiting over six months are plastic surgery (47%), ear nose and throat surgery (43%) and vascular surgery (40%) (Table 4.15).

Although more people were waiting for general surgery than for any other specialty, general surgery has a relatively high throughput of 30% of all elective surgery admissions with a relatively low clearance time of 1.3 months (clearance times can be derived from Table 4.15 by dividing the total numbers of patients on the list at snapshot by the total removals). In contrast, the clearance times are longest for ear nose and throat surgery (3.6 months), orthopaedic surgery (2.9 months) and plastic surgery (2.7 months).

Only Victoria had data by urgency category, which suggest that according to its criteria (Box 4.4, page 168), about 23% of patients waiting for care have waited longer than clinically appropriate.

Table 4.16: ***Patients waiting less than one month and over six months at a point in time and admitted over a six-month period, by specialty, South Australia,[a] July 1993***

	Per cent of patients waiting at census		Per cent of patients admitted	
Specialty	**Under 1 month**	**Over 6 months**	**Under 1 month**	**Over 6 months**
Cardio-thoracic	46	4	74	1
Ear, nose and throat	17	47	43	23
General surgery	30	21	55	8
Gynaecology	33	20	47	6
Neurology	53	9	75	1
Ophthalmology	45	6	53	4
Orthopaedics	20	26	33	24
Plastic	20	35	54	13
Urology	26	33	54	13
Vascular	26	50	75	8
Other[b]	61	–	44	1
All patients	**26**	**29**	**51**	**12**

(a) Includes both booked and unbooked patients from the Flinders Medical Centre, Lyell McEwin Health Service, Modbury, Royal Adelaide, The Queen Elizabeth and Women and Children's (Adelaide Children's Hospital Campus) Hospitals.

(b) Includes cranio–facial and 'unknown' surgery.

Source: Gillett & Mays 1994

Equity of access to public hospitals

For several years there has been continuing debate whether some patients have preferential access to public hospitals. There is anecdotal evidence, for example Davis et al. (1991), of private patients having more rapid access to elective surgery than public patients. However, shorter waiting times for private patients in public hospitals could result where those with least urgent conditions (who potentially would have the longest waits) elect to be treated in private hospitals. National implementation of urgency categories would go some way to informing the debate, but currently available data lack sufficient clinical detail to resolve it.

Future directions

In recognition of the varying requirements for data, the Australian Institute of Health and Welfare has received funding to develop national definitions for counting of patients on hospital waiting lists and reporting on these. The Institute expects to complete this work during 1993–94, with better data becoming available during 1994–95.

These reports will change the emphasis from the numbers of people on the list at a point in time to numbers of people who wait an inappropriate time for their clinical condition. These numbers should be the main indicators of system performance in elective surgery provision. The Department of Human Services and Health has initiated a process to involve surgeons in the development of a national set of urgency categories and associated maximum waiting times.

In future, purchaser-provider arrangements could involve assessment of performance in the provision of services. The Victorian Department of Health and Community Services has begun to apply funding sanctions based on clinically inappropriate waits for elective surgery. Where patients are found at census to have been waiting longer than the time limit for their urgency category, a hospital is denied access to an 'additional throughput pool'. As timely access to needed care is an aspect of the quality of service provision, tying funding to performance may become more widespread.

Reports of waiting lists should place a much greater emphasis on throughput data than is currently done by State and Territory health authorities, most of which provide snapshot data only. Tables 4.15 and 4.16 demonstrate the need for both throughput and snapshot data.

4.5 Medical services

Services by doctors are a mainstay of Australia's health service system. Under Medicare, all Australians are eligible for benefits for private medical services outside hospitals and for services as private patients in hospitals; comprehensive data are available on these services from the Health Insurance Commission (HIC), which pays benefits for them. This section describes use of private medical services covered by Medicare. It provides an overview of use of medical services by broad type of service, variations in use by age and sex, and variations in use by State. Data have been obtained from Medicare claims processed by the HIC and from the claim files held by the Commonwealth Department of Human Services and Health.

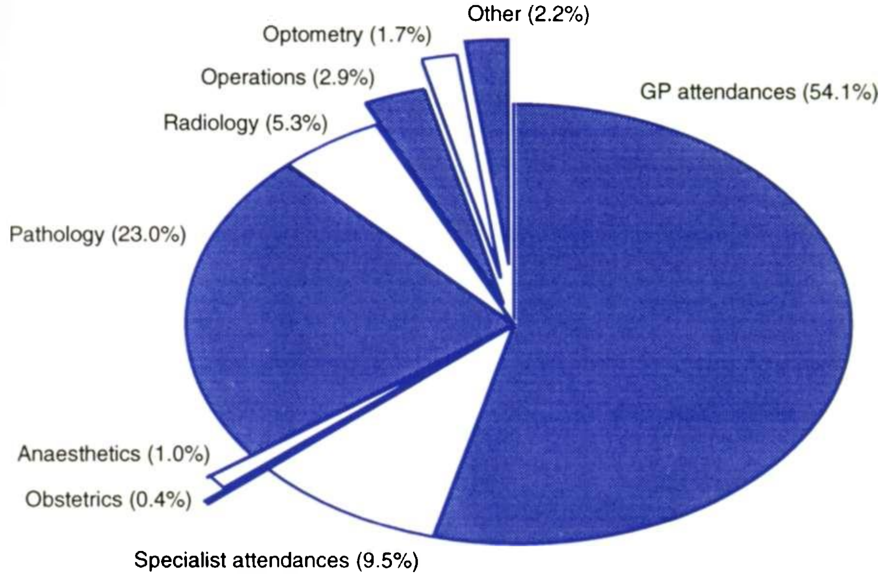
Medicare also provides for free treatment, including medical treatment, of public patients in public hospitals. These services are not billed to the HIC but are paid by hospitals, and they are not reported on here.

Some types of medical services do not qualify for Medicare benefits, and these types also are not included in the analyses below. They include services to eligible military service veterans and their dependants, services covered by motor vehicle third party insurance and workers' compensation schemes, services provided by public authorities and most government-funded community health services, and services not necessary for patient care (for example, examinations for employment purposes).

Use of private medical services

In 1992–93, Medicare provided benefits for 172.3 million services. This represents an increase of 27.5% over the 135.1 million services in 1987–88. The increase over this period was due to the combined effect of population growth (6.8%) and a rise in the number of services per person (19.4%).

Over half (54.1%) of the medical services in 1992–93 were general practitioner attendances, 23.0% were pathology and 9.5% were specialist attendances (see Figure 4.3).



Source: DHHLGCS unpublished data

Figure 4.3: *Medicare services by broad type of service, 1992–93*

The most notable increases in total services from 1987–88 to 1992–93 have occurred in optometry services (48.3%). The considerable growth in these services is due to a number of factors including the increased profile of eye care, especially in schools, ageing of the population, and perhaps assessment required with use of computer terminals.

The smallest increase over this five-year period was 14.4% in obstetrics. This value is still much higher than the growth in number of births over a comparable period (5.3% rise from 1987 to 1992), suggesting that there has been an increase in the number of obstetric services not directly related to the birth, such as diagnostic procedures performed during pregnancy. The next smallest increase was 21.8% in anaesthetic services; operations increased by 34.9%, suggesting an increase in the average number of procedures at each operation.

Comparing 1992–93 figures with the previous year reveals a 30.5% increase over 1991–92 in pathology. The 30.5% increase is due to introduction of a patient episode initiation item which accompanied restructure of the pathology schedule in February 1992. This item was designed to cover the administrative costs associated with the collection of specimens, and is therefore counted with almost every pathology episode. The number of diagnostic tests fell significantly between 1987 and 1989 following changes to the Medicare Benefits Schedule. It has stayed almost constant from 1989–90 until 1991–92. The number of tests per episode is falling (episode here means services provided for one individual on the same day).

Another way to look at use of medical services is in terms of services per person. On average in 1992–93, each person received 9.76 medical services; consulting a general practitioner 5.28 times, having 2.25 pathology services and seeing a specialist 0.92 times. Over the past five years, the number of services per person has increased from 8.17 to 9.76, an increase of 19.4%, or average annual increase of 3.6% (Table 4.17).

Table 4.17: *Medicare services processed per capita, by broad type of service, 1987–88 and 1992–93*

	Services per capita				Total	Annual
Type of service	**1987–88**		**1992–93**		**change**	**change**
	Number	*Per cent*	*Number*	*Per cent*	*Per cent*	*Per cent*
GP attendances	4.59	56.1	5.28	54.1	15.1	2.9
Specialist attendances	0.79	9.6	0.92	9.5	17.4	3.3
Obstetrics	0.03	0.4	0.04	0.4	7.1	1.4
Anaesthetics	0.08	1.0	0.09	1.0	14.1	2.7
Pathology	1.78	21.7	2.25	23.0	26.5	4.8
Radiology	0.40	4.9	0.52	5.3	28.2	5.1
Operations	0.22	2.7	0.28	2.9	26.4	4.8
Optometry	0.12	1.5	0.17	1.7	38.8	6.8
Other[(a)]	0.16	2.0	0.22	2.2	32.9	5.9
Total	**8.17**	**100.0**	**9.76**	**100.0**	**19.4**	**3.6**

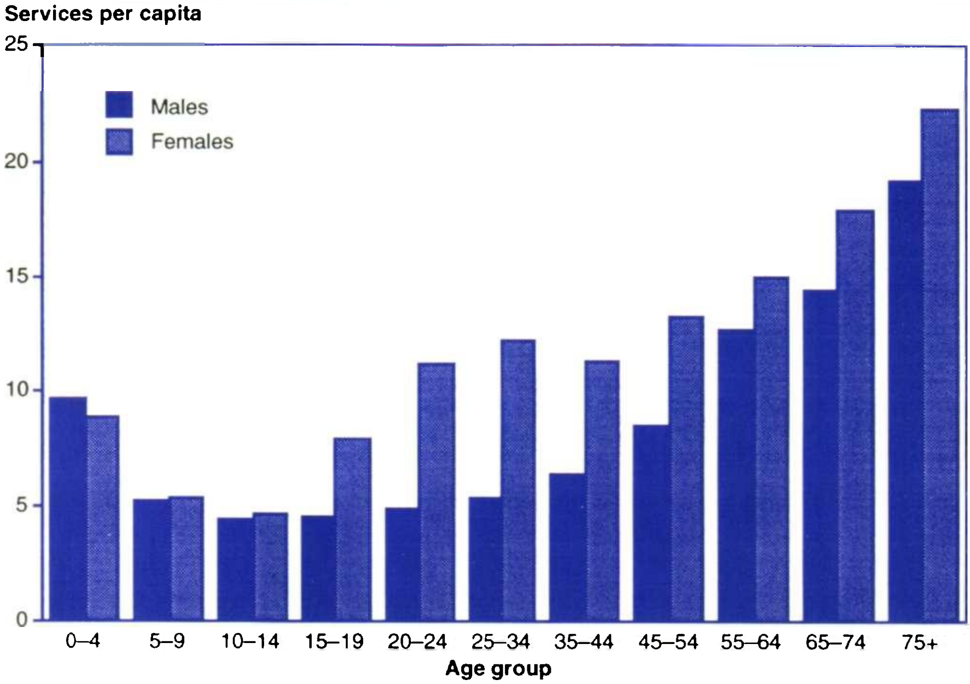
(a) Includes assistance at operations, radionuclear therapy and miscellaneous.

Sources: DHHLGCS unpublished data; ABS Cat. No. 3101.0

Although the average use per person was 9.76 services, the actual number of services per person ranges widely. For example, in 1991–92, 1.3% of Medicare-enrolled people received over 50 services, accounting for 15.0% of total benefits paid. At the other end of the scale, 36.3% of people received from one to five services, accounting for 10.1% of total benefits, and 20.8% of people received no services.

Use of medical services by age and sex

There are considerable age and sex variations in the use of Medicare services, described in Section 1.2.3 on page 9 and illustrated here in Figure 4.4.



Source: Health Insurance Commission 1993

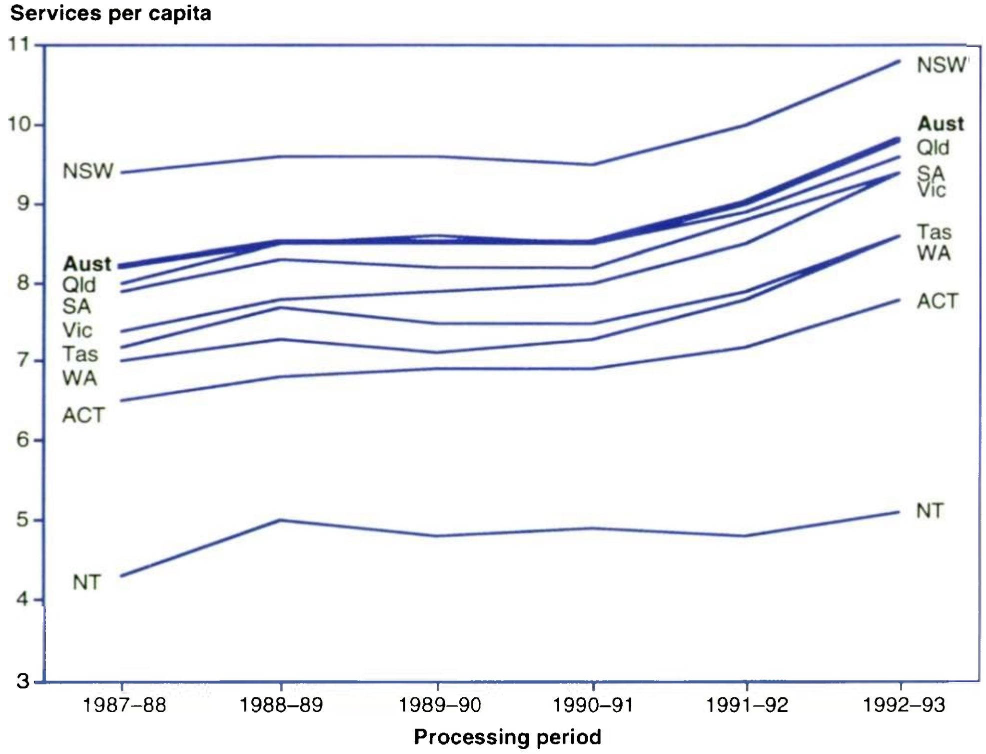
Figure 4.4: ***Medicare services processed per capita, by age and sex, 1992–93***

In 1991–92, 24.9% of males and 16.6% of females received no services. Another 40.5% of males and 32.2% of females received between one and five services. The age group in which the highest proportion of males did not receive a service was 75 years and over (46.8%). Similarly, the highest proportion of females not receiving a service was in the 75 and over age group (40.5%). Somewhat paradoxically, the age group with the largest proportion receiving 51 or more services per person was also the 75 and over group (4.0% for males and 4.8% for females).

The explanation of this finding is that while there is a general trend towards more services per person with increasing age, older people move out of the private medical setting into public hospital inpatient care where medical services are provided without charge and hence do not appear in the data presented. Another major portion of medical services for the elderly is provided through Veterans' Affairs programs; again, these services do not attract benefits under Medicare. The number of Medicare-funded services per person in the older age groups is therefore an underestimate of the total services provided.

Use of medical services by State

Significant variations in the use of medical services occur across States. In 1992–93 the highest use per person was in New South Wales with 10.8 services per person, 10% above the national average of 9.8 services per person. Indeed, New South Wales was the only State to exceed the national average (Figure 4.5). The next greatest use per person occurred in Queensland (9.6 services), followed by South Australia (9.4 services). The lowest per person use occurred in the Northern Territory (5.1 services).



Source: DHHLGCS unpublished data

Figure 4.5: *Medicare services per capita, by state, 1987–88 to 1992–93*

These differences may in part reflect the different mix of public and private patients in hospital (since public patients in public hospitals receive non-chargeable services) and the differences in age structures among States. An analysis of age structure does provide support for this notion: in New South Wales at 30 June 1992 the proportion of males aged 65 or over was 10.3%, greater than the national average of 9.9%; the proportion of women in these age groups in New South Wales was 13.5%, more than the national average of 12.8%. The proportion of these age groups in the Northern Territory was 2.8% for males and 3.0% for females. These variations in proportions of elderly residents may go some way to explaining the highest per capita use of medical services in New South Wales and the lowest in Northern Territory.

From 1987–88 to 1992–93 there was a general consistency in the pattern of service usage (Figure 4.5). The greatest increase over this period occurred in Victoria (annual increase of 4.9% compared with the national average of 3.6%). New South Wales had the lowest State increase (2.8%), with all other States approximating the national average. There was a relatively sharp increase (national average of 8.9%) between 1991–92 and 1992–93 (attributable to the increase in pathology services after February 1992, as discussed previously). Increases in numbers of service items in Victoria and Western Australia exceeded this average (10.6% and 10.3% respectively), while increases in all other States and Territories were less than the national average.

4.6 Dental services

A decreasing level of tooth loss has a major influence on trends in the use of dental services by adults. As explained in Section 2.4, page 94, the increasing numbers with natural teeth leads to increasing numbers using dental services. This use, in turn, will increase the number retaining at least some natural teeth.

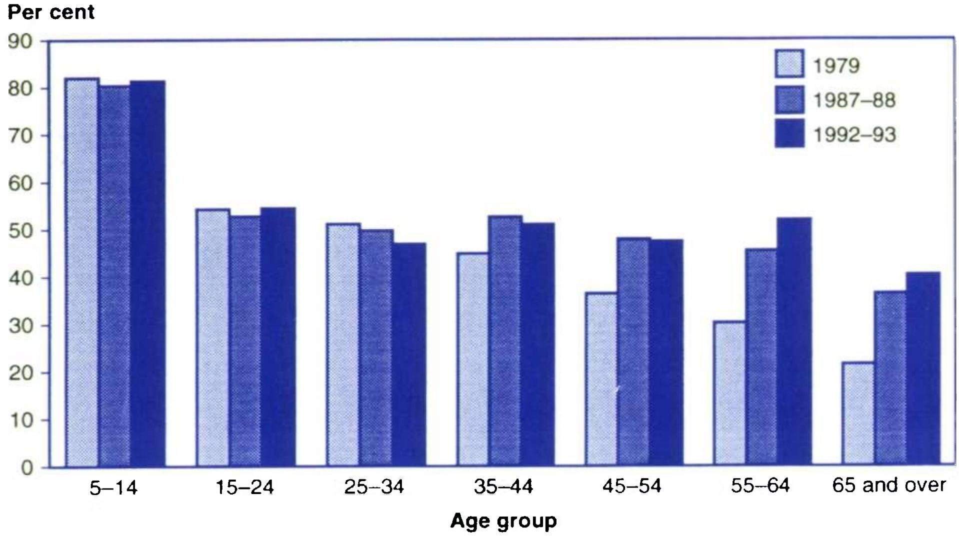
This section focuses on the use of dental services by adults, and on reasons for using or not using these services. The data presented were collected by the Dental Statistics and Research Unit in a telephone survey of seven areas in five States in 1992–93. Comparisons are made with data from 1979 (Australian Bureau of Statistics 1979a, 1979b) and 1987–88 (Barnard 1993).

From 1979 to 1993, the percentage of people up to age 34 who used a dental service in the previous 12 months remained relatively stable, whereas at greater ages use of dental services within the previous 12 months increased. The proportion aged 65 and over who had used a dental service in the previous 12 months nearly doubled (Figure 4.6, page 178).

Approximately half of the people in all household income groups had made a dental visit in the last 12 months. However, there was a major difference between lowest and highest household income group in the percentage who last visited 5 years ago or more. Only 7.6% of people from households earning over $40,000 per year had their last dental visit more than 5 years previously, whereas 13.7% from households earning less than $12,000 per year had done so.

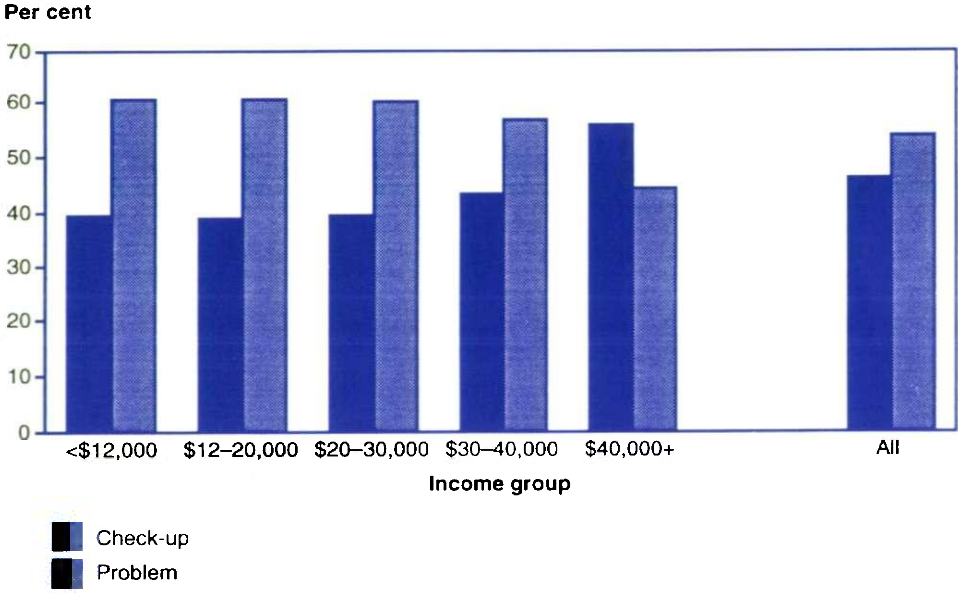
Figure 4.7 (page 178) shows that, except in the highest income group, most adults visited because of a dental problem. As income increases, the usual reason for visiting changes, so that 56% of the highest income group usually visit for a check-up. Reason for visiting thus relates to household income.

The dominance of private dental services in the provision of dental care is more substantial than generally recognised. Private dental services are the predominant providers of dental care to adults in Australia, with 92% of non-health card holders and 64% of health card holders having used a private service on their last visit. Only 36% of health card holders made their last visit to public dental services.



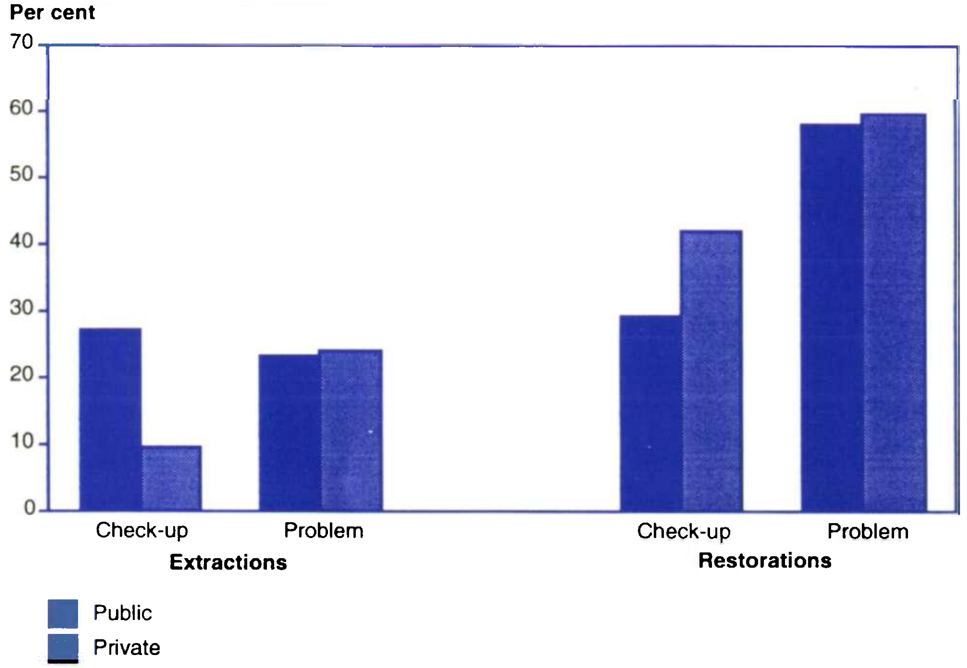
Sources: ABS 1979a,b; Barnard 1993; AIHW DSRU Telephone Interview Survey 1992–93

Figure 4.6: ***Persons visiting a dental provider in the previous 12 months, by age group, 1979, 1987–88 and 1992–93***



Source: AIHW DSRU Telephone Survey 1992–93

Figure 4.7: ***Dentate persons aged 18 to 64 years visiting a dental provider, by income group and usual reason for visit***



Source: AIHW DSRU Telephone Survey 1992–93

Figure 4.8: ***Dentate persons aged 18 to 64 years receiving services, by usual reason for visit and location***

Although the likelihood of extractions appears to be related to the site of last dental visit, this association could be influenced by the usual reason for visiting. The percentage of people reporting extractions in their last course of dental treatment is almost the same for users of public dental services, regardless of whether they visit for a check-up or for a problem, and for users of private dental services who usually visit for a problem. Approximately one-quarter of these users of dental services had an extraction. Only 9.5% of people who visited a private service for a check-up reported an extraction in their last course of treatment (Figure 4.8).

Figure 4.8 also shows, as might be expected, that the percentage of adults receiving restorations was higher among those who usually visit for a problem than among those who usually visit for a check-up. Among those who usually visit for a check-up the percentage receiving restorations was higher among those whose last visit was to a private service. Adults who usually visit for a problem presumably are more likely to have active disease and to need restorations.

Factors affecting use of dental services

Strategies for improving the dental health of disadvantaged people seek to encourage timely treatment to save their natural teeth. In order to identify the groups least likely to obtain check-ups, factors influencing people to seek treatment have been identified.

The analysis was restricted to people with natural teeth, and focused on the characteristics which may be associated with dental service use, rather than on attitudes or behaviour. These characteristics were sex, number of natural teeth, household income and health card status, and difficulty in paying a $100 dental bill. The findings are presented in Table 4.18.

People eligible for health cards were more likely to visit dental services for problems, and despite their lower income and greater difficulty reported in paying a $100 dental bill, many of these visits were to private dental services. This may partly be explained by problems in gaining access to public care. The cost of private care coupled with lower levels of dental insurance among this group increases the probability that these visits were problem-motivated.

Table 4.18: ***Analysis of characteristics concerning whether persons usually attend for dental problems***

Characteristic	Independent effect
Sex	Males were 2.1 times as likely as females to attend for problems.
Number of teeth	People with fewer than 24 teeth were 1.8 times as likely as those with 24 teeth or more to attend for problems.
Income	People with household incomes below $30,000 were 2.4 times as likely as those with incomes above $30,000 to attend for problems.
Health card status	People with health card entitlements were 1.4 times as likely as those without to attend for problems.
Financial hardship	People who reported a lot of difficulty paying a $100 dental bill were 2.1 times as likely to attend for problems.

Source: AIHW DSRU Telephone Interview Survey 1992–93

4.7 Health technologies

4.7.1 Use of health technologies

The growth of diagnostic services

Previous issues of *Australia's health* have drawn attention to the growth in diagnostic services. Important associated issues are increased costs of health care programs and uncertainty regarding the degree of benefit from use of these services.

This discussion considers recent trends in the use of diagnostic services. In 1991–92, 25.4% of the total Medicare benefits paid for all services were for imaging ($532.9 million), diagnostic endoscopy ($45.0 million), and pathology services ($585.4 million).

There is wide variation in the growth of use of different types of tests. Table 4.19 shows how use of conventional radiology tests (X-rays) increased by only 0.1% (from 6.432 million to 6.439 million services) from 1990–91 to 1991–92, and use of ultrasound services increased by 11% (from 1.35 million to 1.50 million).

Table 4.19: *Imaging services, 1984–85 to 1991–92 ('000 services)*

	Type of service				
Year	X-rays	CT	MRI[(a)]	Ultrasound	Total
1984–85	4,341.5	172.4	–	544.0	5,057.8
1985–86	4,899.9	231.3	–	680.2	5,811.3
1986–87	5,195.6	277.1	2.7	802.0	6,277.4
1987–88	5,358.3	298.7	5.6	895.5	6,558.1
1988–89	5,565.9	328.2	8.4	1,026.1	6,928.6
1989–90	5,982.8	358.5	10.7	1,176.2	7,528.2
1990–91	6,432.3	406.6	12.4	1,348.3	8,199.6
1991–92	6,438.6	448.1	10.6	1,495.9	8,393.2
Average annual growth rate (%)	**5.8**	**14.6**	**na**	**15.5**	**7.5**

(a) As from 1 February 1992, MRI services were covered under Health Program Grants. The fall in the number of Medicare services observed in 1991–92 is an artefact of this change.

Source: AIHW 1993a

Any change in use of conventional X-ray examinations has large cost implications, as $301.6 million or 56.6% of the total expenditure on imaging services was devoted to them in 1991–92. However, conventional X-ray examinations as a proportion of imaging services have declined from 85.8% in 1984–85 to 76.7% in 1991–92. Over this period there was rapid growth in use of newer technologies such as computerised tomography (CT) and magnetic resonance imaging (MRI).

Wall (1993) has queried the radiation exposure involved in the use of X-rays and the associated risk of cancer to patients. There is a need to consider whether the risk to the patient from a test involving ionising radiation is justified by the potential benefits. The NHMRC considers the radiation dose acceptable if CT is the appropriate investigative modality. It has stated there is a need to assess the need for each CT examination in the light of potential benefits and risks to the individual patient (NHMRC 1991).

Expressed in terms of number of services per 1,000 population, the average annual growth rate in use of imaging services was 5.9% from 1984–85 to 1991–92 (Table 4.20). During this period, the growth in expenditure was 4.8% at constant 1984–85 dollars (Table 4.21). These trends are believed to reflect growth in use of imaging services generally. Transfer of services from the public to the private sector is not seen as a significant factor in them (Deeble 1991), and ageing of the population has been estimated as contributing only 0.3% per annum to growth in use over the decade to 1986 (Barer et al. 1990).

CT and ultrasound accounted for 23.1% of imaging services and for 42.8% of expenditure on imaging services in 1991–92 (Tables 4.19 and 4.21). Their increased use may simply reflect the usefulness of new technology in diagnosis and management of disease, although demonstrations of the effects of tests on patient management and patient outcome are still very limited.

Table 4.20: *Imaging services, Medicare rates, 1984–85 to 1991–92 (per 1,000 population)*

Year	Type of service				Total
	X-rays	CT	MRI(a)	Ultrasound	
1984–85	278.7	11.1	–	34.9	324.6
1985–86	310.4	14.7	–	43.1	368.1
1986–87	324.3	17.3	0.2	50.1	391.9
1987–88	329.4	18.4	0.5	55.1	403.2
1988–89	336.4	19.8	0.5	62.0	418.7
1989–90	355.4	21.3	0.6	69.9	447.2
1990–91	376.5	23.8	0.7	78.9	479.9
1991–92	372.3	25.9	0.6	86.5	485.3
Average annual growth rate (%)	**4.2**	**12.9**	**na**	**13.8**	**5.9**

(a) As from 1 February 1992, MRI services were covered under Health Program Grants. The fall in the number of Medicare services observed in 1991–92 is an artefact of this change.

Source: AIHW 1993a

Other Medicare data show a 118% increase in selected cardiac tests from 1989–90 to 1991–92. Although this increase may have been partly due to the availability of new technology, such as the Doppler colour ultrasound, the level of benefit associated with this increased activity is unclear (Crowe & Hailey 1992).

Another increase is in the use of diagnostic colonoscopy, from 20,300 procedures in 1984–85 to 102,700 in 1991–92. Use of an alternative test, barium enema examination, decreased from 112,000 to 97,000 over the same period. Thus, diagnostic colonoscopy has added to the earlier diagnostic technique, rather than replaced it.

Table 4.21: *Imaging services, Medicare benefits paid, 1984–85 to 1991–92 ($ million)*

Price / Service	Year								Av. annual growth (%)
	1984–85	1985–86	1986–87	1987–88	1988–89	1989–90	1990–91	1991–92	
Current prices									
X-rays	166.9	194.5	211.2	218.4	235.8	263.8	296.1	301.6	8.8
CT	41.3	57.5	67.1	59.9	67.4	78.8	94.8	106.8	14.5
MRI(a)	–	–	0.6	1.3	2.2	2.9	3.5	3.0	na
Ultrasound	41.9	55.2	64.2	57.9	69.2	85.1	105.7	121.5	16.4
Total	250.0	307.1	343.1	337.4	374.6	430.7	500.1	532.9	11.4
Constant 1984–85 prices									
X-rays	166.9	182.5	181.5	176.0	177.4	187.0	198.5	196.7	2.4
CT	41.3	53.9	57.7	48.3	50.7	55.9	63.5	69.7	7.8
MRI(a)	–	–	0.5	1.0	1.6	2.1	2.4	2.0	na
Ultrasound	41.9	51.8	55.2	46.6	52.1	60.3	70.8	79.3	9.5
Total	250.0	288.1	294.8	271.9	281.9	305.3	335.2	347.6	4.8

(a) As from 1 February 1992, MRI services were covered under Health Program Grants. The fall in the number of Medicare services observed in 1991–92 is an artefact of this change.

Source: AIHW 1993a

Minimal access surgery

'Minimal access surgery' refers to operations performed through tiny incisions or without incisions at all. Compared with traditional open surgery, it generally results in less pain, shorter hospital stays and faster recovery times. Patients should benefit by a faster return to normal activities; hospitals and the health care system should benefit by reducing costs and needing fewer beds; and employers should benefit because their employees lose fewer days to illness. But are these benefits being realised?

The most recent major developments have been in laparoscopic surgery. Gynaecologists have been using the laparoscope since the 1970s for diagnosis and some surgery. With advances in video technology and development of new instruments, surgical use of the laparoscope has increased greatly over the last few years.

The first major change came through its adoption for cholecystectomy (removal of the gall bladder) in 1989. Subsequent developments include laparoscopic versions of appendicectomy, hernia repair, vagotomy, bladder surgery and ulcer repair. The laparoscope has also been used to assist other procedures such as hysterectomy and bowel resection.

The potential impact of these techniques upon surgery in Australia is huge: there were 47,299 hospital admissions to repair hernias and 27,028 to operate on the appendix in 1989–90 (Gillett, Liv & Solon 1993).

Laparoscopic cholecystectomy provides an interesting example of what may happen with other laparoscopic surgery. Estimated numbers of cholecystectomies performed in Australia are shown in Table 4.22). Laparoscopic cholecystectomy was first performed in Australia early in 1990. Some 21,504 cholecystectomies were completed using this technique in 1991–92, accounting for 63% of all cholecystectomies performed, with a further 3,557 (10.5%) attempted but completed using open surgery (Marshall, Clark & Hailey 1994). In 1992–93 this proportion increased further, with 73% of all cholecystectomies completed laparoscopically, while the proportion of procedures begun laparoscopically but completed using open surgery fell to 6.7% (Hailey & Hirsch 1993).

Table 4.22: *Estimated numbers of cholecystectomy procedures in Australia, 1987–88 to 1991–92*

Year	Open procedures	Laparoscopic procedures	Converted laparoscopic procedures[(a)]	Total cholecystectomies
1987–88	27,105	–		27,105
1988–89	27,050	–		27,050
1989–90	26,564	–		26,564
1990–91	24,369	3,221	537	28,397
1991–92	9,042	21,504	3,588	34,134

(a) Refers to procedures that were started laparoscopically and completed as open operations.

Source: Marshall, Clark & Hailey 1994

The number of cholecystectomies in 1991–92 was 26% more than the number in 1987–88, on a constant population basis (Table 4.22). Thus, after a period where cholecystectomy rates had shown little or no increase, the introduction and rapid diffusion of the laparoscopic technique were associated with an increase in the total number of cholecystectomies performed. A similar effect has been noted in Canada (Marshall, Clark & Hailey 1994) and in the United States (Steiner et al. 1994). The proportion of laparoscopic procedures converted to open operations has fallen as further experience with the technique has been gained.

Where procedures which would not have been attempted as open surgery are performed on frailer patients, the laparoscopic approach offers an important gain, although there is always the risk of needing to convert the laparoscopic procedure to open surgery. However, the technique may also be being used where open surgery is considered to offer inadequate benefits. The utility of such additional procedures remains unclear.

The performance of extra procedures erodes the potential cost savings offered by laparoscopic cholecystectomy. Preliminary reviews suggest that, although patients gain considerably through fewer days lost and reduced costs, savings to the health care system are much more limited (Marshall, Clark & Hailey 1994, Hailey & Hirsch 1993). These findings suggest a need for appropriate trials and clear guidelines for use of laparoscopic surgical techniques.

Another example of minimal access surgery is endometrial resection or ablation, an alternative to hysterectomy in the treatment of menorrhagia (excessive menstrual bleeding). This technique makes use of diathermy, lasers or radiofrequency devices. Since no incision at all is required, recovery is faster and hospital stays are shorter than for laparoscopically assisted hysterectomy. The use of hysteroscopic endometrial resection or ablation has spread rapidly; 2,342 Medicare benefits payments were made for it in the first six months of 1992. An impact on hysterectomy rates for menorrhagia is already discernible (Hirsch 1993).

Hysteroscopic resection or ablation offers significant financial advantages compared with abdominal hysterectomy (Hirsch 1993). The advantage depends upon the type of equipment used. Of the three methods introduced to Australia, diathermy (at about $1,500 per patient episode) is cheaper than either laser ($2,200) or the recently introduced radiofrequency ablation ($2,500). Since outcomes are reported to be similar, it is not surprising to find that 96% of procedures use diathermy.

Laparoscopically assisted hysterectomy is another minimal access technique that could replace some abdominal hysterectomy, although the extent to which it might do so is not yet known. It benefits patients through less pain, a faster recovery and a quicker return to normal activities. However, its financial impact is less clear. Although the laparoscopic technique is cheaper than the abdominal procedure ($2,960 as compared with $3,740), the difference is not great and could be less if hospital stays prove to be longer than those in early reports.

Replacement of open surgery by laparoscopic procedures affects hospitals in many ways. Hospital budgets must meet the cost of some disposable instruments and of additional laparoscopes, video equipment and laparoscopic instruments. Laparoscopic equipment is more difficult to clean and sterilise than that used for open surgery.

Shorter hospital stays have relatively higher administrative costs and increase the need for day care and post-discharge services.

A number of other issues also need close consideration. Although operative mortality rates for open and laparoscopic cholecystectomy are similar, technical difficulties in the laparoscopic procedure appear to be associated both with a number of deaths and a greater risk of bile duct injury (Crist & Gadacz 1993). This points to a need for adequate training in laparoscopic techniques and careful evaluation of the safety and efficacy of each compared with traditional techniques. Long-term re-operation rates for procedures such as laparoscopic hernia repair are unknown and could be a major factor in determining the cost-effectiveness and eventual acceptance of the procedure.

As the example of laparoscopic cholecystectomy illustrates, widening patient selection criteria could significantly reduce the savings to the health system offered by minimal access surgery. The probability that these savings will occur needs careful evaluation for individual procedures. Although minimal access techniques continue to make a big impact on current surgical practice, their net benefits for both patients and the health care system will not be known for some time.

Transplantation services

Organ transplantation is an area of medical technology in which significant changes continue. Kidney and corneal transplantations have been undertaken for many years and are standard clinical practice. Other forms of transplantation, such as lung and pancreas, are more recent and are still in development. The specialised and evolving nature of these technologies is reflected by the number which have received Nationally Funded Centre status (awarded to high-cost, low-demand services where there is a need to concentrate services in a small number of national centres). Lung and pancreas transplantation are supported in this way, and heart and liver transplantation have been.

Corneal transplantation has been used since 1941 and is being performed on an increasing number of patients, now over 1,000 per year (Table 4.25, page 186). It cures corneal blindness, with one-year graft survival rates of over 90%. Minimal immunosuppression is required to prevent rejection and the operation is relatively straightforward (Mitchell et al. 1993).

Table 4.23: *Percentage of all transplant recipients by age group*

Age group	Heart	Heart–lung	Lung	Liver
1–15	2.9	1.7	–	34.3
16–40	22.5	48.3	14.5	23.7
41–60	66.7	48.3	83.6	40.0
More than 60	7.9	1.7	1.9	2.0
All procedures	*418*	*60*	*55*	*460*

Source: AHTAC 1994, in press

Table 4.24: *Percentage of first kidney transplant recipients by age group, 1991*

Age group	Proportion of procedures undertaken
0–4	0.5
5–14	3.3
15–44	52.4
45–54	25.2
55–64	14.7
65–74	3.8
Number of first transplantations	*468*

Source: Disney 1992

Bone marrow transplantation is used to treat a number of conditions such as leukaemia and aplastic anaemia. Its use increased threefold from 1987 to 1992. Transplanted cells are previously harvested either from the patient (autologous) or from a living donor (allogenic). Donors can be either related or unrelated to the patient, with major tissue types matched closely to those of the recipient. This requirement for tissue matching, which is essential in bone marrow transplantation rather than simply desirable as in transplantation of other organs, means that large donor registries must be available to give a reasonable chance of finding suitable donors. An unrelated donor is usually sought only if no suitable related donor is available and an autologous transplant is inappropriate.

The difficulty in finding suitable donors is one reason why bone marrow transplantation is performed less frequently than might be expected. In the past, survival was poorer for matched unrelated donor transplants than for matched related donor transplants. Recent results suggest similar outcomes for the two groups of recipients (Atkinson 1992).

Table 4.25: *Number of transplantations, 1987 to 1993*

Type of transplant	1987	1988	1989	1990	1991	1992	1993
Bone marrow	174	188	225	247	368	506	560
Unrelated allogenic	3	2	2	6	32	23	27
Related allogenic	113	106	126	136	147	205	201
Autologous	58	80	97	105	189	278	331
Cornea	526	552	608	790	916	1,019	nya
Heart	28	52	84	98	98	101	105
Heart–lung	1	2	14	12	19	18	13
Kidney	391	466	491	443	468	459	442
Liver	30	63	100	80	116	140	127
Lung	–	–	–	5	18	36	56
Pancreas	3	7	7	9	8	10	11

Source: ACCORD 1994

Kidney transplantation is the most well-established and widely used solid organ transplantation. Young and middle-aged adults are the most frequent recipients (Table 4.24). Numbers of procedures are now steady in Australia at between 400 and

500 per year (Table 4.25, page 186). For the patient with end-stage renal disease, it offers greatest potential for restoration of renal functioning. Patient survival at one year was 93% in 1991, with graft survival at one year being 84% (Disney 1993). The number of functioning transplants in Australia continues to increase (Table 4.26), though there continues to be concern regarding the limited number of donor organs. However, kidney transplantation does carry the risk of premature death, kidney rejection and complications of immunosuppression, particularly infection and cancer. Advances in suppression of the body's immune system should reduce rejection and improve outcome.

Table 4.26: *Kidney transplants and renal dialysis, Australia and New Zealand, 1986 to 1992*

	1986	1987	1988	1989	1990	1991	1992
Australia							
Kidney transplant operations							
Number	438	391	466	491	443	469	476
Per million population	27	24	28	29	26	27	27
Functioning transplants[a]							
Number	2,388	2,567	2,790	3,042	3,253	3,480	3,699
Per million population	149	158	169	181	190	201	211
Patients on dialysis							
Number	2,343	2,537	2,688	2,759	2,963	3,140	3,360
Per million population	147	156	163	164	173	181	192
Percentage on CAPD[b]	28	30	31	30	29	29	30
New Zealand							
Kidney transplant operations							
Number	105	79	78	83	102	76	115
Per million population	32	24	23	25	30	22	33
Functioning transplants							
Number	426	452	484	531	579	605	675
Per million population	129	136	145	158	171	176	195
Patients on dialysis							
Number	401	437	484	530	558	628	666
Per million population	121	132	145	158	165	183	193
Percentage on CAPD[b]	42	42	44	46	50	53	56

(a) Excludes patients lost to follow-up for at least one year.

(b) Continuous Ambulatory Peritoneal Dialysis.

Source: Disney 1993

Liver transplantation is still increasing in use in Australia, with 138 transplants having been performed in 1992, but is nearing a plateau in technical development (AHTAC 1993). It is now part of the long-term management of chronic liver disease, but due to its technical and logistical complexity is unlikely to be available outside a limited number of centres.

Over the past three years, techniques have been developed for reduced-size liver transplantation, which allow child patients to receive transplants in the absence of size-matched donors and allow one donor organ to be used for two recipients. One-year actuarial survival rates in Australia are now reported as 76% to 86% compared with 72% to 78% in an earlier review of this technology (AHTAC 1991, 1993). As outcomes have improved and patient selection criteria widened, use of liver transplantation services has increased.

Heart transplantation has also become increasingly successful, with one-year actuarial survival rates of 86% to 90% in Australian units (AHTAC 1994). It, too, is part of the long-term management of end-stage cardiac disease but, again due to complexity with respect to logistics and patient care, is unlikely to be available outside a limited number of centres. The annual number of heart transplants has remained at around 100 in the last three years, with shortage of donor organs a major limiting factor. Most recipients have been in the 41 to 60 age range (Table 4.23).

Lung transplantation is evolving rapidly (Table 4.25). Initially, heart and lungs were transplanted together. This procedure was introduced to Australia in 1986 and is still the most appropriate form for a small group of patients, particularly young adults (Table 4.24, page 186). Single-lung transplantation was then developed and has replaced heart–lung transplantation for some conditions, including pulmonary fibrosis. Double-lung transplantation has progressed from en bloc transplant to bilateral sequential single-lung transplants as technical difficulties were overcome. This last procedure was introduced to Australia in 1992.

The developing status of lung transplantation is reflected in poorer outcomes than for heart or liver transplantation. In Australia, one-year actuarial survival rates are 70% to 75% for heart–lung transplantation and 61% to 78% for lung transplantation (AHTAC 1994). Overseas outcomes as reported by transplantation registries are even poorer: 59%, 69% and 62% for heart–lung, single-lung and double-lung transplantation respectively, compared with 78% for heart transplantation (Registry of the International Society for Heart and Lung Transplantation 1992).

The early stage of development of lung transplantation is also reflected in the changes in numbers performed since its introduction with five operations in 1990; there were 56 operations in 1993. Numbers of heart–lung transplantations have decreased from 1991 to 1993 and this trend is likely to continue as use of bilateral sequential single-lung transplantation becomes more frequent. Although the national caseload for lung transplantation is likely to increase, long-term outcomes are unknown; eventually this may affect caseloads.

Pancreas transplantation is unlike most other forms of transplantation in that it is not in itself life-saving. It is used primarily in the treatment of insulin-dependent diabetic patients with end-stage renal failure and is accompanied by kidney transplantation. Its benefit is that it reduces debilitating complications of diabetes, but it exposes patients to the risks of major surgery, organ rejection and side-effects of immunosuppression, so that the procedure is performed only about 10 times per year in Australia. Transplantation of the islets of Langerhans (insulin-secreting tissue) is being investigated as an alternative.

Donor supply is a limiting factor in most forms of transplantation. Long waiting lists for corneal and kidney transplantation and deaths while waiting for heart or liver transplantation indicate the impact of donor organ shortages. The cadaveric organ donor rate has remained fairly constant since the early 1980s, at 11 to 13 donors per million population per year (Chapman 1992). However, only a minority of those dying are suitable to be donors, and how the number of potential organ donors has changed, as a result of changes in road accident fatalities, for example, remains largely unknown. The Australian Coordinating Committee for Organ Registries and Donation (ACCORD) has been formed to address the shortage of cadaveric donors.

Donor pools vary with the different forms of transplantation due to a variety of factors. The potential corneal donor pool is large since age of the donor does not affect graft survival, eyes can be harvested up to 12 hours following death and a high proportion of the community supports eye donation (Coster & Williams 1992). Living donors add to the kidney donor pool, with 13% of the transplant operations performed in 1991 having used living donors (Disney 1992). Living donor liver transplants have also been performed but raise ethical issues such as risks to the donor and the possibility of pressure being placed on the potential donor, particularly in urgent situations (AHTAC 1993). Living donor lung transplants might also be possible in the future.

Access to highly specialised services such as transplantation is a problem in Australia because of the wide geographic distribution of the population. The problem is less severe for corneal transplantation, which is performed in smaller provincial hospitals as well as large teaching hospitals, and for kidney transplantation, which is performed in 24 Australian hospitals.

One purpose of granting Nationally Funded Centre status to liver, heart and heart–lung transplantation has been to provide equitable access for all Australians to the two or three units offering each of these services. Despite this national support, liver, heart and lung transplantation units have conducted transplants on more patients from their home States than from elsewhere. The reasons appear to lie in low rates of referral of out-of-State patients to the transplantation units and require further study (AHTAC 1994).

4.7.2 Emerging health technologies

Technologies in the treatment of benign prostatic hyperplasia

A minimal access procedure which has replaced open surgery can itself be challenged by more recent technological development.

Benign prostatic hyperplasia (BPH) is an enlargement of the prostate gland; it is present in most men over 50 years but without necessarily causing symptoms. When symptoms occur, they are of bladder outflow obstruction and urinary retention.

Transurethral resection of the prostate (TURP), an endoscopic surgical procedure, has been the standard treatment when BPH causes sufficiently serious obstruction. More than 20,000 TURPs are undertaken in Australia each year.

Although TURP is perceived as an effective operation, it can fail, re-operation may be needed, and there can be clinically important morbidity including sexual dysfunction. Also, patient opinion may often differ significantly from that of the urologist, with some men being reluctant to accept treatment.

For these reasons, less-invasive surgical and non-surgical managements of BPH are being investigated. Table 4.27 summarises the present management options. Several have long been available. Now, other technologies are being proposed as less-invasive alternatives which will reduce discomfort and complications, and perhaps provide savings to patients and the health care system.

Table 4.27: *Summary of management options for the treatment of benign prostatic hyperplasia*

Option	Description	Capital cost	Comments
Microwaves			
Hyperthermia	The tissue is heated either transrectally or transurethrally to between 42^{0}C and 44^{0}C.	\$10,000 to \$750,000	The use of this technique is decreasing, and thermotreatment is being preferred.
Thermotreatment	Tissue is heated transurethrally to temperatures ranging from 45^{0}C to 60^{0}C.		Short-term outcomes only are available.
Pyrotherapy	Ultrasound shock waves generated outside the body are used to destroy tissue.	\$1,130,000	The technology is in development.
High intensity focused ultrasound	Transrectal ultrasound heats the prostate to between 80^{0}C and 90^{0}C.	\$500,000	Clinical trials have begun in the USA.
Balloon dilation	A balloon catheter is introduced in the urethra and inflated.	\$1,000	The technology is still in development.
Laser irradiation	Energy deposition may be through bare fibre, a sapphire-tipped probe or a side-firing probe.	\$150,000	The technologies are still in development.
Medical treatment			
Hormone therapy	This therapy blocks testosterone's growth-stimulating effect on the prostate.		Lifetime commitment and compliance is required.
Alpha blockers	These drugs affect the muscular tone of the prostate capsule.		As above
Ultrasonic aspiration	The device disrupts the tissue by repetitive striking, and fragments are aspirated.	\$40,000	The technique is still in development.
Transurethral needle ablation	RF waves are passed through two needles in contact with the tissue.	\$40,000	Results not yet available.
Cryosurgery	Sub-zero temperatures are used to destroy tissue.		Results not yet available.
Surgery			
Open surgery			Used for large prostates.
Transurethral resection	Electro-cautery is used to cut the prostatic tissue.		This is the most common procedure for BPH.
Transurethral incision	Incisions are made in the bladder neck.		Suited to small prostates.
Stents	Expandable tubular mesh or removable spiral stents dilate the urethra.	\$2,000	Considerable morbidity has been reported.
Watchful waiting	The natural history of BPH is not well understood. BPH usually does not progress from mild to a more severe form.		Observation without surgical treatment is a more reasonable option than previously believed.

Source: Dankiw & Hailey 1993

Health authorities, hospitals, urologists and their patients will ultimately have to choose from several alternatives. Most of them are still at a relatively early stage of development, and the newer methods may not necessarily be superior. Improvements in objective symptoms, such as flow rates, following use of most of these technologies are generally not as good as those experienced after TURP. However, the incidence of sexual dysfunction following the newer procedures appears to be lower although these are short-term findings. Technical progress with a number of devices continues.

It may turn out that some of the newer technologies provide relatively short-term relief and that TURP will eventually be needed for some patients. Deferring TURP in the short to medium term may be an important consideration.

As most men with minimal symptoms of BPH seek medical advice, and the less-invasive alternatives are appealing, there can be a demand for procedures of unproven value. The newer methods may extend the indications for intervention for BPH, adding to health expenditure for an uncertain benefit to health.

Telemedicine

Telemedicine, which involves the use of telecommunications to link general practitioners, nurses, patients and specialists, is being used on an experimental basis in Australia and, following trends in Europe and America, is likely to become available for general use within the next few years. The associated technology is improving rapidly, although a number of social and professional issues need to be resolved before telemedicine becomes widely used.

Remote consultations

Telemedicine offers the opportunity for medical consultation and preliminary assessment prior to action such as air evacuation of a patient to a base or city hospital. The remote consultation may involve a doctor and patient at one end, and a specialist at the other, connected by telephone while viewing each other on television monitors with the facility to transmit medical notes, pathology reports or X-ray images.

Recent developments in high-speed telecommunications and computers allow consultations to take place between two parties using personal computers rather than the more expensive television monitors. A number of evaluation studies are being undertaken of the use of remote consultation facilities. An example of a successful project was the linking of the Whyalla Base Hospital and Royal Adelaide Hospital for the provision of remote psychiatric consultation services. In a changing technical and economic environment there is a need for ongoing evaluation to determine the benefits to patients of the use of remote consultations, and their costs.

Privacy and security considerations

Many people accept that it would be in their interests if their medical information could be readily transferred to another location. For example, if they were to fall ill or be involved in an accident while travelling and were in need of medical or hospital treatment, then the immediate availability of their medical history, including, for example, details of drug allergies, could result in better management. Just as customers expect their financial details to be available at each branch of their bank, so patients might expect their key medical details to be available at every treatment facility.

Telecommunications offer the prospect of improved patient care through the transfer of patient information between practices and imaging facilities, such as those at hospitals and rehabilitation centres. However, the successful introduction of this form of telemedicine requires maintenance of patient records in computer-readable form. Also, while the ready transfer of patient information is desirable, present concerns about privacy and security of medical data require that details of a medical condition should not become known without the consent of the patient. There is a legitimate community concern that data stored on individuals, and particularly sensitive personal data such as a medical history, should be secure. Discussions are in progress among the several parties involved in the issues of appropriate standards, privacy safeguards, and professional responsibilities for patient management.

Provision of the required level of security is presenting a challenge to the computing industry in designing systems which are both fault-tolerant and secure, and at the same time are relatively easy to use and low in cost. It is likely that discussions between professional bodies, governments and patient and community representatives will continue for some time before a satisfactory solution is developed.

The Health Communications Network (HCN) established recently by the Commonwealth Government will, as one of its objectives, provide a forum for discussion of these matters. The HCN is currently managing a number of pilot projects, collecting information on the problems that are likely to be encountered in the provision of services such as telemedicine.

The future

A great deal of work is yet to be done in the area of standards for medical records, legality, acceptability of computer-based records, security, user education, the accurate identification and linkage of patient records, and the need for evaluation and cost-effectiveness studies. Nevertheless, it needs to be recognised that developments in telecommunications and computer technology present interesting possibilities for telemedicine.

A number of related developments, such as the proposed introduction of cable television and of the video telephone, provide sufficient bandwidth for home consultations. Many patient queries can be as well answered by telephone as by a visit to a doctor. Clearly, existing administrative and financial reimbursement arrangements would have to be considered if video telephone consultation were to be introduced.

Other services, such as the monitoring of alarm devices, could also be performed by the connection of transmitters to the home telephone. For example, the operation of a cardiac pacemaker could be monitored. Also, the analysis of previous history, unique to each patient, could detect changes in cardiac performance and monitor the effects of cardiac medication.

Successful use of technology has other requirements. In the scenario described above, while it would be possible to transmit a patient's electrocardiographic patterns to a computer in a central hospital, there is the need for analysis and reporting to ensure appropriate patient management. Thus there is a need for administrative, legal, professional and financial arrangements to integrate the home-based telemedicine facilities with the patient management systems which have been established over many years. Arranging for these will not be simple, but must be done before the potential of telemedicine can be fully realised in the Australian health system.

Use of lasers in medicine

The most important use of lasers is in eye surgery, particularly for treatment of detached retina. They have also been used in tattoo removal, and more recently for treatment of some skin blemishes. They are also used to treat some diseases of the cervix (Table 4.28).

Table 4.28: *Lasers—number of Medicare services, 1984–85 to 1991–92*

Procedures	1984–85	1985–86	1986–87	1987–88	1988–89	1989–90	1990–91	1991–92
Dermatology	–	–	–	–	6,743	7,821	7,964	7,634
Ophthalmology	17,017	23,262	27,122	29,785	33,768	39,567	44,533	58,131
Gynecology	–	–	–	–	8,076	12,633	11,038	11,308
Gastrointestinal tract	–	–	–	–	–	–	–	99
ENT	–	–	160	239	225	256	348	296
Total	**17,017**	**23,262**	**27,282**	**30,024**	**48,812**	**60,277**	**63,883**	**77,468**

Source: AIHW 1993a

Laser systems are devices that emit parallel, coherent beams of radiation which can be focused to a small diameter, and can produce a high power-density. The various tissue interactions that take place with laser light of different wavelengths offer potential treatment of a range of conditions.

Although lasers have been used in medicine for some time, in many applications their place has yet to be established. Few laser applications have been fully evaluated in terms of clinical efficacy and comparative advantage over alternative methods (Dankiw, Hailey & Angel 1993). They have secured a dominant position in relatively few areas. Despite the high hopes and great promise of this technology, the number of lasers in medical use in Australia is small. The number of high-powered devices increased from 64 in 1983 to 289 in 1991, and there are also about 2,000 low-power lasers in use.

The variety of lasers available for medical use has increased substantially over the last decade and, more recently, new lasers have begun to move from research to clinical use. Low-power lasers have become more widely used, although their role in medicine is less clearly defined.

Barriers to the adoption of lasers have been uncertainties over cost, and perceptions of limited advantage over alternative methods. The uncertainty is compounded by the fact that 'it is not simply a case of laser technology rapidly developing in a search for superiority over static conventional therapies; in reality, laser technology in many clinical areas is competing against equally new and rapidly developing technologies' (Sculpher & Buxton 1991). Possible concerns about training and safety have added to the uncertainty.

The use of lasers in medicine can be expected to expand and become more firmly established. The newer types of laser promise more selective applications and greater convenience, although some devices will also have a higher cost. Intending marketers and users of lasers will need to establish not only that they are effective, but that their cost-effectiveness and convenience warrant the acquisition of a new device which may require changes to established practice routine. In general, those considering using lasers need to assess the procedure as a whole, comparing the laser with alternatives and identifying all costs.

The effects on established routine may be a significant barrier to laser use. In some institutions, arguments against adjusting an established and efficient infrastructure and practice may militate against the use of lasers. There may also be practical difficulties when different departments within a hospital are sharing a laser facility.

The economic reality is that it would be very difficult to justify one laser for a single application in a large public hospital, except possibly for ophthalmology and for obstetrics and gynaecology.

New technologies for screening for cervical cancer

Screening for cervical cancer employs the Papanicolaou (Pap) smear test. This is a well-established technique that has been used for over 30 years. Its principal advantages are that a smear can be taken locally by a doctor or nurse, costs are low and the procedure is simple, quick and safe. Disadvantages of the Pap smear include problems of inadequate sampling and the limited sensitivity and specificity of the test.

Sometimes a Pap smear may fail to detect abnormality. The reported incidence of such false negative results varies from 15% to 55% and depends on the severity of the lesion. For CIN3 (Cervical Intra-epithelial Neoplasia grade 3), the most important lesion which routine screening aims to recognise, a false-negative rate of 15% to 20% is to be expected. There are numerous inherent opportunities for error that can lead to an unacceptably high false-negative rate. Poor sampling technique has been suggested as being responsible for about half of false-negative results, and errors in laboratory diagnosis for the remainder.

Because of these disadvantages, there is interest in applying new technologies to screening for cervical abnormalities.

Technologies for taking smears

A variety of implements, ranging from the wooden spatula to specially designed brushes, are currently used to collect samples from the cervix. The cells collected on these implements are then streaked upon a glass slide. This process can suffer from a number of errors. The transformation zone of the cervix may be inadequately sampled, the collected cells may be too heavily layered on the slide, or an inadequate number of cells may be applied. The absence of different types of cells may also cause the slide to be rejected by the laboratory. Some new brushes appear to improve the reliability of sampling.

As the preparation and reading of Pap smear slides are laborious procedures and subject to human error, systems are being developed that reduce the involvement by cytotechnologists and produce better quality slides.

There are two new methods of slide preparation, both of which require the collector of the specimen to wash the collected cells into a vial of alcoholic fixative (Braggert et al. 1993). The vial is then sent to the laboratory where the slides are produced using either of the two new instruments.

Performance data on the two devices are shown in Table 4.29 (page 195). They show an improvement over the Pap smear procedure, although the false negative rate is still quite high for a screening procedure. These figures represent the performance under laboratory practice conditions as applied in the United States of America, and trials are required to establish the place of this technology in Australian cytology laboratories.

Table 4.29: *Data on automated slide preparation*

	'Thin Prep' (Cytyc)	'Cyto–Rich' (Roche)
Agreement with Pap smear test	77.4–91.9%	90.3%
Agreement within one grade	97.2–99.8%	97.2%
Sensitivity	Thin Prep: 57–74% Pap: 46–67%	
Specificity	Thin Prep: 76% Pap: 77% (Biopsied patients)	
Additional lesions detected	e.g. 9 high grade, 42 low grade out of 2,655 smears	

Source: Braggert et al. 1993

Automated slide screeners

The desire to remove some of the possibility for human error and to reduce the labour component of the screening process has led to the development of automated slide readers. These consist of a video camera mounted on a microscope with a computer-controlled microscope stage. An automatic slide loader is incorporated so that the instrument can scan the slides by itself. The computer software translates the information on the slide to identify pre-cancerous or cancerous cells. These high-cost devices are still at the developmental stage, and are not yet available in Australia.

All these automated scanners require human review of any abnormal or suspicious cells. The images and positions of these cells are stored in the memory of the computer for the technologist to review prior to reporting the findings. This means that only the negative results would be reported on the basis of the instrumental findings. A proportion of the negative results would be reviewed by the cytotechnologists as a quality control measure.

The economies of this new technology are complex. Some of the factors which need to be considered in any decision to introduce it are that the slide preparation instruments cost approximately $50,000 and the consumables cost approximately $5 per test. The time taken to read a machine-prepared slide is approximately half the time to read a conventional Pap smear slide, although more time is required within the laboratory to prepare it. The automated screening instruments may cost approximately $300,000.

Direct visualisation techniques

Cervicography is a photographic technique being used in the United States to identify lesions of the cervix. The slides developed from the photographs are reviewed by trained colposcopists using a magnification of approximately 16 times, and results are reported to the clinician. Although some see cervicography as a replacement for Pap smear technology, it seems possible that this technology will be used in addition to the

Pap smear. A cerviscope costs US$3,200, with patients being charged $20 to $50 per test.

Another direct visualisation technique currently being developed in Australia monitors electrical and optical properties of cells and compares the findings with those from normal cells. A diagnosis is then made and follow-up procedures instigated immediately, should they be deemed necessary. This instrument also is in the early stages of development and little information is available in the refereed literature.

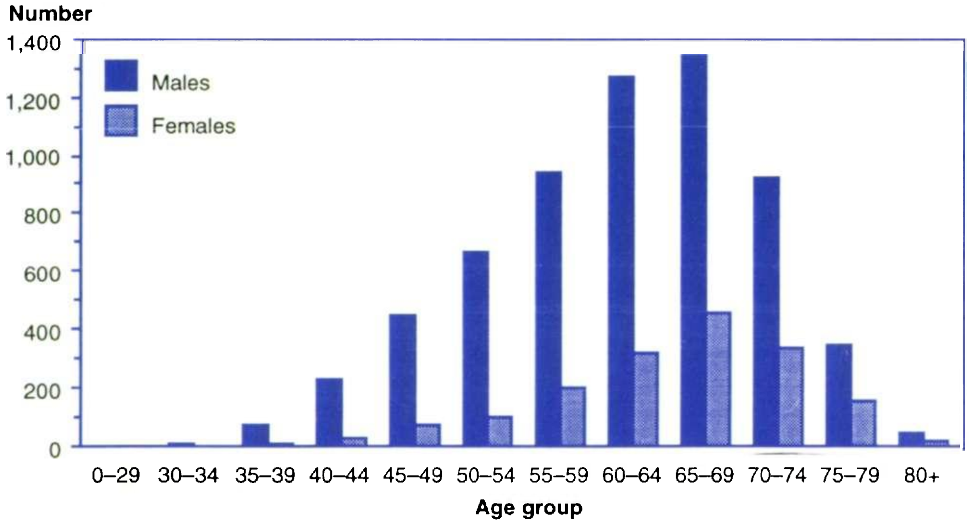
The place of these technologies in cervical cancer screening still needs to be established. The Pap smear is still the technology with which these new methods are compared and may itself have scope for improvement.

To date, no cost-effectiveness studies have been performed to assess the economic benefits of the new technologies. Careful consideration will be needed to determine whether the additional costs of these approaches can be justified by the benefits they offer in terms of improved accuracy, particularly in the context of screening programs with limited resources.

4.7.3 Technologies in aged care

In 1989, 11% of the Australian population were aged 65 or more. By the year 2031 the proportion will have risen to over 20% (ABS 1990).

Health care technologies add to the potential for improving health and quality of life in older people, but they also have their limitations. The following topics provide examples of the issues which can arise.



Note: Public hospital data only for Vic, public and private hospital data for NSW and SA

Source: AIHW, derived from State health authority data

Figure 4.9: *Number of CABG procedures performed in 1991–92 for New South Wales, Victoria and South Australia combined, by age group*

Major surgical procedures

An example of a major procedure is coronary artery bypass grafting (CABG). It was once considered too risky for patients over 70, but is now used increasingly at higher ages. Figure 4.9 (page 196) gives the age and sex distribution of patients who underwent CABG in New South Wales, Victoria (public hospital patients only), and South Australia in 1991–92. While 42% of the patients were from 60 to 69 years, 23% were aged 70 or more, and some patients were 80 years or over.

Decisions on surgery for the very elderly are based more on a patient's condition and risk of complications than on age.

Implants and prostheses

Implants and prostheses are having a substantial impact on the health care of the elderly. Examples of those most commonly used are intra-ocular lenses, prostheses for total joint replacement, and cardiac pacemakers.

Intra-ocular lenses are used in the treatment of cataracts, in which opacification of the natural lens of the eye causes impairment of vision and blindness. Lens replacement has had a dramatic impact on quality of life for the elderly, having saved many from partial or complete blindness. In 1991–92, Medicare benefits were claimed for over 38,000 lens replacements, 81% in patients aged 65 or more.

Nearly 39% of Australians who are 65 years or older suffer from arthritis (ABS 1991b), and pain and disability may become severe enough to warrant joint replacement. If successful, this relieves pain and substantially improves mobility.

Although the great majority of cases involve hip and knee replacements, prostheses are also available for the shoulder, elbow, wrist and ankle. Around 18,000 total joint replacements are performed in Australia every year, at a total cost to health care of over $200 million.

Joint replacement is most commonly performed on the elderly. For example, in New South Wales in 1991–92, there were 3,433 primary total hip replacements, 75% of which were on patients aged 60 years or more, including 44% who were 70 or more.

For hip and knee replacements, short-term results are reported to be good or excellent in 90% of cases (Harris & Sledge 1990a, 1990b). A major long-term complication is loosening of the prosthesis. This can result in the need for revision operations, which are more difficult and less successful than primary procedures. Considerable effort has been devoted to the development of new, more costly implants to overcome these problems, but it remains uncertain that they give superior long-term performance.

Cardiac pacemakers are electronic devices that deliver electrical stimuli to the heart to treat heart rhythms which are abnormally slow or abnormally fast. The first implantable pacemakers were developed in the 1950s. Since then, there have been major advances in the technology (Zipes & Duffin 1988).

In Australia, the rate of pacemaker implantation is rising steadily. In 1984–85 there were 559 Medicare claims for pacemaker implantations. In 1991–92 there were 1,454. As the population ages, the demand for pacemakers is likely to increase.

A characteristic of the evolution of pacemaker technology has been that, as new developments were introduced to overcome problems with previous models, new problems arose. For example, devices developed in the 1960s caused a condition called pacemaker syndrome. Later devices could cause pacemaker-mediated tachycardia, a problem that has been largely but not completely resolved. Further improvements in the technology are expected (Shakespeare & Camm 1992).

Minimally invasive therapy

Recently, less or non-invasive techniques (discussed above, page 183) have replaced many conventional surgical procedures. This trend has particular implications for the elderly, who are among those most at risk in conventional surgery. Not only do minimally invasive techniques reduce risks and improve recovery for the elderly, they may also allow patients who might not have been able to undergo treatment by conventional surgery to be treated without excessive risk.

Examples of minimally invasive techniques include laparoscopic surgery, catheter-based techniques, and non-invasive procedures such as extracorporeal shock wave lithotripsy (ESWL).

There are limitations which need to be kept in mind. For some procedures, for example cholecystectomy, the minimally invasive approach needs to be converted to open surgery in a proportion of cases. Selection of patients must recognise this.

One of the most commonly used catheter-based techniques is percutaneous transluminal angioplasty. It is used principally in the treatment of coronary artery obstructions, and of obstructions in arteries to the legs. Angioplasty can only be applied to certain types of obstruction and many patients with cardiovascular disease would not benefit from its use. In addition, although initial success rates are high, there is a high rate of recurrence of obstruction. It can be difficult to be sure that the patient's symptoms are caused by an obstructed artery, and sometimes treatment of the obstruction does not relieve symptoms.

ESWL has become standard procedure for treating kidney stones. Its use for biliary stones is quite limited, due in part to the advent of laparoscopic cholecystectomy. However, it has a role in treatment of elderly patients with suitable biliary stones who are unfit for general anaesthesia.

Pharmaceutical treatments

Use of pharmaceuticals increases with age (ABS 1991b). Many elderly people suffer from more than one condition, and have a number of different medications on prescription. Older people are physiologically at greater risk of adverse reactions to pharmaceuticals. The risk increases with the number of drugs taken.

In a study of elderly people in Sydney, 27% of those living in their own homes, and nearly half of those living in nursing homes or hostels, were taking four or more regular medications. For the institutionalised elderly, prescription of psychotropic drugs (tranquillisers, hypnotics, antidepressants, and so on), was high compared with other countries (Snowdon 1993).

A high proportion of older people have been exposed to the risk of an adverse drug reaction through prescription of drugs unsuitable for older people, combinations of drugs with adverse effects, or excessive duration of therapy (National Health Strategy 1992).

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5 Health information and statistics: sources, developments and deficiencies

5.1 National Health Information Agreement

In February 1991, the Institute convened a Forum on Priorities for National Health Statistics which recommended an agreement between the Commonwealth, States and Territories to improve cooperation in the development, collection and exchange of national health data.

In May 1993 the Australian Health Ministers' Advisory Council (AHMAC) endorsed the National Health Information Agreement, subsequently signed by the heads of the Commonwealth, State and Territory health authorities, the Australian Bureau of Statistics and the Australian Institute of Health and Welfare. It came into operation on 1 June 1993 and is being implemented under AHMAC's authority.

The Agreement indicates acceptance of a national approach on health information in Australia's federal health care system. It will lead to uniformity or at least a high degree of compatibility of data collected in different parts of the system. The Agreement also signifies a public commitment by Commonwealth, State and Territory health authorities to adopt national definitions and to improve Australia's health information.

Objectives

The National Health Information Agreement sets out to provide a national framework and mechanisms to improve the collection, quality and dissemination of national health information.

Objectives of the Agreement include:

- promoting the collection, analysis and dissemination of quality health information on all health services and on a range of population variables (including health and risk factors), in accordance with nationally agreed protocols and standards;
- developing projects to improve, maintain and share national health information;
- cooperating in the provision of resources and information required to address national health information development priorities efficiently and effectively;
- promoting the expansion of national health information and encouraging other groups and government and non-government sectors to participate and share information that they hold.

The Agreement also aims to improve access to uniform health information by community groups, health professionals, and government and non-government organisations. While improving access to data using information technology is a goal, the Agreement will improve the data collections available and, from joint efforts, lead to new ones. A critical strategy for improving the current collections is setting national data definitions and standards. By recognising the National Health Data Dictionary (see below) as the authoritative source of national data definitions, the Agreement has gone a considerable way to achieving this aim.

A further role for the Agreement is to provide a sense of direction for the development of national health information. There are also a number of health information policy issues that have broad national implications, including privacy, charging, data access and linking of data; it is important that these matters be addressed nationally.

The Agreement recognises the need for a broader national perspective that encompasses the private and non-government sectors, providers, the community and researchers. Initially, however, it is between the Commonwealth, State and Territory governments, and is mainly concerned with health information issues in the public sector. The rationale for this approach is that governments provide or finance most health services, largely fund the training of health professionals, and are the major producers and users of health information. Obtaining the participation of and commitment by governments to improving national health information is clearly the first and most crucial step to any broader agreement.

A National Health Information Management Group consisting of senior representatives of all signatories develops and oversees the Work Program to be carried out under the Agreement. It meets at least twice a year, and receives progress reports from each authority responsible for a project. It reports to AHMAC six-monthly on the Work Program progress and annually on national health information developments. The Institute provides the Management Group with technical and secretariat support.

AHMAC's role in respect of national health information is to approve major policy and funding aspects, including the Work Program that incorporates the national priorities and to receive the annual review of the Work Program with the recommendations of the Management Group.

National Health Information Work Program

The major implementation mechanism of the Agreement is a National Health Information Work Program of health information activities with a national perspective or national implications. The activities range from development work on standard charts of accounts, on health outcome measures and on new collections such as mental health, to improved definitions and enhancement of existing collections such as vital statistics and morbidity data. Many of the issues to be addressed through the 1993–94 to 1995–96 Work Program are those identified by the 1991 Forum on Priorities for National Health Statistics.

The 1993–94 Work Program lists nearly fifty projects that are accepted by the parties to the Agreement and are in accordance with agreed national priority areas. These priority areas are:

- Health services
  - —institutions
  - —primary care and community health
  - —mental health
  - —medical services
  - —health service outcomes

  - —pharmaceuticals
  - —health insurance
  - —national health expenditure
  - —health labourforce
- Health status
  - —vital statistics
  - —population surveys
  - —surveillance
  - —population health outcomes
- Health information
  - —national health information policy and infrastructure
  - —National Health Data Dictionary

The National Health Data Dictionary is a key element of the Work Program. The NHDD for institutional health care, published by the Institute in 1993, represents a major step forward in providing an authoritative set of national definitions. The Work Program envisages the expansion of the NHDD to other major health areas including the health labourforce, primary care and mental health.

Development of the NHDD will be coordinated through the National Health Data Committee (NHDC) supported by the National Health Information Unit at the Institute. The Unit is funded jointly by the Institute and AHMAC.

Inclusion in the Work Program indicates that the project is either currently under way or will be begun within the time frame of the Work Program. Responsibility for each project has been assigned to a party to the Agreement. Each party accepting the responsibility has agreed roles and responsibilities that include addressing the issues from a national rather than a State or Commonwealth perspective, consulting broadly, reporting to the Management Group and using agreed national data definitions and standards.

A key measure of the success of the Agreement will be the political and resource commitment of the signatories to the Work Program projects.

Future developments

Although the current Agreement is between government agencies, the importance of the private for-profit and not-for-profit sectors, academic bodies, community organisations, and others, is recognised by all signatories. A major challenge will be to identify and obtain agreement on priorities for the information needs of these diverse interests.

Major challenges will arise in developing information relating to social, behavioural and environmental factors that affect health and illness. These issues pose substantial methodological, ethical and information practice (storage, transport and data access) questions.

5.2 Commonwealth agencies and national health statistics

Many Commonwealth Government agencies have interests in national health statistics. Those with broad interests are the Australian Institute of Health and Welfare (AIHW), the Australian Bureau of Statistics (ABS), and the Department of Human Services and Health (DHSH). Other agencies, including Worksafe Australia and the Department of Veterans' Affairs, have specialised interests.

Australian Institute of Health and Welfare (AIHW)

The AIHW is an independent Commonwealth statutory authority which undertakes statistical and research work in the areas of health and welfare. Its functions are to:

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

Much of the data used by the Institute in pursuit of its objectives comes from the States and Territories, or from the Australian Bureau of Statistics. A detailed discussion of the AIHW structure and role was provided in *Australia's health 1992*. The description following mentions significant developments since 1992, and perceived needs for the future.

Health Monitoring Division

The Health Monitoring Division monitors and evaluates the health of all Australians and population subgroups.

During the last two years, there have been significant advances in the timeliness of data holdings, particularly the National Death Index (see Section 5.3), national cancer statistics, and mortality data.

The Division published the first two of a series of mortality surveillance reports identifying trends in mortality from a wide range of causes of death. It is also developing monitoring strategies for national health goals and targets (see Section 1.5, page 65) and a comprehensive set of health indicators.

The Division has played a major role in negotiations and development of proposals for a national dietary survey to be conducted in conjunction with the 1994–95 ABS National Health Survey (see under Department of Human Services and Health later in this section). As part of its work to develop ongoing monitoring and surveillance of the food system and its responsibility to report publicly on progress towards meeting food and nutrition goals and targets, the Institute has produced a benchmark report—*Australia's food & nutrition*—released earlier in 1994.

Health Services Division

This Division is responsible for developing, collecting and analysing statistics and information on the provision and use of health services in Australia.

Following the 1991 Forum on Priorities for National Health Statistics, the Health Services Division had responsibility for development of the National Health Information Agreement proposed there (see Section 5.1).

Work continued on the National Health Data Dictionary including definitions for institutional health care, mental health, casemix classifications and health labourforce.

Significant progress was made on the National Health Labourforce Collection. The publication in 1994 of national reports on the characteristics and workforce activities of registered nurses, medical practitioners and pharmacists, will be the culmination of three years work in obtaining agreement from health authorities and registration boards on data definitions and on provision of data to the Institute. AHMAC funded a significant part of the development work.

The Hospital Utilisation and Costs Studies moved from two-yearly to annual reporting starting with the 1991–92 collection. Unfortunately, little progress was made in reducing the time from the end of the period covered by each report to its publication date. The National Health Information Management Group is seeking to ensure more timely provision of data in future.

Health expenditure publications continue to be among the most sought after of the Division's publications. Work has started under the National Health Information Agreement Work Program to standardise classification of health services financial reporting. This should improve the timeliness of reporting of health expenditure data.

The Australian Health Outcomes Clearing House was established to help in the measurement of health outcomes and to act as a focus for methodological work on measurement (see section 5.6).

During the two years under review, the Institute entered into a collaborating arrangement with the University of Wollongong. Collaboration has included the development of definitions relating to acute inpatient care. Other work for the Casemix Development Program of the Department of Human Services and Health has related to casemix classifications for rehabilitation services and for the services of allied health professionals. Exploratory work has been undertaken for an operations research model of hospital waiting lists.

The 1992 Budget provided for the Institute to develop national reporting of hospital waiting lists. Several discussion papers were published in early 1993 and an interim report in early 1994. The first national report based on uniform definitions is planned for late 1994.

A survey of quality assurance activities in hospitals was undertaken in 1993.

Health Technology Division

The Health Technology Division assesses the costs, effectiveness and distribution of health care technologies in Australia. It is also developing a database on the use and distribution of health technologies.

A model for costs of disease has been developed (see Section 1.2.5). A health technology statistics bulletin (HealthTechStats) has been established. It provides statistics on the distribution, level and trends in the use of health technologies in Australia. The major source of data is the Medicare database, but industry and institutional sources are increasingly being used.

Welfare Division

The work of this Division relates more to welfare services statistics than to health statistics. However, a significant achievement in both fields has been development of a National Minimum Data Set for services funded under the Commonwealth–State Disability Agreement. The data set includes a data collection form, a data dictionary, and supporting instructions. A pilot test was conducted early in 1994 and the first national data are expected late in 1994.

Dental Statistics and Research Unit

The Unit is working to improve the range and quality of statistics on the dental labourforce, dental practice, dental illness, and use of dental services.

Significant progress has been made towards national collections and reports in two of the main data collections maintained by the Unit. All States and Territories are now contributing to the National Dental Labourforce Data Collection and national reports are in preparation for 1993 onwards. National reports from the revised Child Dental Health Survey have been published for 1989 and 1990 and further reports have been prepared for comment.

The Child Dental Health Survey has been augmented by a supplementary research project, the Child Fluoride Study. This study extends the oral health and social data available, permitting the precise estimation of disease incidence for specific social and cultural groups within the community and for groups receiving different patterns of care. The study will continue until 1995.

The Unit has also made progress on improving the data available on oral health and use of services among adults. Two surveys, the National Dental Survey and Adult Dental Programs Survey, were proposed in 1992 and tested in a consultancy to the Department of Health, Housing and Community Services (now the Department of Human Services and Health, DHSH) in 1992–93. They generated high-quality data on issues pertinent to policy on dental care for adults. The data also served as a basis for the planned National Evaluation Project for the Commonwealth Dental Health Program. The Unit is conducting the National Evaluation Project over 1994–97, under contract to DHSH.

National Injury Surveillance Unit

This Unit (NISU) seeks to make information necessary for injury control available to those who can use it.

Since 1992 NISU has initiated improvements in injury surveillance data collection, notably a minimum data set for injury surveillance. It has also developed methods for routine reporting of injury mortality and morbidity data, continued to compile injury data, provided numerous reports based on injury data to inquirers, and produced bulletins and a major descriptive survey of injury in Australia.

Road injury has received special attention through the Road Injury Information Program (see section 2.6, page 100). NISU is undertaking a program of research and publication which is improving the understanding of road injury (especially non-fatal injury) to guide improvements in road safety. Reports to date describe road injuries requiring emergency department attendances and admission to hospital, describe and analyse deficiencies in blood alcohol data, examine the potential of insurance company data to contribute to road safety, and investigate needs for data on exposure to road injury risk factors.

NISU completed a major consultancy for the Department of Human Services and Health and produced reports on the occurrence and circumstances of injury in Australia, and on programs and activities for the control of injury. The reports provide a more complete description of injury in Australia than previously available. Attention was given to transport injury, injury in rural settings, domestic injury, sports injury, injury involving consumer products, occupational injury, interpersonal violence, self-inflicted injury, injury in Aboriginals, health promotional programs, injury treatment services, rehabilitation, and injury control activities outside the health sector.

National Reference Centre for Classification in Health

The Centre was established in 1992 as a result of the World Health Organization appointing the AIHW as a Collaborating Centre for International Classification of Disease. The Reference Centre assists the Institute in its role as a Collaborating Centre. The Reference Centre, located at the Queensland University of Technology, has close links with the Queensland Department of Health and the Queensland office of the Australian Bureau of Statistics, which has recently become the location for centralised coding of mortality within the Bureau.

The Reference Centre has a major role in the introduction of the tenth revision of the International Classification of Diseases (ICD-10) into Australia.

National Perinatal Statistics Unit

The AIHW National Perinatal Statistics Unit (NPSU) at the University of Sydney was reviewed in 1993. The review recommended, and the Institute later accepted, that the goal of the National Perinatal Statistics Unit should be to provide national leadership in development and study of statistics relating to perinatal health. The objectives of the Unit were recast to become, in order of priority:

1. to monitor and interpret national perinatal mortality and morbidity;
2. to provide a limited perinatal epidemiology service; and
3. to conduct epidemiological research.

The collection, analysis and dissemination of mortality and morbidity data (including congenital malformation data) relating to the perinatal period was to become the primary activity of the Unit.

As a result of these decisions, the direction of the Unit's work changed substantially in 1993–94.

Australian Bureau of Statistics

The ABS is the central statistical authority for the Commonwealth Government and under the *Australian Bureau of Statistics Act 1975* has responsibility for the collection, compilation, analysis and dissemination of statistics and related information; ensuring coordination of the operations of other official bodies in the area (to avoid duplication, attain compatibility and encourage maximum use of statistics); developing and maintaining standards for statistical collections; and providing international liaison in relation to statistical matters.

In health statistics, ABS is responsible for providing and supporting the production of statistical information on the health of Australians (including disease prevalence and causes of death, and risk factors), their use of and need for health services, the cost of health services, and the health labourforce.

During the last two years, the ABS has continued its regular publications of, for example, summary statistics of causes of death. It has also contributed to the major developments in health statistics described below.

Causes of death

Planning is under way for the implementation of ICD-10 and the introduction of automatic coding of causes of death, expected to occur in 1995, subject to the availability of documentation and training materials from the World Health Organization.

Work is proceeding on plans to link births, deaths and midwifery data to provide an ongoing national linked data source to facilitate research and analysis into events from birth to age 2 years.

National Health Survey

The aim of this series of five-yearly National Health Surveys is to provide national benchmarks covering a range of key health indicators, and to enable trends in health to be monitored over time. The first survey in the series was conducted in 1989–90. Initial results were released in 1991. During 1992 and 1993 three major sets of publications were released: *Health status indicators* (Catalogue nos 4370.0–4374.0), *Health related actions* (4375.0–4379.0) and *Health risk factors* (4380.0–4384.0).

The second survey in the series will be conducted during 1994–95. From early 1993, the ABS has been engaged in the development of this survey, including extensive consultation with data users to ensure that, as far as possible, the survey addresses priority data needs.

Social Health Atlas

The *Social health atlas of Australia*, released in two volumes during 1992, brings together an extensive range of health information. Using results of the 1989–90 National Health Survey, it describes for regions the relations between health and socioeconomic characteristics on a regional basis. The atlas was produced by the South Australian Health Commission under the auspices of the National Better Health Program, and with the assistance of the ABS.

Aboriginal health

Health is one of the broad subject matter areas being covered in a national survey of Aboriginal and Torres Strait Islander people to be conducted from April to June 1994. During 1992–93 the ABS conducted widespread consultation with Aboriginal and Torres Strait Islander organisations, State and Commonwealth government agencies and research organisations to determine priorities for collection of data on Aboriginal and Torres Strait Islander populations.

The ABS, in collaboration with AIHW, is preparing a report on the health of Australia's Aboriginal and Torres Strait Islander people. It is based largely on data from the 1989–90 National Health Survey but also includes information from the 1991 Population Census and the ABS vital statistics collections. Subjects covered include health, risk factors, health-related actions including use of health services, life expectancy and mortality, reproduction and associated health issues.

Women's health

The publication *Women's health* (Catalogue No. 4365.0) is a comprehensive social report relating to the health of Australian women. It brings together information from a variety of sources including ABS collections, information from the Department of Human Services and Health and the AIHW, and scientific publications. Subjects covered encompass health, health actions, reproductive health, causes of death, life expectancy, violence against women, occupational health, risk factors, screening for breast and cervical cancer, health of selected groups (migrants, Aboriginals, older women and the disabled), medical workforce, and health expenditure and research related to women.

Private hospitals

Findings from the first survey of private health establishments conducted by the ABS are contained in *Private hospitals, Australia* (Catalogue No. 4390.0). National data were obtained in respect of 1991–92 about the facilities, patients, staffing and finances of private acute and psychiatric hospitals and freestanding day hospital facilities. Some findings from the collection are discussed in Section 4.2, page 155.

Infant sleeping positions

Sleeping position has been associated with the risk of Sudden Infant Death Syndrome. In July 1992 the ABS conducted a survey to obtain information on the sleeping positions of children aged less than 2 years. Selected results are published in *Survey of infant sleeping positions, Australia* (Catalogue No. 4386.0).

Survey of Disability, Ageing and Carers

The 1993 Survey of Disability, Ageing and Carers provides national data on people with one or more disabilities and on people aged 60 years or more living in households and health establishments. Information was also collected from household carers. Data is contained in *Disability, ageing and carers: summary of findings* (Catalogue No. 4430.0). Some findings from the survey are presented in Section 1.2.4, page 10.

Department of Human Services and Health

National Nutrition Survey

The National Nutrition Survey (NNS) is a joint project between the Australian Bureau of Statistics and the Commonwealth Department of Human Services and Health.

The need for a survey to provide national information about diet and nutrition has been recognised in many forums in recent years. The conduct of a national nutrition survey was proposed by Commonwealth and State agencies as a national priority under the umbrella of the National Health Information Agreement.

The proposal is to conduct the NNS in association with the National Health Survey in 1994–95. The main aim is to provide high-quality food and nutrition data on a sample sufficient to allow comparison of the results with the 1983 National Dietary Survey of Adults. In addition, the NNS will establish national baselines for children, young adults, the elderly, and people in rural areas.

Monitoring of health indicators

To assist with its reporting on population health indicators, the AIHW has established a steering committee to make recommendations about the specification of health indicators, and to consider data collection priorities and strategies. Specific activities of the Department in this work include preparation of some trial questions about health behaviours in the ABS Population Survey Monitor, and analysis of data about the incidence and prevalence of asthma in Australia and overseas to help in the development of health promotion and other programs.

Regional database

The Department has developed a regional and cross-program database, ORPHEUS, as part of its Regional Focus and Cross-Program Links initiative. This database provides information about target populations for the range of service programs it delivers, and information about the availability and use of services it funds or provides. In tandem with this development, a revised and expanded version of HEALTHWIZ, a health information system for use by primary health care practitioners, has been developed.

Immunisation monitoring system

A survey method to help monitor the need for and use of immunisation programs has been developed by ABS for the Department. This method can be used to gather more information about localised outbreaks of communicable diseases initially identified from administrative data sources.

Health service outcomes

The recent release of the first set of national cost relativities for acute inpatient episodes is a significant early achievement in the development of health service outcome measures. The production of these national cost relativities necessitated the development of national Diagnostic Related Groups computer software, and this software will have extensive use by health service providers.

General practice

The General Practice Evaluation Program is continuing to examine new sources and collections of data to shed light on how general practice operates and its place in the health system. An aim is to describe general practice over time.

Preliminary work has begun on developing common definitions and core data items to improve comparisons of databases relating to the primary care sector. It is evident that data on general practitioner activities and finances are scarce. Data on more sensitive subjects such as expectations of practitioners and of consumers are similarly scarce. It is anticipated that some of these gaps will be filled by the conduct of a Health Industry Survey by ABS in late 1994.

Disability data

The development of a needs-based planning system for disability programs will be completed in 1994. As a major component of this work, ABS has developed a method for estimating the geographic distribution of target populations for the programs, and is now assisting the Department of Human Services and Health in the design of a planning model that estimates demand for services. In addition, the Department has conducted its inaugural census of data about the characteristics of funded services and their clients.

Worksafe Australia

Worksafe Australia has primary responsibility for national occupational health and safety statistics with responsibility for:

- coordination of major statistical developments;
- development, maintenance and support of statistical standards and classifications; and
- dissemination and analysis of national statistics.

It aims to ensure the availability of relevant, timely and comparable national statistics on occupational health and safety; and to facilitate standardised collection and compilation of information, particularly at the workplace.

As part of its responsibility for the national monitoring of work-related injuries and diseases, Worksafe Australia has developed the National Data Set for compensation-based statistics (NDS). The NDS, which was agreed to in 1987, recommends a standard set of data items, concepts and definitions for inclusion in workers' compensation collections. Its main purpose is to enable the production of national and nationally comparable workers' compensation data. The NDS was substantially implemented in 1991–92 in State, Territory and Commonwealth workers' compensation systems. However, as will be noted from Section 1.3.5, page 41, it was not possible to present national statistics in this publication. That must be recorded as a deficiency.

The national injury database, which is maintained by the AIHW National Injury Surveillance Unit, contains injury records supplied by hospital Accident and Emergency Centres. Its capacity to supplement workers' compensation data, by providing occupational injury data for areas such as the rural sector which have poor coverage under the NDS, is being evaluated.

When the NDS allows the production of national compensation-based statistics, these statistics will still not cover all work-related injuries. They exclude:

- injuries causing absence from work of less than five working days;
- injuries to the many workers not covered under general workers' compensation legislation such as those covered under the NSW Transport Authorities Act;
- most injuries to the self-employed; and
- injuries not claimed or unsuccessfully claimed under workers' compensation legislation.

Workers' compensation systems are generally a poor source of data on occupational diseases, particularly those involving a long latency period. As a result, Worksafe Australia is investigating use of other sources of occupational health and safety data, including registrations of births and deaths, cancer registries, coroners' records, and the Australian Bureau of Statistics Population Survey Program.

Worksafe Australia also wishes to assess the feasibility of collecting information on the longest held occupation of adult patients admitted to public hospitals.

Department of Veterans' Affairs

The Health Program of the Department of Veterans' Affairs (DVA) is responsible for meeting the health needs of 340,000 veterans and war widows, a substantial proportion of Australia's elderly population. For example, 25% of males aged over 65 years are entitled to health treatment from DVA. Treatment is not restricted to war-caused injury, and the health services provided are comprehensive; they include medical services, allied health services, pharmaceuticals, community nursing, respite care and hospital treatment.

DVA currently operates a number of hospital facilities: Repatriation General Hospitals, which provide inpatient treatment for acute illness and out-patient services; and Repatriation Auxiliary Hospitals, which provide rehabilitation, convalescent and respite care. The DVA provides morbidity data to State and Commonwealth hospital morbidity collections, and also contributes information to collections such as the Hospital Utilisation and Costs Study. It is represented on the National Health Data Dictionary Committee.

It is the Commonwealth Government's policy that DVA withdraw from the direct provision of hospital services by 1 July 1995. These services will then be provided through the Repatriation Private Patient Scheme. This scheme enables eligible veterans and war widows access to local hospitals as repatriation private patients. The Repatriation Private Patient Scheme is operating in Tasmania, New South Wales and Western Australia. In accordance with Commonwealth and State privacy legislation, DVA has arranged for the provision of casemix information on veteran public hospital episodes from the New South Wales and Tasmania morbidity databases. Negotiations are continuing with other States about the integration of repatriation facilities.

DVA has extensive information on veterans' and war widows' use of health services, derived mainly from administrative systems used for paying accounts and monitoring expenditure; the Department processes approximately 18 million accounts per year. As far as practicable, the Department uses established classification and coding schemes, such as item codes from the Medicare Benefits Schedule. In addition to the administrative systems, there is also a statistical database that contains individual profiles of the use of health services. The database covers a random sample of 15,500 veterans and war widows, and allows patterns of service use to be analysed, as well as inter-relationships between the use of different services.

In 1992 DVA carried out a health survey of a random sample of 2,600 veterans and war widows. The survey included questions on chronic conditions, disabilities, risk factor behaviour, self-assessed health, and attitudes about lifestyle changes. Carers of disabled veterans and war widows were also interviewed about aspects of their role as carers. Approximately 90% of respondents consented to DVA linking their responses with its comprehensive data on individuals' use of medical, hospital and allied health services.

A major identified need is the enhancement of administrative data so that they can be used to assess the outcomes and effectiveness of current services and programs. Areas needing development include: the establishment of appropriate conceptual frameworks and outcome measures; the identification of additional information that is needed, ways of collecting it and ways of integrating it with administrative data; and the development of methodologies for analysing and presenting the information.

5.3 National Death Index

The National Death Index (NDI) is a database housed at the AIHW which will eventually contain records of all deaths occurring in Australia since 1980.

The NDI was developed for use by medical researchers, who frequently need to find out whether the subjects of their studies have died and, if so, when and from what cause. In many research studies, particularly those which are long term or involve large numbers of individuals, researchers experience difficulty in tracing their subjects. Examples of such projects include follow-up of people known to have been exposed to specific health hazards, people suffering from a particular disease, or patients taking part in clinical trials.

Australian death records are kept separately for each State and Territory by the local Registrar of Births, Deaths and Marriages. To search for a group of subjects in eight different registries entails obtaining permission from each registrar and then using a number of different systems which vary greatly in their accessibility and capacity to provide information on specific people.

Searches are made more difficult by changes and errors in personal details, both of which occur frequently. The change in surname when women marry is well recognised, but it is not well known that incorrect details are often supplied when deaths are registered. Given names are often transposed, incorrectly spelt, or partly replaced by nicknames. The date of birth is often wrong; many people know the birthday of an elderly relative, but not the year of birth.

The National Death Index has been equipped to overcome these difficulties. Through a suite of computer programs it is able to link death data to records supplied by researchers. To use the NDI, medical researchers need apply only to the AIHW in order to match their subjects to the death records held in the database. Strict controls are applied, for much of the information is of a personal and confidential nature. All applications for access to it must have been approved by the ethics committee of the host institution and by the AIHW Ethics Committee. No personally identifying information may be published.

The successful development and implementation, in 1994, of the NDI is attributable to the effective cooperation between the Institute, the State and Territory Registrars, and the Australian Bureau of Statistics which codes the causes of death. By late 1992, all States and Territories had agreed to participate in the NDI. During 1993, the Institute put much effort into obtaining data from previous years, establishing procedures for updating information from registries, and choosing a linkage system.

5.4 Health statistics for Aboriginals and Torres Strait Islanders

In this section, 'Aboriginals' and related terms are used to refer to both Australian Aboriginals and Torres Strait Islanders.

Achievements

The need for more comprehensive national Aboriginal health statistics has been recognised for many years. In 1984 a Commonwealth Government Task Force reached agreements with all States and Territories except Queensland (which it did not visit) to identify Aboriginals in the birth and death registration systems, and the hospital morbidity and perinatal data collections (Task Force on Aboriginal Health Statistics 1985).

Since then, provision has been made for some identification of Aboriginals in all these collections except the birth and death registration systems in Queensland. Following a review of information systems for registration, it is likely that Queensland will introduce Aboriginal identification on birth and death certificates.

All cancer registries provide for Aboriginal identification in cancer registrations, although data quality and completeness are variable. Less progress has been made in providing for Aboriginal identification in communicable disease notifications, where Victoria and Tasmania do not yet collect this information.

The Institute has undertaken a small survey of disability and handicaps among Aboriginal people (see Section 1.3.3, page 26).

Recent developments

The 1989–90 National Health Survey was the first major health survey undertaken by ABS to provide for the identification of Aboriginals, but no special sampling procedures were employed to ensure that the number of Aboriginals included in the survey was large enough to provide detailed information on Aboriginal health. Some information on Aboriginals from the Survey has been published (ABS 1993).

To overcome this problem in the National Health Survey to be conducted in 1994 and 1995, ABS will increase the Aboriginal sample in that survey. The increased sample, funded by AIHW, the Aboriginal and Torres Strait Islander Commission, and Commonwealth and State health agencies, will yield national estimates of key Aboriginal health indicators for urban and rural areas, and permit comparison with those for non-Aboriginals.

As part of its response to the Royal Commission into Aboriginal Deaths in Custody, the Commonwealth Government funded ABS to conduct a national Aboriginal survey in the first half of 1994. Information has been collected on the demographic, social, economic and health characteristics through a representative sample of the Aboriginal and Torres Strait Islander population. Findings from this survey will include information on self-reported illness, risk factors, health-related actions taken by individuals, and disability and handicap.

Although draft health goals and targets for Aboriginal health have been developed (Wronski & Smallwood, undated), these targets were not widely accepted by Aboriginal representative groups, and will be revised in conjunction with the national health targets for the four identified priority areas (cardiovascular disease, cancers, injury and mental health—see Section 1.5).

The Institute is developing databases for vital statistics and hospital morbidity collections identified by the Task Force on Aboriginal Health Statistics. As part of this initiative, the Institute convened a workshop on Aboriginal health statistics and research in Brisbane in June 1993.

Gaps and deficiencies

Provision for the identification of Aboriginals in major health statistical collections and surveys and the conduct of a national Aboriginal survey represent important advances. However, providing for identification does not guarantee that Aboriginals are so identified. This incomplete recognition is most significant in the larger urban centres.

To ensure that adequate levels of Aboriginal identification are achieved in the health-related collections, intensive validation studies and concerted action to improve the identification of Aboriginals are needed. There is also a need for Aboriginal identifiers collected by some States only, such as in communicable disease notifications, to be included in all States' major health collections.

The National Perinatal Statistics Unit is developing a national perinatal data collection and, as part of this task, will address the lack of national data on Aboriginal perinatal outcomes.

5.5 Developments in injury surveillance

The main objectives of injury surveillance are to:

- describe injury levels and patterns, to inform communities and provide a basis for policy development;
- set targets for categories of injury and injury risk factors which are to be the subject of control efforts, and monitor progress towards these;
- identify new, unusual, and previously unrecognised forms of injury, refine and update understanding of injury and monitor occurrence of 'sentinel events'; and
- describe and characterise groups of injury cases to generate hypotheses and to provide the basis for research into causes or risk factors and the effectiveness of preventive measures.

Monitoring of trauma management and rehabilitation services may also be regarded as an aspect of injury surveillance.

Table 5.1 summarises the main data sources for each of these aspects of injury surveillance and indicates the levels of detail required.

Currently, information for injury surveillance is derived from ongoing mortality data, hospital inpatient collections, and surveillance systems from some hospital emergency departments. It also comes from special sources, such as a register of spinal cord injuries, police reports of people injured in road crashes, and the National Health Survey.

Enhancements are necessary if the objectives of injury surveillance are to be met. A proposed injury surveillance data standard will help direct attention to the most important information needs, improve data consistency, and facilitate comparisons and linkage. New data sources may be needed for certain aspects of injury surveillance.

National Minimum Data Set—Injury Surveillance

A minimum data set for injury surveillance, the *National minimum data set—injury surveillance* (NMDS[IS]), has recently been developed by NISU, in collaboration with injury surveillance and prevention workers (NISU 1993). The data set is based on extensive experience in surveillance in emergency departments, is compatible with the International Classification of Diseases and the *National health data dictionary—institutional health care* (AIHW 1993), and is designed to enable effective injury surveillance. Endorsement of the NMDS[IS] as a national standard will be sought from the National Health Data Committee.

Data collected according to the NMDS[IS] is of sufficient detail to satisfy the first injury surveillance objective listed above, and will go a long way towards meeting the others. It has been designed to enable national injury targets to be monitored.

Although work to date has focused on the use of the NMDS[IS] in emergency departments of hospitals, the standard is intended to provide a core of data items for use in other settings. Many of the enhancements of existing data sources described below are designed to increase compatibility with the NMDS[IS].

Mortality data

As recommended elsewhere (AIH 1991; AIHW 1992), the classification of causes of death from injury should be expanded to include the nature of injury, place of occurrence, and activity at time of occurrence.

The mortality data collection should also enable access to the narrative descriptions that exist in coroners' records for most fatal injuries. Such access would be achieved efficiently through a national coroners' information system, which coroners support. The practical obstacle is the lack of an adequate electronic data system. Endorsement by the health sector of the need for such a system, which should be consistent with the NMDS[IS], and contribution to its development costs, may lead rapidly to substantial benefits.

Enhancement of mortality information along these lines will bring it into accord with the proposed NMDS[IS].

Inpatient data

Injury surveillance requires improved national compatibility and accessibility of hospital separations data. The potential for greater use of computerised patient management information systems (PMIs) requires exploration, as these offer the prospect of much more timely information than separations data can provide.

Ambulatory patient data

The primary need is for formal endorsement of, and support for, a national data standard, and for incorporation of this standard into PMIs now being introduced into hospital emergency departments. The NMDS[IS] has been developed for this purpose, and has now been taken up in several PMIs.

In the longer term, representative national coverage of injury attendances is desirable. The practicability of this depends on the development and implementation of a national minimum data set for ambulatory health care to include injury surveillance data items.

PMIs offer potential improvements in data collection for injury surveillance. For example, sampling of cases on which to collect data will be possible in many settings.

Rare injury registers

A rare injury register is similar in concept to a disease register. Certain injuries, although relatively rare, are important subjects for injury surveillance. Their importance may derive from severity of outcome (such as spinal cord injury), current research needs (near drowning in early childhood), type of trauma (severe brain injuries, severe burns) or an exposure factor (injuries related to tractor roll-over).

Operation of the register must be tailored to the problem. A review, which is nearing completion, of a previously used method for registration of spinal cord injuries will recommend a modified method.

Integration of information

Several types of analysis of injury surveillance data depend on an ability to link data. For example, estimates of the incidence of injury leading to admission to hospital are distorted by inability to identify readmissions to the same or to another hospital. Information obtained in emergency departments on the circumstances of injury usually cannot be linked easily to information on length or outcome of inpatient stay—information essential for estimating the severity and costs of injuries.

Potential gains from linking data from other sectors with health sector data are also great. For example, police and transport departments collect information on the circumstances of road crashes, but have poor data on resulting injuries. Health sector data have complementary strengths and weaknesses. The Road Injury Information Program at NISU is investigating the potential of linking data (O'Connor 1992).

Progress in this area depends on technical and policy factors. The key technical consideration is data comparability, which can be improved by use of data standards such as the NMDS[IS], and by inclusion of common case identifiers. The policy issue is the balance that Australian society chooses to adopt between considerations such as protection of privacy, which limit the use of information, and the costs that result from more expensive and less powerful injury prevention research.

Table 5.1: *Overview of purposes of injury surveillance and corresponding data requirements*

Functions and purposes	Relevant data sources	Data required—injury categories	Data required—places and persons	Data collection and analysis
Describe injury levels and patterns to inform policy	• Mortality • Hospital separations • Emergency departments • Periodic surveys (e.g. NHS)	NISU minimum data set aggregation of ICD 'external cause' categories	Australia; States and Territories	Administrative by-product data
Identify and monitor specific injury or risk-factor groups which are to be the subject of control efforts (targets)	• Routine mortality • Hospital separations • Emergency departments • Special-purpose surveys • In-depth studies	ICD 'external cause' and injury classifications at detailed level (may need more)	Varies. Targets may be national, State/Territory, regional, local or for a risk group	Administrative by-product data. Also special, targeted research
Identify classes of injuries or risk factors which are not common, yet are severe, or are easily preventable	• Emergency departments • Coroner case registers • 'Near-miss' reports	Well-defined categories of injuries and events, revised periodically	National	Usually based on administrative by-product data. Needs formal assessment and follow-up of cases
Identify specific risk factors for injury	• Routine mortality • Hospital separations • Emergency departments • Trauma registers • Risk-factor surveys • Special studies	Varies. Purpose-specific	Varies. May best be studied at national, State, regional or local level, or in a population group	Often use by-product data. Analysis is topic-specific, may be complex, and will involve a number of research centres
Develop injury prevention measures	• Detailed and specific research projects	Varies. Project-specific	Varies	Usually collected for the project
Monitor injury management and rehabilitation	• Retrieval service • Emergency departments • Trauma service • Rehabilitation service • Hospital separations	Varies. Increasing interest in standards (e.g. National Health Data Dictionary)	Often specific to a treatment service. Some interest in standardisation (e.g. 'regional trauma services')	Primary product or by-product of administrative systems

Trauma service monitoring

Some inter-related needs for information systems have emerged as a result of trauma care services being increasingly organised on a regional or State basis, to encompass several clinical facilities and ambulance services.

- Many hospitals which provide high-level trauma treatment services now have specialised trauma teams to deal with severe injuries. Clinicians involved in the trauma teams need detailed case information for patient management, clinical audit and research purposes, necessitating the establishment of information systems, usually referred to as trauma registers.
- Some hospitals collect information on all injury patients, whether or not managed by a specialist team. Such data systems tend to be distinct from the hospital separations system, and provide more detailed and clinically relevant information. These systems are usually simpler than the trauma registers.
- Regional and State trauma services require information systems to monitor their work loads and evaluate performance. For this purpose, patient information collected is limited to indicators of severity and type of injury, and information on transfers and times of treatment.

In the absence of agreed Australian information standards (National Road Trauma Advisory Council Working Party on Trauma Systems 1993), it is timely to encourage the development of mutually compatible, national data standards preferably within the framework of the National Health Information Agreement, and the National Health Data Dictionary. The standards should also be compatible with the NMDS[IS].

Risk factor and exposure monitoring

Information on risk factors enhances interpretation of information about the occurrence of injury. The frequency or severity of an injury may warrant research, but risk factor information helps determine priorities for research. Research into causes of injury and evaluation of interventions usually requires exposure data. Moreover, where a risk factor has a well-established relationship to an injury, and where the injury is rare or otherwise difficult to measure, monitoring of risk factor exposure may provide more useful information than monitoring of the injury.

This aspect of injury surveillance is increasingly becoming the focus of attention. ABS Surveys of Safety in the Home, recently conducted in New South Wales and Victoria, have provided useful information on domestic accidents (Lazzaro 1993; Farrell 1993). Consideration should be given to extending them nationally, and to repeat surveys to monitor changes in exposure. The NISU Road Injury Information Program has studied needs and opportunities for improved exposure data relevant to road safety (ARC 1993).

Research into causes of injury and prevention strategies

Resolution of questions of cause and effect requires information beyond that which a surveillance system can provide. Two types of injury research question can be distinguished: questions about causation (e.g. What are the relative contributions of several causal factors to a particular type of injury?); and questions about activities to prevent injury (Does a certain intervention work?).

Surveillance data often provide a starting point for causal research, highlighting areas warranting investigation, suggesting hypotheses, and sometimes providing cases on which a study can be based. However, a special collection of information is generally needed.

Topics most urgently in need of research emerge from the processes for setting priorities among injury control targets, and planning work programs to achieve them.

Formal evaluation of measures to prevent injury is widely advocated, but poses an important question: which measures should be evaluated, and in which way? Injury prevention efforts are sometimes expensive, may have important unintended consequences, and may be acceptable only if a certain level of effectiveness can be demonstrated. Formal evaluation of effectiveness tends to be expensive, difficult and time-consuming.

The question, then, is how to decide when an Australian evaluation of effectiveness is warranted. It might be warranted for measures such as vehicle air bags, random breath testing, and swimming pool fences. However, much of the injury burden is made up of large numbers of individually dissimilar types of event.

Sometimes suspected risk factors change in a way that complicates the study. This particularly causes problems in studies of consumer products that have a market life shorter than the time required to demonstrate levels and mechanisms of risk.

The cost of formal evaluation is unlikely to be much less for a rare problem than for a common one (indeed, rarity poses special difficulties), so the cost-benefit of undertaking formal evaluation is likely to be poor for uncommon problems. Development of criteria to assist funding agencies and researchers decide on these matters would be useful.

5.6 Developments in health outcomes measurement

Are resources being used efficiently to improve the health of the Australian population in an equitable manner? Do Australians receive value for money from their expenditure on health? Do consumers know the likely outcome of various treatments for their condition in order to make informed choices about health interventions? The measurement of health outcomes is one approach to answering these questions.

Why measure health outcomes?

The health outcomes, and hence effectiveness, of many widely used health services are not well documented, or may not even be known. Systematic measurement of health outcomes has gained prominence because of this.

Measurement of health outcomes is well developed in the United States, where the Agency for Health Care Policy and Research has established Patient Outcome Research Teams (PORTs). These undertake long-term follow-up on major treatments, document outcomes, and develop guidelines recommending for whom treatments are suitable and how they should be performed.

The PORTs make extensive use of condition-specific measurements, and many use the SF-36 (see Box 5.1) to place the condition-specific changes into a wider framework of health. This also allows the outcomes (favourable or not) of different treatments for one condition to be compared, and for outcomes of treatments for different conditions to be compared.

Box 5.1: Definitions relating to health outcomes

'Health outcomes' lacks an internationally accepted definition, but is being used in North America, the United Kingdom, and Australia to mean changes in health attributable to intended or unintended interventions, whether in health or in other sectors. An AHMAC Health Outcomes Seminar in 1993 accepted a health outcome as a change in the health of an individual, a group of people or a population, which was attributable to an intervention or series of interventions. A favourable health outcome is an improvement in, maintenance of, or slowing of deterioration of health.

'Health outcomes' is also sometimes used to include process outcomes which are measures of how health services are delivered and are thus mainly indicators of quality of health care.

Health interventions are actions intended to improve health, maintain it, or reduce the rate at which it deteriorates. The actions may be of any kind, for example, diagnostic tests, medical or nursing treatments, counselling or social service support, educational measures, a change in administrative or budgetary responsibilities, or regulations relating to safety. They may also include intersectoral actions such as relief of poverty and improvement of housing, as these may affect the total well-being and the health-related quality of life of individuals. These latter actions can also be viewed as welfare interventions.

Health services outcomes are the effects of health services. Most are effects on health as measured by changes in health or perceived health but they also include consumers' satisfaction with and attitudes to health services.

Many instruments and measures are used in health outcomes research. They include disease-specific measures (e.g. the Arthritis Impact Measurement Scale), general health profiles and general health indices. Other measures that have been used include mortality, morbidity and co-morbidity, functional status, single aspects of health (e.g. of pain, mental health, social adjustment and support) and patient satisfaction.

General health profiles cover several dimensions of health such as physical functioning, role limitations, mental health perceptions and pain. The SF-36 (Medical Outcome Survey 36-Item Short Form Questionnaire), the Nottingham Health Profile, and the Functional Limitations Profile are commonly used measures. General health indexes include the Rosser Disability/Distress Scale and the Quality of Well-Being Scale. These rate individual health on a scale of 1 (full health) to 0 (death) with negative values for some extreme states of disability. They are used to calculate QALYs (Quality Adjusted Life Years) saved, enabling cost-benefit analyses and comparisons of treatments to be undertaken.

The UK Clearing House for Information on the Assessment of Health Outcomes became operational in 1992. Its initial aims were to establish a resource centre and focal point for the exchange of health outcomes assessment materials; to review and appraise outcome measures and methods; to stimulate improvements in design and field application where necessary; and to provide an information and advisory service. The

Australian Health Outcomes Clearing House has been established recently at the AIHW to perform a similar role.

This systematic gathering of data informs patients of the outcomes of choices confronting them, informs clinicians of when different procedures may be appropriate, and informs funders of health services of the benefits and costs of different treatments.

Comparisons are not always of the outcomes of alternative treatments. Competition for funding means health promotion programs need to be compared with treatment programs. For example, which would give the greater benefit for the same cost: more seat belt and drink-driving education or more helicopters for emergency transport of people injured in motor vehicle crashes?

Measuring health outcomes

Developing measures of health, and of changes in health, is not easy, but some quantification is necessary. Outcomes of health services are measured in terms of people's capacity to live their lives as they want. They are generally described in terms of dimensions such as limitation of function, and social and psychological well-being, as well as morbidity.

Many studies measure health or perceived health before and after treatment so as to gain some assessment of the outcome of treatment, although a range of other research designs can be used. Evaluating the effectiveness of different treatments for the same condition also calls for measuring and comparing outcomes. Resources used for one purpose cannot be used for another purpose, and services to one person may deny or at least delay services to another, so there are advantages if resources are used where they will have the best effect. Thus, there is a great demand for instruments to measure changes in health.

At the most basic level, health outcomes measurement consists of documenting changes in function in people who have undergone particular treatments. Currently, efforts are generally made to measure post-operative infection rates, immediate mortality rates, and the frequency with which procedures have to be repeated. These process outcomes are widely used in place of definitive health outcomes, which take long periods to measure.

In the past, number of lives saved was sometimes used to justify funding one service instead of another. Then the number of life-years saved became a commonly used measure, but the capacity to keep comatose people alive almost indefinitely has meant that quantity of life is not always a useful measure of outcome. Efforts are now being directed to measuring the quality of life-years saved.

There is a wide range of instruments designed for measurements of health (see Box 5.1). Some measure directly, or are indicative of, the presence of disease. Others focus on function. The ability to walk and to carry on an independent life will be determined by the extent that a joint is mobile and the degree of pain associated with movement. Instruments are available to measure these dimensions.

Formerly there was a tendency to focus on a single disease-specific outcome of treatment. Now there is a desire to place outcomes into a broader context. Many 'multidimensional' measures of health try to measure both objective elements of functioning and individuals' perceptions about their health. (Some of these are described in Table 5.2.) This acknowledges that individuals may function similarly but experience different levels of distress, disability or handicap. Likewise, people reporting similar levels of disability may report different levels of mental and social functioning.

Table 5.2: *Multidimensional measures of health*

Name of instrument	Number of items	Number of dimensions
Medical Outcomes Short Form 36 (SF–36)	36	9
Nottingham Health Profile (Part 1)	38	6
Sickness Impact Profile and Functional Limitation Profile (UK version)	136	12
McMaster Health Index Questionnaire	68	3

Source: Adapted from UK Clearing House 1993

By combining clinical information and information such as that gathered in multidimensional questionnaires such as the SF-36, it is possible to develop a broad understanding of the impact of illness. This is the basis of assessing the health of an individual or population.

A number of attempts have been made to produce single measures of perceived health. The simplest asks global questions such as 'In general, would you say your health is — excellent, very good, good, fair, poor?' as contained within the SF-36. Such questions may provide basic indicators of health service outcomes and predictors of subsequent mortality.

More complex instruments seek to measure 'health-related quality of life' by weighting the results obtained from multidimensional questionnaires to obtain a single numerical value. They define a set of illness states that are used to classify patients, then others (e.g. health professionals, patients) assign values to these states (Table 5.3, page 226). Although such approaches make explicit their methods and the implications of these for decision making, and even for possible rationing of health services, they are the subject of much current debate.

The Australian Health Outcomes Clearing House

AIHW has a long-standing interest in measures of health and in outcomes measures that can demonstrate the effectiveness of interventions (for individuals, for an identified group, or for the population as a whole). As a result, the Australian Health Outcomes Clearing House (AHOCH) was established in January 1994.

The objectives of the AHOCH are to provide a focus for activity at the AIHW and to work with others to:

- develop and refine measures and descriptors of health which may be useful in the measurement or monitoring of health outcomes;
- measure and monitor the health outcomes associated with health interventions;
- examine methodological issues related to the acquisition of valid and reliable information on the outcomes of interventions;
- establish a database of projects being undertaken which seek to measure and monitor health outcomes;

Table 5.3: *Some utilities for health states*

Health state	Utility
Healthy (reference state)	1.00
Life with menopausal symptoms	0.99
Side effects of hypertension treatment	0.95–0.99
Mild angina	0.90
Kidney transplant	0.84
Moderate angina	0.70
Some physical and role limitation with occasional pain	0.67
Hospital dialysis (dialysis patients)	0.57–0.59
Hospital dialysis (general public)	0.56
Severe angina	0.50
Anxious / depressed and lonely much of the time	0.45
Being blind or deaf or dumb	0.39
Hospital confinement	0.33
Mechanical aids to walk and learning disabled	0.31
Dead (reference state)	0.00
Quadriplegic, blind and depressed	< 0.00
Confined to bed with severe pain	< 0.00
Unconscious	< 0.00

Source: Torrance 1987

- promote the exchange of information and views about the measurement and monitoring of health outcomes and related research;
- make data available to collaborative investigators to facilitate research in health outcomes where practical.

Developments in health outcomes and related work are occurring through national and State and Territory initiatives, and within many academic institutions. Health outcomes are included in the new Medicare Agreements. A major consultancy on Mental Health Consumer Outcomes is about to begin and the AIHW will be contributing to this work.

The quarterly *Health outcomes bulletin* features such developments and activities. The first issue (February 1994) described the New South Wales health outcomes programs, research at the National Centre for Epidemiology and Population Health, and work on clinical care guidelines by the NHMRC Standing Committee on Quality of Health Care.

5.7 Deficiencies in statistics on health of Australians

Statistics have many purposes. But they cannot serve these purposes if they are not available at all, and can do so less convincingly if they are incomplete or if there are problems with their quality or validity. If the purpose requires comparison, their usefulness is reduced if they are not directly comparable with other statistics with which they need to be compared.

In the course of preparation of this edition of *Australia's health*, deficiencies of all these kinds were noted. For the subjects discussed there was only one area where it could be said there was no current information: data on the dietary intake of iron and its supply in food are now very old, and not up to date.

There were, however, a number of subjects which could not be included in *Australia's health* at all, for lack of data. Foremost among these is mental health. There are only National Health Survey data on self-reported prevalence of mental ill-health, and a general survey cannot be expected to yield information on specific illnesses. There are no data on incidence of mental disorders, or on the welfare of mentally ill people in the community. Data on use of mental health services are sparse.

Generally, we lack incidence data for most diseases, except for cancer and for notifiable communicable diseases (although these are often incomplete). Survival data are available only for cancer. The impact of disease in terms of impairment, disability and handicap is very poorly documented. Two other subjects where data are lacking are disorders managed in ambulatory patients and environmental exposures relevant to health.

Statistics on some subject areas are incomplete because the collections are made in some States only. For example, only South Australia and the Northern Territory collect population-based data on induced abortions. In South Australia in 1989, there were 4,342 abortions and 19,610 live births; thus 18% of pregnancies resulted in abortions. Almost 50% of teenage pregnancies were terminated (Chan & Taylor 1991). The deficit in abortion statistics is significant. Data on induced abortions are required for all States and Territories to enable mapping of national information on fertility and an evaluation of family planning services.

Another reason for statistics being of limited usefulness because they are incomplete is that the collection is voluntary. Home births have not always been notified to the State and Territory perinatal collections, so Homebirth Australia, a consumer organisation, and the National Perinatal Statistics Unit collected data from homebirth practitioners and published two reports on home births in Australia for the periods 1985–1987 and 1988–1990. Since then, notification of home births to the perinatal collections has improved.

Deficiencies of coverage can be severe. The major problem of identifying Aboriginals and Torres Strait Islanders was mentioned in Section 5.4. Where there is provision for recording race, the data can be of poor quality. Another problem of coverage, mentioned in Section 2.1, page 78, is that notification of notifiable communicable disease is, strictly, compulsory, but the requirement is not enforceable in practice. The highest notification rates for sexually transmitted diseases are 100 times the lowest; much of this apparent variation relates to completeness of notification. There is great scope for improvement in these statistics.

An example of problems of non-comparability of statistics is described in detail in Section 1.5, page 65. Data on one indicator of obesity are available, but a possibly better indicator has been devised. Whenever a better indicator is devised, or a classification is updated, measures should be taken to ensure that the opportunity for comparison of old and current data is not lost. As noted in Section 1.5, page 65, standard instruments, definitions, and classifications should be used whenever possible.

Extensions needed in existing collections

Some existing collections need to be extended to include additional items. Birthing centres are a comparatively new development, and births in them have not been readily identified in perinatal collections. On the recommendation of the National Perinatal Data Advisory Committee, such births are now being increasingly indicated in these collections.

Section 1.3.4, page 36, considered the health of rural Australians, but the only comparisons that could be presented were of metropolitan and non-metropolitan areas. The areas designated as metropolitan range from Sydney to Hobart. Australia has many medium-sized and small country towns. It also has rural areas that are close to major centres, at intermediate distances, and remote. Statistics are needed on the health of residents of each of them; some information could be obtained by more informative classification of addresses in many existing collections.

One strategy which is being used to remedy the lack of information on health of comparatively small populations is taking larger samples of these populations in national surveys. Section 5.4 described how this was planned to be done for Aboriginals in the 1994–95 National Health Survey.

The size of many of Australia's populations of particular interest means that this strategy should be considered on many occasions. In Section 1.3.2, page 25, it was noted that migrants born in Europe had the highest prevalences of disability and handicap and those born in Asia and the Middle East had the lowest. Migrants from Italy and Greece had particularly high prevalences of self-reported severe handicap. Explanation of this finding would be helped by either a special survey or by taking a larger sample of migrants in a national survey.

Monitoring health

The Institute has a responsibility to monitor and report on all important aspects of the health of Australians, including areas of public health significance outside the initial four priority areas for National Health Goals and Targets (cardiovascular disease, cancers, injury and mental health) and areas for which goals will not be set because there are no identified effective intervention strategies. For this reason, AIHW is developing a concise but comprehensive set of indicators, to be published regularly, which will monitor national health trends over time. It is intended to enhance this set by the collection of additional data in population surveys and later to extend the monitoring to State and regional level and perhaps to population subgroups such as Aboriginals and Torres Strait Islanders.

The monitoring role should not be limited to accepted national goals and targets. As noted in Section 1.2.1, the high death rates for the Northern Territory mainly reflect the much higher mortality of Aboriginal people, who constitute 31% of the population there. Reasons death rates for Tasmania should exceed those in the Australian Capital Territory by 25% (males) and 26% (females), and other variations in death rates among States and Territories, have not been studied in detail, but clearly they should be.

It is also desirable to evaluate public health action. An example is monitoring the incidence of anencephalus and spina bifida, serious malformations of the brain and spine that result in death or major disability and handicap. A study in the United

Kingdom has shown that supplements of a vitamin, folic acid, are effective in preventing these neural tube defects in subsequent children of women who have already had an affected child (Medical Research Council Vitamin Study Research Group 1991). Other studies indicate that supplements of folic acid are also likely to prevent many first occurrences of neural tube defects.

The National Health and Medical Research Council has made a series of recommendations on periconceptional folic acid supplementation for women likely to become pregnant and for those with a close family history of neural tube defects (National Health and Medical Research Council 1993). Monitoring the effectiveness of these recommendations in reducing the occurrence of neural tube defects requires notification of any malformations in births and in pregnancies terminated after prenatal diagnosis of neural tube defects.

Another example, described in Section 2.6, page 100, is the demonstration of the effectiveness of legislation requiring helmet wearing by cyclists in the prevention of head injury.

Much of the information in Section 2.6, which presents only a sample of the data available from the NISU Road Injury Information Program, has not been available before and will enable better targeting of safety problems. The Program is developing national data on the incidence and severity of road injury to improve monitoring and prevention of road injury (O'Connor 1992). For example, information on head injury in road crashes in Australia will enable development of goals for a targeted level of reduction in head injury. Information on the apparent severity of pedestrian injury and lower limb injuries may lead to a shift in priorities in treatment of crash victims.

There is also the need for an improved level of analysis of road safety problems and countermeasures in Australia to enable better priority setting. This analysis must include comparative assessment of countermeasure options, based on information on community interests and concerns, as well as data on the manageability of the problem and on cost–benefit ratios.

5.8 Deficiencies in statistics on health care funding, resources and use

Health expenditure

Statistics of health expenditure by State governments are available from a variety of central agency sources, including the ABS public finance database, State health authority annual reports, State Budget papers and the Commonwealth Grants Commission (CGC).

These bodies have adopted different practices for defining and measuring State health expenditure, resulting in discrepancies between sources and a lack of detailed information at the State level. For example, the CGC database, one of the better databases on State health expenditure, includes Commonwealth grants to States, reports recurrent expenditure only and excludes capital expenditure and capital consumption (depreciation). Data presented by the Commission includes standard, standardised and actual expenditure (see Box 3.2).

The Work Program for the National Health Information Agreement has a project to develop a standard set of definitions on agreed expenditure areas and to produce a uniform health expenditure data set.

Costs of health services

With the exception of medical services billed to the Health Insurance Commission, information about care provided outside institutions is poor: little is known about the types of people who use the services, who they attended and why, what services are provided, and what the services cost.

There is also very limited information about the costs of providing all complex health services (such as the cost of a hip replacement) or about the efficiency with which services are delivered. There is even less information about the costs of 'episodes of care', where care is provided by a number of clinicians in different locations (such as treatment that requires care in the community, then hospitalisation, then rehabilitation in the community).

Health labourforce

There are limitations on each of the present national health labourforce data collections.

ABS national census statistics are based on the highest qualification obtained and thus generally do not count as health professionals those whose activity is mainly in a non-clinical area such as research, education or administration, because their highest qualifications are in other fields. ABS quarterly estimates of numbers of people employed in health professions overcome this problem but suffer from significant sampling error.

For doctors, Medicare provider statistics from the Health Insurance Commission provide very important and useful profiles of active practitioners. However, they do not achieve full coverage of the medical labourforce because salaried practitioners and those working in fields where services are not covered by Medicare, such as occupational medicine, are not included.

Another source of data on health professions is by surveys at the time of annual registration. Response rates in such surveys for medicine, nursing, dentistry, pharmacy, podiatry and physiotherapy vary from 70% to 96%. The extent to which this non-response is related to registration of the one individual in several States, or to other factors, is unknown.

To overcome this problem, the Australian Medical Council and the Australian Nursing Council are introducing mutual recognition by 1996. This will greatly improve the quality of national statistics in medicine and nursing. The improvements include elimination of duplication in registration statistics, synchronisation of State and Territory collection periods, and improved recording of information to meet national standards. Statistics relating to other health professions would be improved by introduction of similar arrangements.

Public hospital workforce planning suffers from a lack of statistics in sufficient detail to address distribution, training, and other workforce issues. Periodic surveys to collect sufficiently detailed statistics from public hospitals achieve at best a 70% response.

Hospital morbidity

Information on sickness and disease is available through the hospital morbidity collections maintained by all State and Territory health authorities and the Department of Veterans' Affairs. These collections, based on inpatient episodes, include sociodemographic, diagnostic, and duration of stay data, and information on procedures performed.

The Institute is encouraging greater uniformity of existing collections through the definitional work of the National Health Data Committee. The Institute is currently developing the National Hospital Morbidity data base, which will be based on the National Minimum Data Set for institutional health care. Standardised coding is not yet fully implemented.

Morbidity data are coded from the hospital records of individual patients. These data are primarily patient management instruments incorporating data from the patient's admission form, and data recorded during the stay and on separation (see Table 5.4). Such records have deficiencies for statistical purposes. Among these are the focus on the hospital stay and the lack of a unique national patient identifier. As a patient may enter hospital several times for the same condition, this means that statistics relate only to admissions and not to patients.

Table 5.4: *Australian Institute of Health and Welfare Hospital Morbidity data collection, latest holdings*

State	Year	Coverage	Completeness
New South Wales	1991–92	Public and private	Full NMDS data
Victoria	1991–92	Public	Full NMDS data
Queensland	1990	Public and private	Partial NMDS data
Western Australia	1991–92	Public	Partial NMDS data
South Australia	1991–92	Public and private	Full NMDS data
Tasmania	1991–92	Public and private	Partial NMDS data
Australian Capital Territory	1991–92	Public	Full NMDS data
Northern Territory	1990–91	Public	Full NMDS data
Department of Veterans' Affairs	1991–92	Public	Full NMDS data

The hospital record is a complex document which requires trained coders to abstract and code relevant information. Such people are in relatively short supply. The recently established National Coding Centre will be instrumental in developing standards for coding and for training coders.

Waiting lists

A number of States and Territories have collected and published significant amounts of waiting list information, but there has been no consistency in the definitions used or the manner in which the information has been presented. Consequently, AIHW has been asked to develop a national set of definitions for waiting lists and to routinely publish national data based upon these definitions. Improvement of waiting list data has also been identified as a key activity under the National Health Information Agreement.

AIHW began to develop national definitions in early 1993 in consultation with State and Territory health authorities and in conjunction with the waiting list management reforms being undertaken through the Hospital Access Program of the Department of Human Services and Health. Recommended definitions were proposed to the National Health Data Committee in March 1994.

In March 1994 AIHW published a report summarising the data available in late 1993. This report highlighted differences in scope and quality of the data available at that time. It emphasised a need to change the focus of waiting list statistics from the numbers of people waiting for elective surgery at any time to the numbers of patients failing to receive care in a clinically or socially acceptable time.

Quality of health care

Information about the quality of care provided, whether in institutions or out, is totally lacking. Though the majority of hospitals are accredited with the Australian Council on Healthcare Standards, accreditation is only now starting to move away from being based on the physical structure of hospitals and the processes of care. It is starting to look at the quality of care provided, and at process 'outcomes' rather than the processes themselves. Accreditation for other health services is less developed.

There is almost no information about the health outcomes that result from the $3,500 million spent on health services.

Health technology

There is a lack of data on the level of use of various technologies on outpatients of public hospitals. Data remain sparse on the use of magnetic resonance imaging and other technologies which do not attract reimbursement through Medicare benefits.

Good data on renal transplantation are provided by the annual ANZDATA report (see Table 4.26, page 187). The more limited data in Table 4.25 (page186) are obtained from ACCORD. Numbers for the different forms of transplant are as supplied by the transplant registries and coordinators to ACCORD. There may be small discrepancies with data collected and published elsewhere, for example in reports from AHTAC. Consistent national level data on one-year graft survival are available for kidney transplantation but not for most other forms of transplantation.

5.9 Towards an optimised health information and statistics system

The National Health Information Agreement is a major contribution to the development of national health information. Support for the Agreement has increased as health authorities have become aware of the possibilities that it offers for effective concerted action. Non-government bodies who are not signatories to the Agreement are also showing great interest in it, and many of them are seeking to have their work recognised in the National Health Data Dictionary. The vital role of these bodies is recognised, and the National Health Information Management Group will be reviewing ways of maximising involvement of non-signatories in the processes of the Agreement.

As part of its continuing responsibility for identifying national health statistics priorities, the Institute will, during 1994, develop a National Health Information

Framework to provide a logical structure for the description and classification of health information. The framework will assist in identifying priority areas for work. Then, towards the end of 1994, the Institute will conduct a National Health Information Forum. Following the Forum the Institute will consult with other stakeholders, then publish a National Health Information Plan. In turn, this will influence the developmental work of the Institute and of other signatories to the National Health Information Agreement.

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Statistical tables

Fertility and pregnancy

Table S1: *Estimated resident population by sex and age group, selected years, 1901 to 1991 (number)*

Age group	1901	1921	1941	1961	1981	1986	1991
Males							
Less than 1	47,247	68,140	64,746	116,736	117,842	122,376	132,946
1–4	172,957	237,382	235,996	451,006	465,376	496,644	519,356
5–14	450,067	569,576	572,940	1,058,453	1,321,340	1,277,080	1,290,729
15–24	366,146	455,681	631,286	776,319	1,320,618	1,368,973	1,405,897
25–34	320,455	453,279	594,709	728,618	1,244,663	1,317,452	1,416,512
35–44	279,558	367,484	493,543	739,220	931,360	1,161,863	1,319,366
45–54	156,674	280,969	434,359	628,894	772,879	810,180	960,260
55–64	99,170	207,023	305,575	428,856	661,984	736,433	734,081
65–74	64,716	89,483	172,064	266,069	426,174	475,396	548,636
75–84	18,731	29,188	68,762	102,292	158,247	199,083	243,406
85 and over	2,207	4,665	7,739	15,789	27,784	34,707	44,220
All ages	**1,977,928**	**2,762,870**	**3,581,719**	**5,312,252**	**7,448,267**	**8,000,187**	**8,615,409**
Females							
Less than 1	46,077	65,312	62,008	111,755	112,880	116,208	126,139
1–4	168,836	229,372	226,841	429,996	443,520	473,257	493,262
5–14	441,003	555,222	551,617	1,009,052	1,264,582	1,213,953	1,223,098
15–24	365,792	462,563	613,096	730,052	1,278,293	1,314,958	1,354,941
25–34	293,424	458,492	573,606	665,421	1,212,261	1,300,222	1,408,886
35–44	216,135	351,166	473,819	707,223	891,517	1,119,161	1,303,292
45–54	118,574	255,574	439,892	596,964	737,394	768,943	915,819
55–64	80,302	178,233	305,835	435,378	691,752	738,536	728,737
65–74	48,935	80,705	184,734	332,702	511,502	567,952	633,509
75–84	14,757	30,777	78,425	148,351	256,487	310,384	370,917
85 and over	2,038	5,448	10,714	29,040	74,805	94,589	110,027
All ages	**1,795,873**	**2,672,864**	**3,520,587**	**5,195,934**	**7,474,993**	**8,018,163**	**8,668,627**

Sources: Commonwealth Statistician 1925; Commonwealth Bureau of Census and Statistics 1943, 1970a; ABS Cat. No. 3201.0

Table S2: *Age-specific birth rates*[(a)] *and total fertility rates,*[(b)] *1921 to 1992 (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
Annual rates								
1988	20.3	81.5	136.9	93.3	30.5	4.6	0.2	1,837
1989	20.6	78.4	135.4	96.1	32.6	5.0	0.2	1,842
1990	22.1	79.4	137.9	101.7	34.7	5.5	0.2	1,907
1991	22.1	75.0	132.0	100.2	36.0	5.5	0.2	1,855
1992	21.9	74.9	132.6	104.6	38.4	6.1	0.3	1,895

(a) Age-specific birth rates are the live births registered during the calendar year, according to age of mother, per 1,000 of the female resident population of the same age as estimated for 30 June.

(b) Total fertility rate is obtained by summing the 5-year age-specific birth rates and multiplying by 5. It represents the number of children 1,000 women would bear during their lifetimes if they experienced the rates of the year shown.

Source: ABS 1977, Cat. No. 3301.0

Table S3: *Age-specific birth rates*[(a)] *and total fertility rates,*[(b)] *States and Territories, 1992 (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	
New South Wales	22.8	79.6	136.4	107.8	41.5	6.7	0.3	1,975
Victoria	14.7	61.8	130.3	109.6	41.2	6.5	0.4	1,822
Queensland	26.5	84.9	134.2	100.1	34.6	5.3	0.3	1,930
Western Australia	25.0	77.3	132.7	100.8	33.7	5.8	0.3	1,878
South Australia	18.7	66.7	120.3	94.9	34.2	5.4	0.4	1,703
Tasmania	29.0	92.3	141.4	92.8	30.1	4.4	0.3	1,951
ACT	14.0	54.3	127.3	107.2	36.3	5.8	0.3	1,725
Northern Territory	90.5	122.7	121.5	95.2	41.5	7.5	–	2,394
Australia	**21.9**	**74.9**	**132.6**	**104.6**	**38.4**	**6.1**	**0.3**	**1,895**

(a) Age-specific birth rates are the live births registered during the calendar year, according to age of mother, per 1,000 of the female resident population of the same age as estimated for 30 June.

(b) Total fertility rate is obtained by summing the 5-year age-specific birth rates and multiplying by 5. It represents the number of children 1,000 women would bear during their lifetimes if they experienced the rates of the year shown.

Source: ABS 1993a, 1993c

Table S4: *Crude birth rates*[a] *and total fertility rates,*[b] *selected countries, latest available year*

	Crude birth rate		Total fertility rate	
Country	Year	Rate	Year	Rate
Australia	**1990–95**	**15.1**	**1992**	**1,895**
Canada	1990–95	14.2	1989	1,768
Chile	1990–95	22.5	1990	2,660
France	1990–95	73.7	1990	1,780
Germany	1990–95	11.4	na	na
Greece	1990–95	10.4	1984	1,821
Hong Kong	1990–95	12.7	1989	1,229
Iceland	1990–95	17.4	1990	2,310
India	1990–95	29.2	1988	4,000
Indonesia	1990–95	26.6	1989	3,380
Ireland	1990–95	14.4	1990	2,194
Israel	1990–95	21.1	1990	3,016
Italy	1990–95	10.0	1990	1,310
Japan	1990–95	11.2	1989	1,572
Lebanon	1990–95	27.1	1985–90	3,790
Malaysia	1990–95	28.6	1985–90	4,000
Malta	1990–95	15.2	1989	2,109
Netherlands	1990–95	13.7	1990	1,617
New Zealand	1990–95	17.4	1990	2,155
Norway	1990–95	14.8	1990	1,932
Philippines	1990–95	30.3	1985–90	4,330
Poland	1990–95	14.3	1990	2,039
Russian Federation	1990–95	16.0	1989	2,016
Singapore	1990–95	15.9	1988	1,975
South Africa	1990–95	31.3	1985–90	4,480
Spain	1990–95	10.8	1988	1,427
Sweden	1990–95	14.0	1990	2,137
Switzerland	1990–95	12.7	1990	1,590
United Kingdom	1990–95	13.9	1990	1,840
USA	1990–95	15.9	1989	2,019
Vietnam	1990–95	29.2	1985–90	4,100
Yugoslavia	1990–95	14.1	1989	1,881

na Not available.

(a) Live births per 1,000 mid-year population.

(b) Total fertility rate is obtained by summing the 5-year age-specific birth rates and multiplying by 5. It represents the number of children 1,000 women would bear during their lifetimes if they experienced the rates of the year shown.

Sources: United Nations 1992; World Health Organization 1993

Table S5: *Birthweight distribution of total births,*[(a)] *States and Territories, 1991*

Births / Birthweight	NSW	Vic	Qld[(b)]	WA	SA	Tas	ACT	NT	Australia
					(Number)				
Births									
Less than 2,500 g	5,191	3,844	2,948	1,551	1,253	438	220	349	15,794
All births	**86,738**	**65,007**	**44,701**	**24,935**	**19,715**	**6,951**	**4,520**	**3,483**	**256,050**
					(Per cent)				
Birthweight (g)									
500 to 999	0.5	0.5	0.6	0.4	0.5	0.5	0.4	1.1	0.5
1,000 to 1,499	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.8	0.6
1,500 to 1,999	1.2	1.2	1.3	1.2	1.4	1.4	0.8	2.0	1.2
2,000 to 2,499	3.7	3.7	4.0	3.9	3.7	3.8	3.0	6.2	3.8
500 to 2,499	**6.0**	**5.9**	**6.6**	**6.2**	**6.4**	**6.3**	**4.9**	**10.0**	**6.2**
2,500 to 2,999	15.8	15.4	15.4	15.9	15.7	16.1	15.6	21.6	15.7
3,000 to 3,499	36.9	37.0	36.4	36.8	36.8	35.3	39.5	37.6	36.9
3,500 to 3,999	30.1	30.4	30.4	30.6	30.1	30.5	29.3	23.2	30.2
4,000 to 4,499	9.5	9.6	9.4	9.0	9.3	10.3	9.3	6.6	9.4
4,500 and over	1.6	1.6	1.7	1.5	1.7	1.5	1.4	1.0	1.6

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

(b) Provisional data. Totals include births with unstated birthweights.

Source: AIHW National Perinatal Statistics Unit, derived from data provided by State and Territory health authorities

Table S6: *Infant mortality rates, States and Territories, selected years, 1901 to 1992 (per 1,000 live births)*

Year	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
1901	103.7	102.9	101.9	128.9	100.0	89.0	(a)	62.5	103.6
1921	62.6	72.6	54.2	78.3	65.5	78.0	74.0	63.3	65.7
1941	43.8	36.2	39.1	35.3	32.5	49.0	16.4	83.3	39.7
1961	20.8	17.8	20.0	19.7	20.0	16.8	15.6	23.9	19.5
1981	10.3	9.3	10.4	8.9	8.0	12.3	8.9	23.5	10.0
1988	9.2	7.8	8.4	8.5	7.9	9.6	8.1	(b)19.2	8.7
1989	8.7	6.5	8.5	7.8	7.4	10.6	6.5	14.5	8.0
1990	8.1	7.8	7.7	8.6	8.5	8.9	9.4	15.2	8.2
1991	7.2	6.5	7.6	7.2	5.5	9.0	7.6	14.2	7.1
1992	7.4	5.6	7.9	7.0	6.1	6.6	6.3	15.5	7.0

(a) Part of New South Wales prior to 1911.

(b) Northern Territory rate for 1988 was affected by changed registration requirements.

Sources: Commonwealth Bureau of Census and Statistics 1963; ABS Cat. No. 3302.0.

Table S7: *Perinatal mortality rates,*[(a)] *States and Territories, 1981 to 1992*[(b)] *(per 1,000 live births plus foetal deaths)*

Year	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
1981	13.8	13.3	13.0	12.4	10.6	13.2	10.1	27.9	13.2
1982	13.5	14.5	12.5	11.6	12.8	11.0	11.1	27.1	13.4
1983	12.1	12.5	12.1	10.8	11.3	12.9	11.5	21.1	12.2
1984	12.4	11.7	11.4	12.0	10.3	12.5	9.2	19.5	11.9
1985	11.2	12.2	12.0	10.8	12.4	13.8	10.9	17.4	11.8
1986	11.5	11.7	10.9	11.0	10.1	15.7	10.7	19.7	11.5
1987	10.8	10.2	11.0	10.6	8.8	9.4	10.9	19.0	10.6
1988	11.1	10.1	10.6	9.0	10.0	13.0	11.0	19.9	10.7
1989	10.3	9.3	9.7	8.8	10.1	11.0	9.6	21.1	9.9
1990	10.5	10.5	9.3	9.3	10.2	10.0	12.0	17.0	10.3
1991	10.0	8.8	10.3	8.8	8.0	11.9	10.5	16.8	9.6
1992	10.6	8.2	9.3	8.7	8.1	9.1	9.0	17.0	9.4

(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.

(b) Comparable perinatal mortality data not available before 1973.

Source: ABS Cat. No. 3304.0

Table S8: *Perinatal mortality rates,*[(a)] *by age group of mother, 1981 to 1992*[(b)] *(per 1,000 live births plus foetal deaths)*

	Age group of mother (years)						
Year	Under 20	20–24	25–29	30–34	35–39	40 and over	Total
1981	18.1	12.5	11.7	12.7	17.9	27.8	13.2
1982	18.4	12.8	11.4	12.8	17.8	22.6	13.4
1983	15.4	11.8	10.9	11.6	13.7	25.5	12.2
1984	15.1	11.7	10.1	11.4	15.8	28.1	11.9
1985	14.6	11.8	10.2	11.5	14.4	11.8	11.8
1986	14.3	11.3	9.9	10.5	14.8	23.9	11.5
1987	14.0	10.4	9.1	10.4	12.1	17.6	10.6
1988	14.5	11.0	9.2	9.6	12.9	17.8	10.7
1989	13.2	10.2	8.5	9.6	11.0	16.6	9.9
1990	14.0	10.4	9.2	9.7	11.6	17.0	10.3
1991	14.0	10.0	8.1	9.3	9.8	18.9	9.6
1992	12.9	9.7	8.2	8.7	10.0	15.4	9.4

(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.

(b) Comparable perinatal mortality data not available before 1973.

Source: ABS Cat. No. 3304.0

Table S9: *Neonatal, postneonatal and infant mortality rates,*[(a)] *by sex, selected countries, latest year (per 1,000 live births)*

	Males			Females		
Country	**Neonatal**	**Post-neonatal**	**Infant**	**Neonatal**	**Post-neonatal**	**Infant**
Australia (1992)	**5.1**	**2.8**	**7.9**	**3.9**	**2.1**	**6.0**
Canada (1990)	5.1	2.5	7.5	4.1	2.0	6.1
Chile (1989)	10.0	8.7	18.7	8.2	7.2	15.4
France (1990)	4.0	4.4	8.4	3.1	3.1	6.2
Germany (1990)	4.3	3.7	8.0	3.2	2.9	6.1
Greece (1990)	7.0	2.9	9.9	6.0	3.5	9.6
Hong Kong (1987)	5.0	3.0	7.9	4.7	2.4	7.0
Iceland (1991)	5.5	3.0	5.5	3.2	2.3	5.5
Ireland (1990)	5.3	3.8	9.0	4.3	2.9	7.3
Israel (1989)	6.8	3.7	10.5	6.3	3.3	9.6
Italy (1989)	7.2	2.0	9.3	6.1	1.8	7.9
Japan (1991)	2.5	2.1	4.6	2.3	1.9	4.2
Malta (1991)	10.4	2.2	12.6	3.5	3.1	6.5
Netherlands (1990)	5.4	2.6	8.0	4.2	1.9	6.1
New Zealand (1989)	4.8	7.2	11.9	4.3	4.3	8.7
Norway (1990)	5.1	3.2	8.2	2.7	3.0	5.7
Poland (1991)	12.2	4.6	16.8	9.2	3.8	13.0
Russian Federation (1990)	na	na	24.8	na	na	19.0
Singapore (1990)	5.1	2.0	7.1	4.1	2.0	6.2
Spain (1989)	5.6	3.0	8.6	4.6	2.3	7.0
Sweden (1989)	4.3	2.3	6.6	3.0	2.0	4.9
Switzerland (1991)	4.2	2.9	7.1	3.0	2.3	5.3
United Kingdom (1991)	4.9	3.4	8.3	3.8	2.5	6.3
USA (1989)	6.8	4.0	10.8	5.6	3.1	8.8
Yugoslavia (1990)	12.6	8.0	20.5	10.1	7.9	17.9

na Not available.

(a) Neonatal: Less than 28 days.
Postneonatal: 28 to 364 days.
Infant: Less than 1 year.

Sources: World Health Organization 1993; United Nations 1992; ABS 1993b

Table S10: *Maternal deaths and death rates,*(a) *by triennium, 1964–66 to 1988–90*

Triennium	Total confinements	Direct deaths(b)	241	241	Total deaths(e)	Maternal death rates Direct	 Total
	(Number)	*(Number)*	*(Number)*	*(Number)*	*(Number)*	*(Per 100,000 confinements)*	
1964–1966	667,649	202	–	–	275	30.3	41.2
1967–1969	713,064	166	–	–	237	23.3	33.2
1970–1972	790,818	150	–	–	244	19.0	30.8
1973–1975	726,690	(f)60	32	45	137	8.3	18.9
1976–1978	678,098	52	35	19	106	7.7	15.6
1979–1981	682,880	54	34	9	(g)98	7.9	14.4
1982–1984	713,985	42	25	27	94	5.9	13.2
1985–1987	726,642	32	30	24	86	4.4	11.8
1988–1990	754,468	37	33	26	96	4.9	12.7

(a) Maternal mortality as defined by the World Health Organization is the death of a woman during pregnancy, childbirth or in the 42 days of the puerperium, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management. This definition includes deaths from abortion and ectopic pregnancy, but excludes deaths from incidental causes. In this table, incidental deaths are included as are deaths occurring more than 42 days after termination of the pregnancy, when they have their origin and illness related to the pregnancy.

(b) Direct maternal deaths are those resulting from obstetric complications of the pregnant state (pregnancy, labour and the puerperium), from interventions omissions, incorrect treatment, or from a chain of events resulting from any of the above—they are complications of the pregnancy itself, e.g. eclampsia, rupture of the uterus, postpartum hemorrhage.

(c) Indirect obstetric deaths are those resulting from pre-existing disease or disease that developed during pregnancy and was not due to direct obstetric causes, but which may have been aggravated by the physiological effects of pregnancy, e.g. heart disease, diabetes, renal disease.

(d) Incidental deaths are due to causes such as road accidents, malignancies and suicide where the pregnancy is unlikely to have contributed significantly to the death.

(e) Prior to 1973–1975, no distinction was made between indirect and incidental deaths.

(f) Only 60 of the 69 certified causes of death were judged by the State maternal mortality committees as being direct maternal deaths.

Source: NHMRC 1970, 1972, 1976, 1979, 1981, 1987, 1988, 1991,1993

Table S11: *Maternal death rates,*(a) *selected countries, 1981 to 1990 (per 1,000 live births)*

Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Australia(b)	***10.6**	***10.4**	***6.2**	***7.7**	***4.4**	***5.8**	***5.3**	***4.9**	**na**	**na**
Canada	*6.2	*1.9	*5.4	*3.2	*4.0	*3.0	*4.1	*4.8	*4.1	na
Chile	43.8	51.8	40.3	34.7	50.0	47.3	48.3	na	na	na
France	15.5	13.8	15.1	14.2	12.0	10.9	9.6	9.3	8.5	na
Germany	20.0	17.7	11.4	10.8	10.7	8.0	8.7	8.9	5.3	7.3
Greece	*11.4	*11.7	*14.3	*8.7	*6.9	*8.0	*4.7	*5.6	*4.0	na
Hong Kong	*8.1	*1.2	*7.2	*6.5	*5.3	*2.8	*4.3	*4.0	*5.7	na
Iceland	na	na	na	na	na	na	*23.8	na	na	*21.0
Ireland(b)	*4.2	*5.6	*11.9	*6.2	*6.4	*4.9	*3.4	*1.8	*3.8	na
Israel	na	*3.1	*2.0	*5.1	*8.0	*6.0	*3.0	*5.0	*6.9	na
Italy	13.2	9.6	9.2	9.2	8.1	5.6	*4.5	7.7	na	na
Japan	19.2	18.4	15.5	15.3	15.8	13.5	12.0	9.6	10.8	8.6
Malta	*18.3	*32.9	na	na	*35.8	na	na	na	na	na
Netherlands	*7.8	*6.4	*5.3	*9.7	*4.5	*8.1	*7.5	*9.6	*5.3	na
New Zealand(b)	*5.9	*12.0	*19.8	*5.8	*13.5	*18.9	*12.7	*17.4	na	na
Norway	*2.0	na	*4.0	*2.0	*2.0	*13.8	*5.6	*3.5	*8.4	na
Philippines(b)	105.5	na	na	na	na	na	na	na	na	na
Poland	14.6	14.2	16.2	14.2	11.1	13.1	15.5	11.6	10.7	12.8
Singapore(b)	*4.7	*11.7	*14.8	*12.0	*4.7	*13.0	*6.9	*7.6	*2.1	na
Spain	na	10.5	7.6	*5.2	*4.4	*5.5	*5.0	na	na	na
Sweden	*4.3	*4.3	na	*2.1	*5.1	*2.9	*4.8	*8.9	*5.2	na
Switzerland	*6.8	*12.0	*5.4	*1.3	*5.4	*3.9	*6.5	*10.0	*3.7	*6.0
United Kingdom:										
England & Wales	9.0	6.7	8.6	8.2	7.0	6.8	6.7	5.9	8.1	8.1
Northern Ireland(b)	*3.7	*7.4	*14.7	*10.8	na	na	*3.6	*3.6	na	na
Scotland(b)	*18.8	*9.1	*12.3	*12.3	*13.5	*10.6	*3.0	*12.1	*6.3	*6.1
USA	8.5	7.9	8.0	7.8	7.8	7.2	6.6	8.4	na	na
Yugoslavia	26.6	22.4	16.8	17.2	16.4	14.7	10.6	16.3	15.5	na

na Not available

* Rate based on 30 or fewer maternal deaths.

(a) Data in this table are not directly comparable with those in Table S10. The number of maternal deaths reported in Table S10 have been adjusted after examination by State and Territory maternal mortality committees.

(b) Data tabulated by date of registration rather than occurrence.

Source: United Nations 1992

Mortality

Table S12: *Life expectancy at selected ages by sex, States and Territories, 1992 (years)*

	At birth		At age 15		At age 65	
State / Territory	**Males**	**Females**	**Males**	**Females**	**Males**	**Females**
New South Wales	74.1	80.2	59.9	65.9	15.2	19.1
Victoria	74.8	80.7	60.6	66.3	15.4	19.2
Queensland	74.4	80.2	60.4	66.0	15.5	19.3
Western Australia	75.2	80.9	61.1	66.6	15.8	19.7
South Australia	75.1	80.9	60.8	66.6	15.7	19.7
Tasmania	74.0	79.2	59.8	64.9	15.1	18.3
Australian Capital Territory	76.6	81.3	62.4	67.0	16.3	19.5
Northern Territory	68.3	72.5	54.6	59.1	13.4	14.8
Australia	**74.5**	**80.4**	**60.3**	**66.1**	**15.4**	**19.2**

Sources: ABS 1993b, and unpublished data

Table S13: *Life expectancy at selected ages by sex, 1901 to 1992 (years)*

	At birth		At age 15		At age 65	
Year	**Males**	**Females**	**Males**	**Females**	**Males**	**Females**
Annual averages						
1901–1910	55.2	58.8	49.0	51.9	11.3	12.9
1920–1922	59.2	63.3	51.4	54.6	12.0	13.6
1946–1948	66.1	70.6	54.3	58.3	12.3	14.4
1960–1962	67.9	74.2	55.1	61.0	12.5	15.7
1980–1982	71.2	78.3	57.4	64.3	13.8	18.0
Annual rates						
1988	73.1	79.5	59.1	65.3	14.8	18.7
1989	73.3	79.6	59.3	65.4	14.7	18.7
1990	73.9	80.0	59.8	65.8	15.2	19.0
1991	74.4	80.3	60.2	66.0	15.4	19.1
1992	74.5	80.4	60.3	66.1	15.4	19.2

Sources: Commonwealth Bureau of Census and Statistics 1970b; Office of the Australian Government Actuary 1985; ABS Cat. No. 3302.0

Table S14: *Life expectancy at selected ages, selected countries, latest year (years)*

	At birth		At age 15		At age 65	
Country / Year	**Males**	**Females**	**Males**	**Females**	**Males**	**Females**
Australia (1992)	**74.5**	**80.4**	**60.3**	**66.1**	**15.4**	**19.2**
Canada (1990)	74.0	80.8	59.9	66.5	15.5	19.9
Chile (1989)	69.4	76.5	56.2	63.1	14.0	17.6
France (1990)	73.4	81.8	59.3	67.5	16.1	20.7
Germany (1990)	72.0	78.6	57.9	64.3	14.1	17.8
Greece (1990)	74.6	79.8	60.7	65.7	15.8	18.3
Iceland (1991)	74.9	80.4	60.5	67.0	15.6	20.0
Ireland (1990)	72.0	77.7	57.9	63.4	13.2	17.0
Israel (1989)	74.6	78.1	60.7	64.1	15.6	17.3
Italy (1989)	73.6	80.4	59.6	66.2	15.0	19.0
Japan (1991)	76.4	82.8	62.0	68.4	16.6	21.0
Malta (1991)	73.6	77.1	59.6	63.8	14.1	16.5
Netherlands (1990)	73.9	80.3	59.7	66.0	14.4	19.2
New Zealand (1989)	71.9	78.1	58.2	64.0	14.3	18.1
Norway (1990)	73.4	79.9	59.3	65.6	14.6	18.7
Poland (1991)	66.1	75.4	52.6	61.6	12.3	16.0
Russian Federation (1990)	64.2	73.9	51.7	61.1	12.4	16.0
Singapore (1990)	72.3	77.5	58.2	63.2	14.4	17.2
Spain (1989)	73.4	80.5	59.4	66.3	15.5	19.2
Sweden (1989)	74.8	80.8	60.5	66.4	15.5	19.4
Switzerland (1991)	74.2	81.4	60.0	67.1	15.6	20.1
United Kingdom (1991)	73.3	78.8	59.1	64.5	14.3	18.0
USA (1989)	71.9	78.9	58.1	64.9	15.3	19.2
Yugoslavia (1990)	69.5	75.7	56.4	62.4	13.6	16.3

Sources: World Health Organization 1992, 1993; ABS 1993b

Table S15: *Age-specific death rates, all causes by sex, selected years, 1921 to 1992 (per 1,000 population)*

Sex / Age group (years)	1921	1941	1961	1981	1986	1992
Males						
0–4	2,213	1,289	564	281	244	197
5–9	200	139	49	34	25	20
10–14	172	108	52	29	29	20
15–19	219	159	123	124	106	81
20–24	321	205	161	153	153	119
25–29	373	199	146	133	131	128
30–34	442	232	169	123	132	135
35–39	584	339	229	165	143	147
40–44	730	461	380	261	227	200
45–49	994	737	588	455	351	298
50–54	1,299	1,161	992	790	626	507
55–59	1,895	1,775	1,614	1,294	1,070	866
60–64	2,878	2,774	2,619	1,983	1,794	1,523
65–69	4,199	4,251	4,117	3,231	2,832	2,503
70–74	6,199	6,479	6,252	5,195	4,537	3,976
75–79	10,076	10,054	9,312	8,018	7,206	6,640
80–84	15,368	15,264	14,084	12,112	11,055	10,441
85 and over	26,213	29,453	23,772	20,814	18,722	18,046
Crude rate	**1,106**	**1,099**	**946**	**815**	**778**	**759**
ASR[(a)]	**1,689**	**1,532**	**1,317**	**1,075**	**953**	**855**
Females						
0–4	1,771	1,022	443	216	189	152
5–9	192	103	38	18	18	16
10–14	128	73	30	20	16	13
15–19	205	104	47	45	41	33
20–24	290	155	61	48	54	43
25–29	377	202	74	51	49	43
30–34	426	234	92	57	57	56
35–39	535	311	146	87	76	73
40–44	563	374	209	143	135	113
45–49	690	565	347	265	217	182
50–54	943	780	542	378	353	311
55–59	1,289	1,103	785	617	573	494
60–64	1,915	1,805	1,298	971	883	778
65–69	3,112	2,884	2,178	1,568	1,508	1,267
70–74	5,041	4,789	3,652	2,552	2,479	2,169
75–79	8,295	8,275	6,271	4,426	4,107	3,797
80–84	13,136	12,704	10,241	7,597	7,113	6,728
85 and over	22,345	25,457	20,670	16,035	14,825	14,893
Crude rate	**873**	**901**	**745**	**646**	**658**	**656**
ASR[(a)]	**1,356**	**1,187**	**845**	**611**	**570**	**520**

(a) Age-standardised rates. Reference population is the 30 June 1988 Australian population.

Sources: d'Espaignet et al. 1991; AIHW unpublished data

Table S16: *Age-specific death rates, all causes by State or Territory of usual residence, 1992 (per 1,000 population)*

Sex / Age group (years)	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Males									
0–4	217	166	220	193	157	156	163	388	197
5–9	16	22	22	21	15	11	43	12	20
10–14	18	23	24	16	14	22	9	14	20
15–19	83	67	89	94	76	94	30	160	81
20–24	118	102	128	128	118	193	101	196	119
25–29	129	124	111	131	133	154	120	345	128
30–34	159	117	136	122	100	153	86	241	135
35–39	156	140	142	130	148	124	150	302	147
40–44	220	203	197	138	180	167	121	502	200
45–49	306	299	287	260	304	309	295	493	298
50–54	512	495	515	480	487	511	430	1,123	507
55–59	922	837	908	739	833	793	411	1,452	866
60–64	1,615	1,469	1,556	1,303	1,447	1,628	928	2,659	1,523
65–69	2,569	2,448	2,545	2,324	2,417	2,534	2,283	4,930	2,503
70–74	4,147	3,944	3,957	3,816	3,784	3,698	2,868	4,000	3,976
75–79	6,792	6,634	6,540	6,140	6,454	7,545	5,952	7,764	6,640
80–84	10,744	10,448	9,740	10,094	10,219	11,995	11,628	15,152	10,441
85 and over	18,624	18,476	17,406	16,917	16,954	19,179	14,749	16,327	18,046
Crude rate	**808**	**763**	**736**	**643**	**804**	**832**	**392**	**545**	**759**
ASR[(a)]	**887**	**845**	**845**	**796**	**817**	**901**	**720**	**1,217**	**855**
Females									
0–4	159	119	177	159	123	144	118	458	152
5–9	15	10	19	14	20	11	46	39	16
10–14	9	15	17	12	19	29	–	15	13
15–19	28	32	43	41	39	17	15	48	33
20–24	40	38	44	53	40	79	56	60	43
25–29	37	30	65	56	50	29	24	47	43
30–34	59	46	52	66	66	56	16	146	56
35–39	78	66	81	74	62	72	40	141	73
40–44	105	119	117	117	108	124	72	196	113
45–49	184	183	188	162	181	156	133	358	182
50–54	350	267	291	269	322	417	134	899	311
55–59	499	472	509	478	469	539	515	1,299	494
60–64	814	715	812	716	734	898	851	1,600	778
65–69	1,294	1,250	1,241	1,211	1,172	1,499	1,329	3,437	1,267
70–74	2,199	2,119	2,248	2,084	2,016	2,274	2,281	5,197	2,169
75–79	3,942	3,880	3,646	3,418	3,460	4,389	2,987	5,744	3,797
80–84	6,703	6,954	6,672	6,006	6,395	8,637	6,005	8,673	6,728
85 and over	15,214	15,068	14,472	14,384	14,114	16,068	13,642	16,667	14,893
Crude rate	**696**	**675**	**617**	**552**	**697**	**759**	**338**	**377**	**656**
ASR[(a)]	**245**	**513**	**521**	**492**	**491**	**590**	**470**	**924**	**520**

(a) Age-standardised rates. Reference population is the 30 June 1988 Australian population.

Source: AIHW unpublished data

Table S17: *Age-specific death rates, all causes, by sex, selected countries, latest year (per 100,000 population)*

	Age group (years)					
Country / Year	[a]0	1–4	5–14	15–24	25–34	35–44
Males						
Australia (1992)	**791**	**42**	**20**	**100**	**132**	**173**
Canada (1990)	752	43	26	109	134	200
Chile (1989)	1,865	97	40	131	201	352
France (1990)	839	45	21	115	174	284
Germany (1990)	799	47	24	98	129	240
Greece (1990)	986	35	26	105	105	184
Hong Kong (1989)	746	33	17	46	80	163
Iceland (1991)	553	44	5	155	96	128
Ireland (1990)	904	48	20	82	107	173
Israel (1989)	1,050	53	21	73	93	144
Italy (1989)	928	32	21	93	124	170
Japan (1991)	464	46	19	67	77	157
Malta (1991)	1,257	9	7	84	75	111
Netherlands (1990)	800	43	23	61	85	157
New Zealand (1989)	1,194	66	34	179	151	199
Norway (1990)	825	46	26	87	117	199
Poland (1991)	1,684	59	33	135	234	515
Russian Federation (1990)	2,476	195	64	178	334	591
Singapore (1990)	713	46	26	87	120	203
Spain (1989)	855	52	27	127	174	235
Sweden (1989)	655	30	16	77	112	190
Switzerland (1991)	711	37	28	134	173	205
United Kingdom (1991)	831	40	22	83	95	179
USA (1989)	1,081	54	30	147	201	307
Yugoslavia (1990)	2,052	70	34	90	143	293

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Table S17: *Age-specific death rates, all causes, by sex, selected countries, latest year (per 100,000 population)* (continued)

	Age group (years)					
Country / Year	**45–54**	**55–64**	**65–74**	**75 and over**	**Crude rate**	**ASR[(b)]**
Males						
Australia (1992)	**391**	**1,190**	**3,128**	**9,592**	**759**	**897**
Canada (1990)	463	1,314	3,229	9,594	794	930
Chile (1989)	776	1,860	4,059	11,204	656	1,204
France (1990)	614	1,429	2,822	9,619	987	945
Germany (1990)	625	1,577	3,681	11,903	1,111	1,119
Greece (1990)	430	1,164	2,994	9,746	995	896
Hong Kong (1989)	517	1,321	3,242	7,612	547	na
Iceland (1991)	402	1,147	3,120	10,625	777	893
Ireland (1990)	464	1,634	4,294	12,834	962	1,189
Israel (1989)	430	1,253	3,083	9,647	669	907
Italy (1989)	475	1,397	3,308	10,032	993	977
Japan (1991)	406	1,067	2,464	9,016	745	801
Malta (1991)	359	1,378	3,636	12,071	825	1,041
Netherlands (1990)	423	1,295	3,653	11,282	902	1,001
New Zealand (1989)	509	1,430	3,810	10,812	867	1,068
Norway (1990)	441	1,359	3,578	11,146	1,139	1,010
Poland (1991)	1,248	2,635	5,084	13,478	1,169	1,566
Russian Federation (1990)	1,348	2,706	5,104	12,477	1,074	1,604
Singapore (1990)	596	1,700	3,880	9,063	564	1,097
Spain (1989)	530	1,284	3,079	9,901	903	954
Sweden (1989)	406	1,166	3,100	10,115	1,141	906
Switzerland (1991)	426	1,141	3,038	10,088	966	914
United Kingdom (1991)	471	1,419	3,871	10,971	1,118	1,025
USA (1989)	618	1,565	3,439	9,743	921	1,027
Yugoslavia (1990)	800	1,969	4,073	11,659	958	1,236

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Table S17: *Age-specific death rates, all causes, by sex, selected countries, latest year (per 100,000 population)* (continued)

	Age group (years)					
Country / Year	**(a)0**	**1–4**	**5–14**	**15–24**	**25–34**	**35–44**
Females						
Australia (1992)	**599**	**36**	**14**	**38**	**50**	**93**
Canada (1990)	609	33	18	37	53	103
Chile (1989)	1,540	74	27	43	75	159
France (1990)	624	31	16	38	60	116
Germany (1990)	606	38	18	37	53	126
Greece (1990)	956	26	16	35	51	84
Hong Kong (1989)	628	27	14	31	44	86
Iceland (1991)	550	24	10	29	14	97
Ireland (1990)	726	29	15	36	54	104
Israel (1989)	961	46	18	32	51	97
Italy (1989)	787	26	14	27	43	93
Japan (1991)	421	36	13	25	40	89
Malta (1991)	654	48	7	12	34	108
Netherlands (1990)	611	40	18	28	45	104
New Zealand (1989)	865	39	20	59	56	128
Norway (1990)	573	32	18	29	49	106
Poland (1991)	1,301	47	23	39	67	177
Russian Federation (1990)	1,901	163	35	66	94	190
Singapore (1990)	617	27	19	37	66	131
Spain (1989)	696	38	20	40	56	99
Sweden (1989)	493	28	12	32	45	111
Switzerland (1991)	530	42	15	44	62	99
United Kingdom (1991)	634	34	16	32	45	108
USA (1989)	877	44	20	52	75	139
Yugoslavia (1990)	1,792	62	24	35	57	137

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Table S17: *Age-specific death rates, all causes, by sex, selected countries, latest year (per 100,000 population)* (continued)

	Age group (years)					
Country / Year	**45–54**	**55–64**	**65–74**	**75 and over**	**Crude rate**	**ASR[(b)]**
Females						
Australia (1992)	**239**	**636**	**1,677**	**7,284**	**656**	**551**
Canada (1990)	268	687	1,698	6,885	653	546
Chile (1989)	406	920	2,276	8,607	510	738
France (1990)	255	538	1,193	7,295	871	493
Germany (1990)	300	745	1,919	8,909	1,208	670
Greece (1990)	204	522	1,744	8,295	873	600
Hong Kong (1989)	246	642	1,761	5,644	439	na
Iceland (1991)	227	660	1,488	7,514	614	524
Ireland (1990)	311	879	2,333	9,230	829	729
Israel (1989)	249	811	2,253	8,243	597	693
Italy (1989)	243	590	1,616	7,536	859	568
Japan (1991)	208	459	1,217	6,229	605	457
Malta (1991)	209	702	2,336	10,212	781	728
Netherlands (1990)	257	656	1,646	7,879	822	571
New Zealand (1989)	359	860	2,133	8,098	752	677
Norway (1990)	239	671	1,774	8,313	1,033	593
Poland (1991)	426	1,023	2,602	10,449	949	854
Russian Federation (1990)	481	1,122	2,740	9,709	1,001	893
Singapore (1990)	353	947	2,516	7,612	462	729
Spain (1989)	223	526	1,504	7,747	770	558
Sweden (1989)	248	594	1,581	7,650	1,029	550
Switzerland (1991)	224	523	1,401	7,465	880	514
United Kingdom (1991)	294	839	2,220	8,502	1,124	655
USA (1989)	340	882	2,011	7,434	814	626
Yugoslavia (1990)	365	919	2,459	9,615	825	811

(a) Infant mortality per 100,000 births.

(b) Age-standardised rate. Reference population is the European standard population (WHO 1993). Standard death rates in this table are different from the standard rates in other tables because of the use of a different reference population.

Sources: World Health Organization 1992, 1993; AIHW unpublished data

Table S18: *Age-standardised death rates,*(a) *by sex and ICD–9 chapter, selected years, 1921 to 1992 (per 100,000 population)*

Sex / ICD–9 chapter	1921	1941	1961	1981	1986	1989	1990	1991	1992
Males									
Infectious and parasitic	208	92	17	5	5	6	6	6	6
Neoplasms	154	175	192	236	234	237	232	230	233
Endocrine, nutritional	16	23	16	18	19	21	23	24	24
Blood diseases	10	5	4	3	4	3	3	3	3
Mental disorders	7	4	5	9	12	15	14	12	13
Nervous system diseases	46	25	14	13	14	16	15	15	17
Circulatory diseases	376	614	733	545	446	414	383	365	360
Respiratory diseases	201	145	105	94	82	95	79	75	81
Digestive diseases	58	56	38	35	31	32	29	28	26
Genitourinary diseases	122	133	42	15	13	13	13	13	12
Skin diseases	5	3	2	1	1	1	1	1	1
Musculoskeletal diseases	7	5	4	3	3	3	3	3	3
Congenital diseases	9	10	10	7	5	5	5	5	5
Perinatal diseases	55	43	21	7	6	6	6	5	5
Ill-defined conditions	300	98	14	6	6	6	6	5	5
Injury and poisoning	116	103	103	80	71	70	68	64	61
All causes	**1,689**	**1,532**	**1,317**	**1,075**	**953**	**944**	**885**	**853**	**855**
Females									
Infectious and parasitic	157	58	9	3	3	4	4	4	4
Neoplasms	155	159	135	133	141	139	138	140	137
Endocrine, nutritional	26	40	20	15	14	14	14	15	15
Blood diseases	13	6	4	3	2	2	2	2	2
Mental disorders	3	3	2	6	9	11	10	9	10
Nervous system diseases	36	21	9	8	10	12	11	11	12
Circulatory diseases	334	503	493	333	284	267	248	234	237
Respiratory diseases	155	111	43	31	31	42	34	33	37
Digestive diseases	56	39	23	19	20	19	19	18	17
Genitourinary diseases	65	74	19	11	10	10	10	10	9
Complications of pregnancy	24	14	3	–	–	–	–	–	–
Skin diseases	5	3	2	–	1	1	1	1	1
Musculoskeletal diseases	9	6	4	4	4	5	4	4	5
Congenital diseases	7	9	8	6	5	5	5	4	4
Perinatal diseases	41	34	15	5	5	5	5	4	4
Ill-defined conditions	237	70	14	4	4	4	4	3	3
Injury and poisoning	34	39	42	30	28	27	25	25	24
All causes	**1,357**	**1,187**	**845**	**611**	**570**	**563**	**532**	**516**	**520**

(a) Reference population is the 30 June 1988 Australian population, classified by five-year age groups.

Sources: d'Espaignet et al. 1991; AIHW unpublished data

Table S19: *Age-standardised death rates,*[(a)] *by sex and ICD–9 chapter, States and Territories, 1992 (per 100,000 population)*

Sex / ICD–9 chapter	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Males									
Infectious and parasitic	8	5	6	6	5	3	2	32	6
Neoplasms	240	235	231	220	216	231	201	290	233
Endocrine, nutritional	25	32	19	22	16	17	20	71	24
Blood diseases	4	2	3	3	1	1	4	3	3
Mental disorders	14	14	11	11	10	12	6	13	13
Nervous system diseases	15	19	16	20	15	17	20	19	17
Circulatory diseases	380	346	358	326	354	382	300	388	360
Respiratory diseases	82	79	76	72	85	105	74	200	81
Digestive diseases	28	28	24	25	27	16	20	23	26
Genitourinary diseases	12	13	13	12	10	8	6	19	12
Skin diseases	1	–	1	1	1	–	2	–	1
Musculoskeletal diseases	3	3	3	2	2	4	–	6	3
Congenital diseases	5	5	6	5	3	7	7	9	5
Perinatal diseases	7	4	6	4	5	5	3	6	5
Ill-defined conditions	5	3	3	7	4	14	4	31	5
Injury and poisoning	60	57	67	59	63	78	51	106	61
All causes	**887**	**845**	**845**	**796**	**817**	**901**	**720**	**1,217**	**855**
Females									
Infectious and parasitic	4	4	3	2	3	2	8	36	4
Neoplasms	136	142	134	138	129	152	121	240	137
Endocrine, nutritional	13	18	14	15	14	14	13	73	15
Blood diseases	2	2	2	1	2	2	2	–	2
Mental disorders	9	11	9	12	8	8	2	10	10
Nervous system diseases	12	13	10	15	11	15	11	15	12
Circulatory diseases	249	228	239	209	229	256	222	225	237
Respiratory diseases	38	35	35	31	37	53	38	166	37
Digestive diseases	17	16	16	19	15	19	13	22	17
Genitourinary diseases	10	8	11	7	7	8	8	28	9
Complications of pregnancy	–	–	–	–	–	–	–	–	–
Skin diseases	1	–	1	1	1	1	1	5	1
Musculoskeletal diseases	5	5	5	3	2	4	2	1	5
Congenital diseases	4	4	5	4	3	7	1	7	4
Perinatal diseases	5	3	4	5	3	2	6	13	4
Ill-defined conditions	3	3	3	3	4	14	6	29	3
Injury and poisoning	21	22	28	25	24	32	16	53	24
All causes	**530**	**513**	**521**	**492**	**491**	**590**	**470**	**924**	**520**

(a) Reference population is the 30 June 1988 Australian population, classified by five-year age groups.

Source: AIHW unpublished data

Table S20: *Age-standardised death rates,*[(a)] *by selected ICD–9 chapters and sex, selected countries, latest year (per 100,000 population)*

	ICD–9 chapter					
Country / Year	**Infectious & parasitic**	**Neoplasms**	**Circulatory**	**Digestive**	**Injury & poisoning**	**All causes**
Males						
Australia (1992)	**7**	**248**	**378**	**29**	**61**	**897**
Canada (1990)	6	258	356	34	70	930
Chile (1989)	42	215	344	107	150	1,204
France (1990)	12	298	267	52	102	945
Germany (1990)	8	269	510	56	69	1,119
Greece (1990)	6	217	420	25	59	896
Iceland (1991)	3	234	407	18	75	893
Ireland (1990)	7	268	547	28	63	1,189
Israel (1989)	15	174	388	27	66	907
Italy (1989)	4	286	384	60	62	977
Japan (1991)	13	228	268	38	62	801
Malta (1991)	7	231	492	43	41	1,041
Netherlands (1990)	6	296	391	31	43	1,001
New Zealand (1989)	6	261	471	28	87	1,068
Norway (1990)	7	223	464	27	77	1,010
Poland (1991)	14	297	797	48	140	1,566
Russian Federation (1990)	26	284	800	47	198	1,604
Singapore (1990)	31	259	411	32	59	1,097
Spain (1989)	12	251	340	62	75	954
Sweden (1989)	6	197	444	31	74	906
Switzerland (1991)	17	263	360	28	95	914
United Kingdom (1991)	5	274	462	30	45	1,025
USA (1989)	14	246	428	37	89	1,027
Yugoslavia (1990)	14	228	613	51	92	1,237

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Table S20: *Age-standardised death rates,*[(a)] *by selected ICD–9 chapters and sex, selected countries, latest year (per 100,000 population)* (continued)

Country / Year	Infectious & parasitic	Neoplasms	Circulatory	Digestive	Injury & poisoning	All causes
	ICD–9 chapter					
Females						
Australia (1992)	**4**	**149**	**248**	**18**	**24**	**551**
Canada (1990)	4	163	209	20	27	546
Chile (1989)	25	162	244	52	35	738
France (1990)	7	129	159	27	44	493
Germany (1990)	5	160	327	30	31	670
Greece (1990)	4	111	322	12	23	600
Iceland (1991)	6	157	214	16	21	524
Ireland (1990)	5	182	319	22	26	729
Israel (1989)	14	146	291	19	37	693
Italy (1989)	2	146	253	29	25	568
Japan (1991)	6	113	181	19	26	457
Malta (1991)	4	141	388	22	16	728
Netherlands (1990)	4	162	217	23	23	571
New Zealand (1989)	5	188	283	21	33	677
Norway (1990)	4	150	252	19	33	593
Poland (1991)	5	155	476	25	38	854
Russian Federation (1990)	10	134	534	24	50	893
Singapore (1990)	17	153	295	15	26	729
Spain (1989)	6	118	251	29	22	558
Sweden (1989)	4	144	252	19	31	550
Switzerland (1991)	7	146	215	16	40	514
United Kingdom (1991)	3	184	279	24	19	655
USA (1989)	10	162	266	23	31	626
Yugoslavia (1990)	8	129	467	23	33	811

(a) Reference population is the Europen standard population (WHO 1993). Standard death rates in this table are different from the standard rates in other tables because of the use of a different reference population.

Sources: World Health Organization 1992, 1993; AIHW unpublished data

Other health conditions

Table S21: *Notifiable diseases, 1987 to 1992 (number)*

Disease	1987	1988	1989	1990	1991	1992
Arbovirus infection, nec	1,085	897	2,809	2,008	201	303
Dengue[a]	nn	nn	nn	nn	46	366
Ross River virus[a]	nn	nn	nn	nn	3,532	5,630
Brucellosis	12	16	20	46	28	29
Campylobacteriosis	2,923	4,082	4,279	5,683	8,672	9,135
Chancroid	4	4	3	13	–	5
Cholera	–	2	–	1	–	3
Chlamydial infection[b]	274	268	504	5	4,044	6,293
Diphtheria	32	61	1	7	8	14
Donovanosis	148	133	99	91	72	78
Gonococcal infection	4,984	4,082	3,154	1,919	2,530	2,908
Haemophilus influenzae, type b infection	nn	nn	nn	nn	549	501
Hepatitis A	715	600	460	530	2,195	2,109
Hepatitis B	1,605	1,683	3,017	2,970	3,652	5,219
Hepatitis C	nn	nn	nn	nn	4,116	8,812
Hepatitis, nec	131	69	43	707	338	70
Hydatid infection	17	15	15	16	44	38
Legionellosis	96	67	104	90	110	185
Leprosy	31	20	34	31	13	16
Leptospirosis	133	104	99	121	169	159
Listeriosis	nn	nn	nn	nn	44	38
Lymphogranuloma venereum	–	–	–	–	–	3
Malaria	574	601	770	882	790	712
Measles	nn	248	169	880	1,380	1,425
Meningococcal infection	96	126	204	295	285	292
Mumps	nn	nn	nn	nn	nn	23
Ornithosis	13	21	25	23	136	94
Pertussis	291	153	614	862	337	739
Plague	–	–	–	–	–	–
Poliomyelitis	–	–	–	–	–	–
Q fever	355	424	353	431	595	543
Rabies	–	–	–	–	–	–
Rubella[c]	3	2	–	2	620	3,810
Salmonellosis	2,739	3,484	4,492	4,564	5,440	4,614
Shigellosis	586	581	779	610	902	694
Syphilis	3,190	3,056	2,099	1,754	2,053	2,695

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Table S21: *Notifiable diseases, 1987 to 1992 (number)* (continued)

Disease	1987	1988	1989	1990	1991	1992
Tetanus	5	5	11	6	7	14
Tuberculosis(d)	868	925	902	979	903	nya
Typhoid	47	40	57	70	89	50
Viral haemorrhagic fever	–	–	–	–	–	–
Yellow fever	–	–	–	–	–	–
Yersiniosis	122	172	241	433	515	567

nec not elsewhere classified.

nn not notifiable.

nya not yet available.

(a) Dengue fever and Ross River fever included in the Arbovirus infection from 1987 to 1990.

(b) Trachoma only from 1987 to 1990.

(c) Congenital rubella syndrome only from 1987 to 1990.

(d) Data from National Tuberculosis Notification System.

Source: Communicable Diseases Network–Australia New Zealand–National Notifiable Diseases Surveillance System, personal communication

Table S22: ***Virus and selected non-virus reports,(a) 1987 to 1992 (number)***

	1987	1988	1989	1990	1991	1992
Virus						
Measles, mumps, rubella						
Measles	136	45	69	221	256	204
Mumps	72	49	60	54	32	48
Rubella	394	196	582	300	246	753
Hepatitis viruses						
Hepatitis A	483	380	221	262	444	371
Hepatitis B	3,021	2,466	3,061	2,981	2,182	2,303
Hepatitis C	–	–	–	115	1,212	2,603
Hepatitis D	–	–	–	1	37	45
Hepatitis E	–	–	–	–	–	1
Hepatitis, other non-A or B	–	–	2	5	18	7
Arboviruses						
Alphaviruses						
Ross River	926	679	2,076	669	833	1,319
Other alphaviruses	3	5	67	10	36	251
Flaviviruses						
Dengue	14	11	39	68	29	385
MVE virus	2	1	1	2	10	1
Other flaviviruses / not typed	28	16	32	21	47	57
Other DNA viruses						
Adenovirus	1,298	1,476	1,641	1,432	1,518	1,722
Cytomegalovirus	1,484	1,424	1,614	1,810	1,820	1,728
Epstein–Barr virus	802	781	1,051	1,211	1,360	1,625
Herpes simplex						
HSV type 1	3,949	3,636	2,948	3,343	3,073	3,502
HSV type 2	7,197	6,414	4,776	4,431	3,810	4,330
HSV not typed	689	1,403	2,637	1,180	820	825
Herpes Type 6	–	–	1	1	3	2
Varicella zoster	319	346	436	450	522	684
Herpes virus group / not typed	119	120	366	210	114	36
Other(b)	12	13	16	20	67	206
Other RNA viruses						
Coxsackievirus A	75	165	33	57	59	43
Coxsackievirus B	239	179	117	132	154	128
Echovirus	318	524	515	204	154	496
HIV–1	10	60	55	75	54	45
HTLV–1	–	–	–	3	8	2
Influenza						
Influenza A	305	1,543	572	255	60	1,322
Influenza B	398	50	435	41	408	126
Other	6	11	11	4	6	2
Poliovirus	231	176	239	248	194	185
Parainfluenza	735	1,056	970	835	805	974

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Table S22: *Virus and selected non-virus reports,*[(a)] *1987 to 1992 (number)* (continued)

	1987	1988	1989	1990	1991	1992
Respiratory syncytial virus	2,104	1,931	3,066	3,132	2,555	3,554
Rhinovirus	553	773	759	470	653	683
Rotavirus	1,545	1,638	1,693	1,876	2,642	2,134
Other[(c)]	811	692	621	914	870	945
Non-viral						
Chlamydia						
Trachomatis	3,917	2,822	3,394	3,250	2,626	2,563
Pneumoniae	–	–	–	–	2	14
Psittaci	62	90	92	86	139	97
Other	–	–	–	–	1	16
Mycoplasma						
Mycoplasma pneumoniae	993	1,240	703	402	381	1,579
Mycoplasma hominis	–	–	–	–	2	4
Rickettsiae						
Coxiella burneti (Q fever)	351	272	227	250	240	269
Other rickettsiae	3	2	4	2	1	31
Total	**33,604**	**32,138**	**35,283**	**30,977**	**30,570**	**38,220**

(a) As reported by virus laboratories through the Commonwealth Diseases Intelligence network. Data collected under the Notifiable Diseases Returns (Table S21) may bear little or no correlation to that collected under the CDI laboratory scheme. Although the latter is a sampling program, the Notifiable Diseases data depend on voluntary reporting by medical practitioners, etc.

(b) Other DNA viruses include papovavirus (untyped), molluscum contagiosum, Orf virus, parvovirus, milkers nodule virus, poxvirus (untyped) and cowpox virus.

(c) Other RNA viruses include enterovirus type 70 and 71, picomavirus (not typed), enterovirus (not typed), paramyxovirus (unspecified), reovirus, coronavirus, astrovirus, calcivirus, Norwalk agent and small virus-like particles.

Sources: DHHCS 1992; DHHLGCS 1993a

Table S23: *Characteristics of AIDS cases, by age, sex, State/Territory, exposure category and defining condition, 1985 to 1993*

Description	1985	1986	1987	1988	1989	1990	1991	1992	1993(a)
Total cases	**127**	**227**	**381**	**531**	**600**	**653**	**763**	**692**	**231**
Mean age (years)									
Males	37	38	37	38	38	38	38	40	40
Females	46	53	41	31	34	38	36	40	43
Males (per cent)	**90.6**	**96.9**	**96.1**	**97.2**	**97.7**	**97.5**	**96.8**	**95.2**	**96.0**
State/Territory (per cent)									
NSW	70.9	70.5	65.6	60.0	58.1	62.2	54.1	53.2	51.5
Vic	9.4	15.9	20.7	22.3	21.4	18.6	23.7	23.6	30.3
Qld	9.4	5.7	6.6	7.4	8.2	9.1	10.8	10.9	6.9
WA	6.3	4.8	3.4	4.7	5.0	4.0	4.9	5.1	1.7
SA	1.6	2.2	2.4	4.2	4.8	3.8	5.0	4.5	5.6
Tas	0.8	–	0.5	0.2	1.0	0.8	0.3	1.3	–
NT	1.6	–	–	–	0.2	0.3	0.7	0.7	0.9
ACT	–	0.9	0.8	1.5	1.5	1.5	1.1	1.0	3.0
Exposure category (per cent)									
Male homosexual / bisexual contact	81.9	87.2	86.9	88.9	86.5	85.7	82.1	79.1	82.3
Male homosexual / bisexual contact and ID use	0.8	4.8	2.4	3.0	2.7	2.0	3.3	4.2	5.6
ID use (female and heterosexual male)	–	0.9	0.5	2.1	2.2	1.8	3.6	1.7	0.9
Heterosexual contact	0.8	–	1.6	1.7	1.3	3.2	4.5	6.8	6.1
Haemophilia / coagulation disorder	0.8	0.9	1.8	1.3	2.2	1.8	1.3	1.9	0.9
Receipt of blood transfusion, blood components or tissue	13.4	5.3	5.2	1.3	1.7	1.7	2.0	2.0	1.7
Mother with / at risk for HIV infection	0.8	–	–	0.2	0.2	0.5	0.4	0.4	–
Other / undetermined	1.6	0.9	1.6	1.7	3.5	3.5	3.3	4.1	2.6
AIDS–defining condition (per cent)									
Pneumocystis carinii pneumonia (PCP)	40.9	37.4	41.5	40.2	34.7	28.3	31.2	27.0	26.8
Kaposi's sarcoma (KS)-skin	20.5	15.4	17.1	15.1	14.0	11.1	11.8	11.6	10.8
PCP and other (not KS)	3.1	4.4	7.1	5.5	3.5	6.3	3.9	5.4	1.7
HIV encephalopathy	–	–	1.1	2.3	4.2	4.3	2.6	2.0	3.5
Other	35.4	42.7	33.3	37.2	43.7	50.4	50.8	54.3	57.1

(a) Diagnosed by 30 June and reported by 30 September.

Source: National Centre in HIV Epidemiology and Clinical Research

Table S24: *Leading cancers,*(a) *new cases and deaths by type and sex, 1988*

	New cases				Deaths		
Cancer	**Number**	**Per cent**	**Rate(b)**	**Lifetime risk(c)**	**Number**	**Per cent**	**Rate(b)**
Males							
Lung	4,792	15.8	65.2	1 in 17	4,595	27.4	63.0
Prostate	4,566	15.0	67.5	1 in 23	1,883	11.2	29.0
Melanoma	3,087	10.2	39.6	1 in 30	478	2.9	6.3
Colon	2,691	8.9	37.1	1 in 33	1,550	9.3	22.7
Rectum	1,732	5.7	23.3	1 in 47	652	3.9	9.1
Bladder	1,652	5.4	23.2	1 in 55	502	3.0	7.5
Unknown primary	1,376	4.5	19.1	1 in 67	969	5.8	13.6
NHL(a)	1,146	3.8	15.2	1 in 80	592	3.5	8.1
Stomach	1,135	3.7	15.8	1 in 81	861	5.1	12.3
Kidney	799	2.6	10.7	1 in 108	378	2.3	5.2
All cancers	**30,511**	**100.0**	**414.6**	**1 in 3**	**16,747**	**100.0**	**234.7**
Female							
Breast	6,540	24.8	75.3	1 in 15	2,361	18.7	26.3
Melanoma	2,751	10.4	33.5	1 in 37	326	2.6	3.6
Colon	2,643	10.0	28.7	1 in 42	1,535	12.1	16.4
Lung	1,681	6.4	18.8	1 in 55	1,520	12.0	16.9
Unknown primary	1,190	4.5	12.7	1 in 105	832	6.6	8.8
Rectum	1,170	4.4	12.9	1 in 89	406	3.2	4.3
Cervix	1,061	4.0	12.6	1 in 95	345	2.7	3.9
Uterus	1,057	4.0	12.1	1 in 84	194	1.5	2.1
NHL(d)	933	3.5	10.5	1 in 105	478	3.8	5.2
Ovary	890	3.4	10.2	1 in 104	610	4.8	6.9
All cancers	**26,490**	**100.0**	**297.5**	**1 in 4**	**12,652**	**100.0**	**137.7**

(a) Rankings are based on the number of new cases; excludes non-melanocytic skin cancers.

(b) Age-standardised rates are expressed per 100,000 population using the 1988 Australian population.

(c) Lifetime risk—a measure which approximates the risk of contracting a particular cancer in a lifetime if the risks at the year of estimation remained throughout a person's life. For the purposes of this table, 'lifetime' is defined as ages 0 to 74.

(d) Non-Hodgkin's lymphoma.

Source: Jelfs et al. 1994

Table S25: *Major cancers, age-standardised incidence rates,*[(a)] *by sex, 1982 to 1988 (per 100,000 population)*

Cancer	1982	1983	1984	1985	1986	1987	1988
Males							
Lung	74.0	73.9	73.7	75.5	71.3	70.7	65.2
Prostate	63.3	64.6	65.4	69.2	68.0	68.9	67.5
Melanoma	24.4	24.9	27.1	30.3	32.2	36.8	39.6
Colon	35.1	35.7	36.9	41.2	39.6	37.9	37.1
Rectum	22.6	22.6	22.0	23.1	21.8	22.4	23.3
Bladder	27.4	25.5	25.8	27.7	25.1	23.1	23.2
Non-Hodgkin's lymphoma	13.6	12.6	12.8	14.5	14.9	15.8	15.2
All cancers	408.0	402.3	408.7	431.2	419.7	418.5	414.6
Females							
Breast	70.5	71.1	72.3	72.3	72.3	77.3	75.3
Melanoma	23.3	25.5	25.8	28.5	28.0	31.8	32.3
Colon	30.8	30.1	31.0	32.5	31.7	30.3	28.7
Lung	16.2	17.1	17.6	18.1	18.3	18.2	18.8
Rectum	14.0	13.7	13.7	14.2	13.1	13.1	12.9
Cervix	13.4	13.7	13.4	13.3	13.1	13.3	12.6
Body of uterus	11.7	11.8	12.8	12.4	13.0	12.4	12.1
Bladder	7.9	6.6	7.3	6.8	7.5	6.7	6.8
Non-Hodgkin's lymphoma	10.0	9.5	9.9	10.1	10.0	10.6	10.5
All cancers	285.0	290.4	294.6	298.8	295.8	300.8	297.5

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

Source: AIHW unpublished data

Table S26: *Major cancers, average annual age-standardised incidence rates,*[(a)] *by sex, States and Territories 1984–88 and Australia 1988 (per 100,000 population)*

Cancer	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Males									
Lung	68.9	69.1	79.5	67.9	62.4	71.1	62.6	64.9	65.2
Prostate	59.1	63.0	77.4	65.4	66.7	56.2	50.3	36.4	67.5
Melanoma	35.7	21.6	53.6	33.5	32.0	23.1	36.8	12.8	39.6
Colon	35.3	38.9	42.7	35.1	30.6	34.8	34.6	–	37.1
Rectum	20.3	24.1	20.8	21.9	22.7	19.2	24.3	12.2	23.3
Females									
Breast	64.9	76.1	79.2	74.3	65.8	64.2	70.5	45.7	75.3
Melanoma	29.0	22.3	45.4	29.3	32.3	29.2	29.3	10.2	32.3
Colon	27.8	32.3	36.0	28.0	26.2	29.8	31.2	17.4	28.7
Lung	15.5	19.2	18.9	19.6	14.2	18.6	18.9	15.2	18.8
Rectum	12.7	14.3	12.6	13.1	13.1	14.5	14.8	3.1	12.9

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

Source: Jelfs et al. 1994

Table S27: *Major cancers, age-standardised incidence rates,*[(a)] *by sex, selected countries 1984–88 and Australia 1988 (per 100,000 population)*

Males	Colon	Rectum	Lung	Melanoma	Prostate	All cancers
Australia	26.5	17.5	46.9	33.1	41.8	302.9
Brazil	17.0	11.3	85.7	5.8	49.6	191.7
Canada	27.8	16.6	68.5	6.7	51.4	318.1
England and Wales	17.1	13.7	65.4	3.0	23.1	240.0
Italy	24.0	14.8	82.3	3.9	25.5	344.1
Japan	14.8	11.6	41.5	0.2	6.6	265.4
Netherlands	19.7	16.2	83.4	3.9	29.6	272.5
New Zealand (non-Maori)	30.9	20.4	51.7	18.6	35.4	283.4
USA	27.4	13.4	56.4	14.6	51.9	293.7

Females	Colon	Rectum	Lung	Melanoma	Breast	All cancers
Australia	20.8	9.6	14.2	28.3	62.3	235.9
Brazil	11.0	8.2	16.8	3.7	78.5	215.9
Canada	23.6	10.2	23.9	7.0	71.1	253.4
England and Wales	14.6	7.8	20.5	5.0	56.1	198.8
Italy	17.3	7.9	8.2	4.4	66.0	215.3
Japan	10.1	6.3	11.7	0.2	21.9	155.2
Netherlands	17.1	10.3	9.1	5.6	68.1	194.8
New Zealand (non-Maori)	30.5	12.3	15.7	23.0	64.3	248.0
USA	20.7	8.4	32.1	11.6	88.5	273.6

(a) Age-standardised to the World Standard Population.

Source: Parkin et al. (eds) 1992

Table S28: *Dental caries experience*[(a)] *of 6-year-old and 12-year-old school children, States and Territories, 1988 to 1992 (mean number of teeth)*

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
6-year-olds (dmft)									
1988	1.83	1.89	2.40	1.52	2.02	1.66	1.29	1.81	1.93
1989	2.21	2.16	2.34	1.62	2.21	1.70	1.17	2.04	2.16
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
12-year-olds (DMFT)									
1988	1.24	1.93	1.85	1.96	1.69	1.29	1.20	1.34	1.62
1989	1.33	1.72	1.66	2.11	1.46	1.06	1.12	1.10	1.56
1990	1.32	(b)	1.69	1.75	1.26	1.11	1.03	1.18	1.44
1991	1.18	(b)	1.54	1.43	1.06	1.18	0.91	1.26	1.29
1992	1.19	(b)	1.50	1.22	1.04	0.98	0.76	0.91	1.22

(a) As measured by dmft / DMFT index. Beginning in 1989, the dmft index (number of decayed, missing and filled primary teeth) was recorded in all States and Territories other than Queensland. In Queensland during 1989 the dft (number of decayed and filled primary teeth) was recorded. Prior to 1989 the dft index was recorded in all States and Territories. The increase in caries experience in 1989 may therefore be associated with the adoption of the more comprehensive dmft index.

(b) Insufficient numbers examined to provide an estimate.

Source: AIHW Dental Statistics and Research Unit unpublished data

Table S29: *Primary teeth with caries experience (dmft),*[(a)] *4- to 10-year-old children, 1977 and 1988 to 1992 (mean number of teeth)*

	Age (years)						
	Four	Five	Six	Seven	Eight	Nine	Ten
1977	2.86	2.96	3.13	3.35	3.37	3.01	2.23
1988	1.68	1.73	1.93	2.12	2.20	2.23	1.86
1989	(b)	2.01	2.15	2.38	2.31	2.26	1.88
1990	(b)	1.85	2.06	2.20	2.31	2.28	1.78
1991	(b)	1.78	1.94	2.13	2.24	2.22	1.81
1992	(b)	1.80	1.95	1.93	2.21	2.11	1.74

(a) Beginning in 1989, the dmft index (number of decayed, missing and filled primary teeth) was recorded in all States and Territories other than Queensland. In Queensland during 1989 the dft (number of decayed and filled primary teeth) was recorded. Prior to 1989 the dft index was recorded in all States and Territories. The increase in caries experience in 1989 may therefore be associated with the adoption of the more comprehensive dmft index.

(b) Insufficient numbers examined to provide an estimate.

Source: AIHW Dental Statistics and Research Unit unpublished data

Table S30: *Permanent teeth with caries experience (DMFT), 6- to 12-year-old children, 1977 and 1988 to 1992 (mean number of teeth)*

	Age (years)						
	Six	Seven	Eight	Nine	Ten	Eleven	Twelve
1977	0.51	1.21	1.94	2.50	3.10	3.92	4.80
1988	0.08	0.28	0.49	0.70	0.99	1.26	1.62
1989	0.09	0.26	0.46	0.65	0.83	1.37	1.56
1990	0.10	0.24	0.42	0.63	0.76	1.00	1.44
1991	0.09	0.24	0.40	0.56	0.83	0.91	1.29
1992	0.09	0.21	0.38	0.53	0.69	0.90	1.22

Source: AIHW Dental Statistics and Research Unit unpublished data

Table S31: *Current smokers, by age group and sex, 1974 to 1989 (per cent)*

	Year of survey					
Age group	**1974**	**1976**	**1980**	**1983**	**1986**	**1989**
Males						
16–19	37.7	37.2	35.7	31.9	31.2	20.0
20–24	52.0	47.6	56.5	44.9	41.1	41.0
25–29	49.2	46.8	48.6	49.2	38.8	38.9
30–34	52.4	45.7	40.0	43.5	34.5	36.7
35–39	48.1	46.9	41.8	42.2	34.7	35.4
40–44	45.9	43.4	43.1	42.6	36.6	32.3
45–49	47.2	40.7	47.4	43.1	29.0	26.3
50–54	46.8	53.9	47.1	38.0	35.5	22.1
55–59	40.6	39.7	40.1	38.1	34.8	25.5
60–69	36.2	36.0	26.8	33.7	29.2	21.4
70 and over	31.4	35.3	18.5	26.6	16.3	20.8
Total	**45.3**	**43.9**	**41.1**	**40.3**	**33.4**	**30.2**
Females						
16–19	29.8	32.2	37.3	44.9	27.9	31.1
20–24	38.0	44.1	40.0	44.9	41.2	37.7
25–29	37.4	43.5	40.5	34.5	39.0	36.7
30–34	30.4	37.9	35.8	32.1	31.3	30.4
35–39	29.4	28.0	33.3	28.8	29.0	26.4
40–44	27.5	34.4	29.5	28.1	30.0	24.2
45–49	32.6	35.8	20.0	38.5	25.1	28.8
50–54	37.0	38.3	31.3	25.5	27.6	27.9
55–59	25.4	17.9	26.1	29.1	23.6	17.6
60–69	16.2	18.8	23.0	22.2	20.9	19.6
70 and over	9.9	11.3	10.1	8.4	11.6	10.5
Total	**29.6**	**32.5**	**31.1**	**30.9**	**28.9**	**27.0**

Source: Hill, White & Gray 1988, 1991

Hospital morbidity and utilisation

Table S32: *Separation rates from public acute and DVA hospitals, by sex and age group, States and Territories, 1991–92 or latest year*[a] *(per 1,000 population)*

Sex / Age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Males									
Less than 1	545.7	408.3	428.6	477.6	584.4	371.5	777.4	933.5	491.5
1–14	102.3	86.2	99.5	108.0	124.6	68.0	78.2	128.1	99.1
15–34	85.1	70.6	101.4	92.6	93.3	76.5	67.9	104.5	85.2
35–49	108.2	94.0	121.4	107.2	117.1	87.4	104.3	112.3	106.8
50–64	212.2	193.6	222.7	217.3	236.0	200.5	278.6	223.6	212.3
65–74	435.9	390.2	395.2	527.0	487.7	375.4	573.4	369.4	429.5
75 and over	620.1	537.2	587.4	810.0	685.9	598.8	660.9	560.0	615.1
All ages	160.9	137.8	159.9	166.9	183.8	137.8	141.9	147.5	156.2
Females									
Less than 1	403.7	295.1	319.6	373.1	395.8	323.9	537.8	783.8	363.2
1–14	72.9	59.9	73.0	80.2	90.1	48.4	56.8	100.3	71.1
15–34	208.5	187.2	206.2	223.2	221.6	208.9	205.5	260.1	205.6
35–49	134.6	126.6	131.8	146.2	133.7	109.6	146.0	156.3	132.9
50–64	185.2	152.5	197.0	190.6	188.7	150.8	216.9	188.2	178.8
65–74	296.5	249.2	291.8	315.7	322.0	273.6	352.2	295.3	287.3
75 and over	382.6	318.0	366.6	432.1	384.8	329.0	403.9	400.0	365.9
All ages	185.4	160.5	177.9	192.5	197.0	162.5	180.8	203.2	178.8
Persons	**173.4**	**149.4**	**168.9**	**179.8**	**190.5**	**150.5**	**161.7**	**173.9**	**167.7**

(a) Queensland 1990, Northern Territory 1990–91. Department of Veterans' Affairs (DVA) hospital data for 1991–92 is included for NSW, Vic, Qld, WA, SA and Tas only.

Sources: Cook & Sardana 1994; AIHW unpublished data

Table S33: *Occupied bed-days in public acute and DVA hospitals, by sex and age group, States and Territories, 1991–92 or latest year*[(a)] *(per 1,000 population)*

Sex / Age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Males									
Less than 1	2,921.3	2,329.1	2,683.0	2,610.1	2,963.4	1,920.5	4,876.5	8,075.9	2,770.2
1–14	244.3	200.7	248.8	271.7	294.6	169.0	199.2	745.1	244.2
15–34	323.0	240.2	421.3	317.4	306.7	310.9	329.3	638.8	319.9
35–49	443.5	353.3	522.3	397.0	436.7	386.1	423.4	715.7	429.5
50–64	1,128.9	939.6	1,265.4	1,023.9	1,112.7	1,002.7	1,314.6	1,611.2	1,093.6
65–74	2,813.6	2,423.3	2,865.4	3,006.3	2,901.7	2,611.5	3,945.5	3,056.9	2,752.9
75 and over	5,545.8	4,976.1	6,164.2	6,871.2	6,062.0	6,368.9	7,386.5	6,293.3	5,699.0
All ages	835.3	690.3	885.6	796.6	897.8	792.1	752.5	1,002.1	807.4
Females									
Less than 1	2,341.2	1,880.6	2,159.8	2,221.0	2,497.2	1,568.9	3,642.2	7,655.6	2,258.6
1–14	185.9	152.3	189.4	217.5	235.1	131.0	162.8	687.2	189.2
15–34	765.5	695.3	776.2	773.4	766.2	807.1	839.9	1,196.7	757.5
35–49	527.4	455.8	566.4	515.6	476.4	461.4	612.1	826.6	511.9
50–64	890.4	706.3	992.7	859.4	860.3	816.8	1,051.1	1,568.2	855.7
65–74	2,009.0	1,694.2	2,174.0	2,099.2	2,021.0	2,119.7	2,573.2	2,292.0	1,969.3
75 and over	4,082.5	3,495.5	4,709.1	4,582.8	4,039.1	4,909.5	4,667.6	4,654.3	4,074.7
All ages	966.3	819.9	956.0	931.4	989.9	986.7	921.5	1,194.2	927.2
Persons	**902.0**	**756.5**	**920.7**	**864.7**	**944.8**	**891.7**	**838.5**	**1,093.5**	**868.2**

(a) Queensland 1990, Northern Territory 1990–91. Department of Veterans' Affairs (DVA) hospital data for 1991–92 is included for NSW, Vic, Qld, WA, SA and Tas only.

Sources: Cook & Sardana 1994; AIHW unpublished data

Table S34: *Occupied bed-days in private acute and private psychiatric hospitals, by sex and age group, States and Territories, 1991–92 or latest year*[a] *(per 1,000 population)*

Sex / Age group	NSW and ACT[b]	Vic	Qld	WA	SA and NT	Tas	Total
Males							
Less than 1	133.7	216.6	263.1	225.1	121.5	61.3	181.9
1–14	30.7	46.8	41.2	28.8	45.8	43.9	38.1
15–34	77.0	99.1	70.8	73.3	102.5	83.5	83.8
35–49	138.9	190.3	139.7	136.7	197.6	158.4	157.8
50–64	292.6	405.7	358.9	322.5	392.7	278.2	344.4
65–74	540.4	832.5	1,031.7	462.6	650.1	514.6	698.9
75 and over	890.4	1,464.0	2,068.9	735.6	1,406.8	842.1	1,268.3
All ages	169.4	246.2	243.0	153.2	233.4	173.3	205.9
Females							
Less than 1	96.9	182.2	230.3	239.3	98.2	31.4	153.3
1–14	28.8	40.6	34.2	25.4	37.6	32.3	33.3
15–34	199.7	311.7	276.3	306.0	344.4	160.3	264.4
35–49	249.1	374.8	317.1	330.2	416.8	341.7	318.7
50–64	313.6	459.4	446.4	369.4	494.6	376.7	395.9
65–74	485.0	762.0	899.7	499.4	840.4	563.4	658.6
75 and over	913.9	1,536.7	2,378.2	792.5	1,914.8	916.0	1,368.6
All ages	260.7	406.8	405.3	300.3	462.8	281.7	345.3
Persons	**215.9**	**328.3**	**323.9**	**227.5**	**349.7**	**228.8**	**276.6**

(a) Queensland 1990.

(b) Data presented for Vic, ACT and NT are estimated from the ABS Private Health Establishments collection published as ABS Cat. No. 4390.0 Private Hospitals Australia 1991–92.

Sources: Cook & Sardana 1994; AIHW unpublished data

Table S35: *Percentage of bed-days occupied by private and other patients in public acute and repatriation hospitals, by sex and age group, States and Territories, 1991–92 or latest year[a] (per cent)*

Sex / Age group	NSW	Vic	Qld	WA	SA	Tas	ACT	Total
Males								
Less than 1	30.1	29.6	10.1	20.0	30.4	23.0	66.2	25.8
1–14	35.8	29.4	11.0	24.0	25.3	23.4	34.2	26.1
15–34	27.9	28.5	5.2	22.6	21.2	23.7	35.8	21.3
35–49	33.3	27.1	11.2	23.3	25.5	21.7	42.3	25.3
50–64	35.8	28.2	12.8	24.4	22.6	21.6	46.6	27.1
65–74	46.6	45.2	30.4	32.2	33.4	53.7	50.9	41.0
75 and over	35.4	37.1	25.1	31.1	25.7	45.7	41.0	32.9
Unknown	100.0	7.1	100.0	–	0.6	–	–	8.9
All ages	36.6	34.3	17.4	27.1	26.7	36.2	45.6	30.4
Females								
Less than 1	30.7	28.3	10.3	20.5	31.6	34.2	67.5	25.9
1–14	34.2	28.8	10.3	22.8	23.0	18.1	42.2	24.9
15–34	34.9	28.9	15.7	16.7	21.1	21.8	54.2	26.6
35–49	38.5	32.9	15.3	22.4	27.2	18.3	52.9	29.9
50–64	36.0	28.4	13.6	21.4	20.4	19.5	42.9	27.1
65–74	30.7	30.9	18.0	19.8	18.6	27.3	45.0	26.5
75 and over	28.0	30.6	20.6	18.5	19.0	42.5	37.7	26.2
Unknown	100.0	29.0	–	100.0	7.6	–	–	20.8
All ages	32.6	30.1	16.5	19.4	21.0	29.2	48.9	26.8
Persons	**34.4**	**32.0**	**17.0**	**22.9**	**23.6**	**32.2**	**47.4**	**28.5**

(a) Queensland 1990. Data for NT unavailable.

Sources: Cook & Sardana 1994; AIHW unpublished data

Table S36: *Separations from public acute and DVA hospitals,*[(a)] *by 40 most frequently occurring procedures, States and Territories, 1991–92 or latest year (per 100,000 population)*

ICD-9-CM procedure	NSW 1991–92	Vic 1991–92	Qld 1990	WA 1991–92	SA 1991–92	Tas 1991–92	ACT 1991–92	NT 1990–91	Total
135 Other extracapsular extraction of lens	92	96	80	92	93	35	76	58	89
200 Myringotomy	67	81	55	84	137	39	88	67	76
231 Surgical removal of tooth	76	70	40	85	116	42	220	143	75
283 Tonsillectomy with adenoidectomy	50	47	50	56	73	23	42	37	51
332 Diagnostic procedures on lung and bronchus	81	70	69	59	94	113	77	33	75
372 Diagnostic procedures on heart and pericardium	140	63	10	181	130	85	310	–	102
399 Other operations on vessels	5	764	1,159	1,059	1,159	729	1,238	24	630
441 Diagnostic procedures on stomach	230	163	242	64	59	192	23	330	181
451 Diagnostic procedures on small intestine	277	295	129	419	567	367	774	43	304
452 Diagnostic procedures on other intestine	253	176	242	205	269	264	455	100	230
470 Appendectomy	126	107	96	120	101	83	91	110	112
512 Cholecystectomy	117	113	110	92	134	85	67	74	112
530 Unilateral repair of inguinal hernia	105	94	108	99	101	76	63	69	100
542 Diagnostic procedures of abdominal region	89	76	58	53	114	92	111	193	81
573 Diagnostic procedures on bladder	147	118	151	183	184	165	58	65	145
602 Transurethral prostatectomy	74	88	58	71	93	68	73	30	76
640 Circumcision	61	58	23	52	73	30	67	112	54
662 Bilateral endoscopic destruction or occlusion of fallopian tubes	62	59	17	92	80	59	78	84	58
673 Other excision or destruction of lesion or tissue of cervix	70	68	94	47	84	39	64	72	72
684 Total abdominal hysterectomy	71	64	71	72	66	55	70	55	69
690 Dilation and curettage of uterus	325	335	316	337	259	281	296	465	321
695 Aspiration curettage of uterus	98	140	4	80	317	112	122	394	114
730 Artificial rupture of membranes	158	159	74	55	51	125	410	228	129
736 Epesiotomy	123	86	138	86	68	113	195	192	109
741 Low cervical caesarean section	204	184	192	156	188	172	308	247	192
756 Repair of other current obstetric laceration	308	254	137	141	168	220	253	223	234

(Continued next page)

Table S36: *Separations from public acute and DVA hospitals,*[(a)] *by 40 most frequently occurring procedures, States and Territories, 1991–92 or latest year (per 100,000 population)* (continued)

ICD-9-CM procedure	NSW 1991–92	Vic 1991–92	Qld 1990	WA 1991–92	SA 1991–92	Tas 1991–92	ACT 1991–92	NT 1990–91	Total
786 Removal of internal fixation device	57	49	64	57	57	56	67	71	57
790 Closed reduction of fracture without internal fixation	149	107	104	116	133	102	85	169	124
793 Open reduction of fracture with internal fixation	109	116	93	122	114	101	127	191	111
802 Arthroscopy	47	55	63	37	121	38	48	77	57
815 Joint replacement of lower extremity	98	74	25	91	108	72	102	10	78
852 Excision or destruction of breast tissue	59	62	49	62	30	61	73	37	56
860 Incision of skin and subcutaneous tissue	60	34	76	73	72	44	18	269	59
862 Excision or destruction of lesion or tissue of skin and subcutaneous tissue	85	74	64	75	98	70	55	117	78
863 Other local excision or destruction of lesion or tissue of skin and subcutaneous tissue	197	168	305	162	208	140	210	106	203
865 Suture of skin and subcutaneous tissue	33	40	117	49	79	35	6	75	54
870 Soft tissue X-ray of face, head and neck	17	108	105	159	234	133	26	151	91
884 Arteriography using contrast material	38	50	38	63	81	83	108	20	49
990 Transfusion of blood and blood components	41	131	66	149	240	179	20	16	98
992 Injection or infusion of other therapeutic or prophylactic substance	50	507	227	742	549	346	817	5	326
Total	**4,451**	**5,400**	**5,118**	**5,995**	**6,904**	**5,127**	**7,390**	**4,761**	**5,231**

(a) Department of Veterans' Affairs (DVA) hospital data for 1991–92 is included for NSW, Vic, Qld, WA, SA and Tas only.

Sources: Cook & Sardana 1994; AIHW unpublished data

Table S37: *Occupied bed-days in public acute and DVA hospitals,*[(a)] *by 40 most frequently occurring procedures, States and Territories, 1991–92 or latest year (per 1,000 population)*

ICD-9-CM procedure	NSW 1991–92	Vic 1991–92	Qld 1990	WA 1991–92	SA 1991–92	Tas 1991–92	ACT 1991–92	NT 1990–91	Total
135 Other extracapsular extraction of lens	2.3	1.9	2.1	2.3	2.0	1.1	1.9	3.3	2.1
200 Myringotomy	0.8	0.9	0.7	0.9	1.6	0.5	1.0	0.8	0.9
231 Surgical removal of tooth	0.9	0.8	0.9	1.0	1.7	0.5	2.3	1.6	1.0
283 Tonsillectomy with adenoidectomy	1.2	0.9	0.8	1.0	1.4	0.6	0.5	0.5	1.0
332 Diagnostic procedures on lung and bronchus	4.3	5.0	5.6	4.3	6.5	5.4	5.0	2.7	4.9
372 Diagnostic procedures on heart and pericardium	4.6	2.6	0.5	6.5	5.0	2.3	11.9	–	3.6
399 Other operations on vessels	0.4	8.6	12.6	11.1	13.1	7.8	14.7	1.7	7.1
441 Diagnostic procedures on stomach	7.7	5.9	8.0	1.4	1.3	5.2	0.6	8.4	6.0
451 Diagnostic procedures on small intestine	10.1	10.2	5.4	12.4	17.3	9.1	22.6	0.8	10.2
452 Diagnostic procedures on other intestine	6.4	4.4	5.7	5.0	6.1	5.0	10.0	4.7	5.6
470 Appendectomy	5.6	4.6	4.1	4.9	4.4	3.8	4.4	5.8	4.9
512 Cholecystectomy	9.2	7.8	9.0	7.1	9.1	6.4	5.8	6.9	8.5
530 Unilateral repair of inguinal hernia	4.3	3.4	3.9	3.6	4.4	3.0	2.1	4.8	3.9
542 Diagnostic procedures of abdominal region	1.8	1.4	1.4	1.1	2.6	1.6	1.7	3.4	1.7
573 Diagnostic procedures on bladder	4.5	2.9	5.3	4.4	4.8	4.5	2.9	2.6	4.2
602 Transurethral prostatectomy	6.5	7.4	5.0	5.4	7.2	6.3	10.0	3.4	6.5
640 Circumcision	0.9	0.7	0.4	0.9	0.9	0.5	2.9	5.5	0.8
662 Bilateral endoscopic destruction or occlusion of fallopian tubes	0.7	0.8	0.3	1.1	1.0	0.7	0.8	1.6	0.7
673 Other excision or destruction of lesion or tissue of cervix	0.8	0.8	1.2	0.5	1.1	0.4	0.7	0.8	0.8
684 Total abdominal hysterectomy	5.8	5.5	5.5	5.7	5.1	5.4	6.6	4.7	5.6
690 Dilation and curettage of uterus	4.2	4.5	5.3	4.4	3.7	4.0	3.7	9.1	4.5
695 Aspiration curettage of uterus	1.1	1.5	0.1	0.9	3.6	1.4	1.6	4.3	1.3
730 Artificial rupture of membranes	6.9	8.7	3.5	2.4	2.7	6.4	19.5	11.8	6.3
736 Epesiotomy	5.8	4.6	6.9	4.2	3.2	5.6	8.9	11.1	5.4
741 Low cervical caesarean section	17.1	16.5	15.2	12.8	15.7	15.0	24.8	26.3	16.2
756 Repair of other current obstetric laceration	13.5	12.8	6.6	6.5	7.5	10.6	11.0	11.0	10.9

(Continued next page)

Table S37: *Occupied bed-days in public acute and DVA hospitals,*[a] *by 40 most frequently occurring procedures, States and Territories, 1991–92 or latest year (per 1,000 population)* (continued)

ICD-9-CM procedure	NSW 1991–92	Vic 1991–92	Qld 1990	WA 1991–92	SA 1991–92	Tas 1991–92	ACT 1991–92	NT 1990–91	Total
786 Removal of internal fixation device	1.9	1.4	2.2	2.4	1.7	1.4	1.7	2.0	1.9
790 Closed reduction of fracture without internal fixation	4.2	3.4	3.3	3.4	3.5	5.0	2.6	9.6	3.7
793 Open reduction of fracture with internal fixation	12.3	14.5	11.8	11.1	9.8	13.8	13.6	26.5	12.6
802 Arthroscopy	1.1	1.0	1.3	0.8	2.3	0.9	1.2	2.6	1.2
815 Joint replacement of lower extremity	17.7	13.1	4.3	16.3	14.2	14.7	16.6	2.9	13.7
852 Excision or destruction of breast tissue	1.4	1.3	1.5	1.5	0.9	1.6	1.3	0.7	1.3
860 Incision of skin and subcutaneous tissue	2.9	1.7	3.6	3.2	3.3	2.4	0.9	19.4	2.9
862 Excision or destruction of lesion or tissue of skin and subcutaneous tissue	5.3	5.1	4.2	4.5	6.8	4.4	5.6	13.4	5.2
863 Other local excision or destruction of lesion or tissue of skin and subcutaneous tissue	5.3	3.8	8.0	3.6	7.3	3.7	3.3	2.7	5.3
865 Suture of skin and subcutaneous tissue	1.1	1.2	2.9	1.5	2.1	1.6	0.2	3.1	1.6
870 Soft tissue X-ray of face, head and neck	0.8	13.7	15.6	25.0	25.4	19.5	1.0	15.7	11.6
884 Arteriography using contrast material	1.7	2.4	1.8	2.7	3.3	2.4	6.7	0.5	2.2
990 Transfusion of blood and blood components	1.9	5.9	4.3	9.2	7.3	7.0	0.7	2.0	4.6
992 Injection or infusion of other therapeutic or prophylactic substance	1.2	9.7	5.2	17.0	12.7	8.0	13.0	0.1	6.9
Total	**186.1**	**203.8**	**185.8**	**214.1**	**233.8**	**199.4**	**246.5**	**238.8**	**199.2**

(a) Department of Veterans' Affairs (DVA) hospital data for 1991–92 is included for NSW, Vic, Qld, WA, SA and Tas only.

Sources: Cook & Sardana 1994; AIHW unpublished data

Table S38: *Separations from public acute and DVA hospitals,*(a) *by 40 most frequently occurring diagnoses, States and Territories, 1991–92 or latest year (per 1,000 population)*

ICD-9-CM diagnosis	NSW 1991–92	Vic 1991–92	Qld 1990	WA 1991–92	SA 1991–92	Tas 1991–92	ACT 1991–92	NT 1990–91	Total
173 Other malignant neoplasm of skin	92	85	147	108	100	76	115	43	101
250 Diabetes mellitus	89	86	88	78	122	88	73	128	90
345 Epilepsy	96	69	90	101	88	60	52	111	86
366 Cataract	133	147	139	150	135	41	108	67	136
410 Acute myocardial infarction	182	150	160	155	188	171	116	79	166
411 Other acute and subacute forms of ischaemic heart disease	146	112	38	111	91	172	131	22	111
413 Angina pectoris	79	62	150	88	125	59	48	64	90
414 Other forms of chronic ischaemic heart disease	246	159	133	193	266	200	199	18	197
427 Cardiac dysrhythmias	137	104	106	109	128	113	87	71	118
428 Heart failure	192	165	185	177	240	157	111	96	183
474 Chronic disease of tonsils and adenoids	96	100	103	120	137	65	98	72	103
493 Asthma	356	250	359	420	480	192	233	324	339
496 Chronic airway obstruction, not elsewhere classified	130	95	116	83	126	105	49	99	111
530 Diseases of oesophagus	187	146	140	150	279	219	282	94	174
535 Gastritis and duodenitis	101	74	72	107	83	101	145	111	89
550 Inguinal hernia	125	116	126	117	129	88	91	76	120
558 Other non-infectious gastroenteritis and colitis	172	94	131	156	162	124	112	54	139
574 Cholelithiasis	159	139	119	125	170	113	140	86	142
599 Other disorders of urethra and urinary tract	104	84	118	122	122	107	49	149	104
626 Disorders of menstruation and other abnormal bleeding from female genital tract	119	127	119	144	156	134	114	148	127
634 Spontaneous abortion	121	86	100	103	72	75	129	171	102
635 Legally induced abortion	53	106	3	72	278	83	73	386	83
642 Hypertension complicating pregnancy, childbirth and the puerperium	109	88	90	94	101	101	106	141	98
644 Early or threatened labour	117	126	127	101	109	144	151	185	121

(Continued next page)

Table S38: *Separations from public acute and DVA hospitals,*[(a)] *by 40 most frequently occurring diagnoses, States and Territories, 1991–92 or latest year (per 100,000 population) (continued)*

ICD-9-CM procedure	**NSW 1991–92**	**Vic 1991–92**	**Qld 1990**	**WA 1991–92**	**SA 1991–92**	**Tas 1991–92**	**ACT 1991–92**	**NT 1990–91**	**Total**
650 Delivery in a completely normal case	263	142	518	246	181	200	266	500	266
656 Other foetal and placental problems affecting management of mother	170	157	92	123	158	115	125	142	145
664 Trauma to perineum and vulva during delivery	268	251	139	140	192	274	271	260	224
682 Other cellulitis and abscess	93	66	109	105	86	53	45	366	90
715 Osteoarthrosis and allied disorders	103	75	78	116	123	77	111	22	93
724 Other and unspecified disorders of back	103	82	167	173	201	84	78	75	122
780 General symptoms	186	123	210	193	261	131	115	196	178
786 Symptoms involving respiratory system and other chest symptoms	204	134	243	181	277	152	162	144	194
789 Other symptoms involving abdomen and pelvis	257	209	443	289	320	209	205	266	282
813 Fracture of radius and ulna	133	91	105	130	131	80	78	192	115
854 Intracranial injury of other and unspecified nature	81	49	192	74	69	59	40	133	89
996 Complications peculiar to certain specified procedures	96	78	60	116	128	63	87	32	88
V25 Contraceptive management	128	131	65	170	169	108	94	120	125
V56 Aftercare involving intermittent dialysis	1,026	1,035	1,150	1,050	1,155	723	1,232	–	1,048
V58 Other and unspecified aftercare	415	402	272	661	469	393	783	36	418
V67 Follow-up examination	78	21	70	325	127	64	61	31	89
Total	**6,943**	**5,814**	**6,869**	**7,276**	**7,932**	**5,577**	**6,566**	**5,310**	**6,697**

(a) Department of Veterans' Affairs (DVA) hospital data for 1991–92 is included for NSW, Vic, Qld, WA, SA and Tas only.

Sources: Cook & Sardana 1994; AIHW unpublished data

Table S39: *Occupied bed-days in public acute and DVA hospitals,*[(a)] *by 40 most frequently occurring diagnoses, States and Territories, 1991–92 or latest year (per 1,000 population)*

ICD-9-CM diagnosis	NSW 1991–92	Vic 1991–92	Qld 1990	WA 1991–92	SA 1991–92	Tas 1991–92	ACT 1991–92	NT 1990–91	Total
173 Other malignant neoplasm of skin	3.6	3.0	5.1	3.7	3.9	3.5	1.8	0.9	3.7
250 Diabetes mellitus	8.0	8.3	7.6	6.9	10.9	10.6	11.1	11.9	8.3
345 Epilepsy	3.5	3.4	4.1	4.1	4.6	4.6	2.4	6.2	3.7
366 Cataract	3.0	3.0	3.7	3.8	3.1	1.2	1.8	3.4	3.1
410 Acute myocardial infarction	15.4	12.4	14.5	12.6	15.3	14.0	10.1	5.9	14.0
411 Other acute and subacute forms of ischaemic heart disease	8.5	5.9	2.4	5.8	5.2	9.2	7.4	0.8	6.2
413 Angina pectoris	3.2	2.4	6.9	3.6	5.2	2.4	2.6	2.7	3.8
414 Other forms of chronic ischaemic heart disease	15.5	9.8	9.8	9.8	15.1	10.1	6.8	0.9	12.1
427 Cardiac dysrhythmias	6.7	4.9	5.4	4.6	5.9	5.4	3.9	3.6	5.6
428 Heart failure	19.7	17.1	19.7	18.5	23.6	16.3	12.3	9.3	18.9
474 Chronic disease of tonsils and adenoids	2.2	2.0	1.7	2.4	2.7	1.6	1.3	1.0	2.1
493 Asthma	12.3	7.9	11.5	12.8	17.2	8.2	8.5	11.7	11.3
496 Chronic airway obstruction, not elsewhere classified	12.7	9.7	12.3	9.1	11.9	10.8	5.3	8.8	11.2
530 Diseases of oesophagus	4.7	4.0	3.7	3.4	6.5	4.7	5.9	1.6	4.4
535 Gastritis and duodenitis	2.2	1.6	1.7	2.3	1.7	1.9	2.1	2.1	1.9
550 Inguinal hernia	4.9	4.1	4.1	4.2	5.0	3.4	2.6	2.6	4.4
558 Other non-infectious gastroenteritis and colitis	4.6	2.8	4.1	5.5	4.8	3.5	2.9	2.6	4.1
574 Cholelithiasis	9.5	7.9	7.5	8.1	9.4	6.9	9.0	5.9	8.5
599 Other disorders of urethra and urinary tract	5.1	4.7	6.3	5.6	5.6	5.3	2.8	12.7	5.3
626 Disorders of menstruation and other abnormal bleeding from female genital tract	2.3	2.2	3.3	3.6	4.0	2.9	2.6	3.3	2.7
634 Spontaneous abortion	1.6	1.1	1.5	1.4	0.9	1.1	1.6	3.7	1.4
635 Legally induced abortion	0.6	1.1	0.1	0.9	3.2	1.0	0.8	4.2	0.9
642 Hypertension complicating pregnancy, childbirth and the puerperium	6.5	5.2	4.5	5.1	5.7	5.7	7.5	10.8	5.7
644 Early or threatened labour	4.0	3.6	2.9	2.7	3.3	3.5	5.4	9.0	3.6

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Table S39: *Occupied bed-days in public acute and DVA hospitals,*[a] *by 40 most frequently occurring diagnoses, States and Territories, 1991–92 or latest year (per 1,000 population)* (continued)

ICD-9-CM procedure	NSW 1991–92	Vic 1991–92	Qld 1990	WA 1991–92	SA 1991–92	Tas 1991–92	ACT 1991–92	NT 1990–91	Total
650 Delivery in a completely normal case	10.2	6.4	22.7	10.6	8.3	8.4	10.0	27.1	11.3
656 Other foetal and placental problems affecting management of mother	8.9	8.8	4.6	7.0	8.4	6.1	7.3	9.0	7.8
664 Trauma to perineum and vulva during delivery	11.2	12.4	6.4	6.4	8.6	12.8	12.3	12.9	10.1
682 Other cellulitis and abscess	6.4	4.8	6.5	6.5	4.9	3.5	2.7	24.8	5.9
715 Osteoarthrosis and allied disorders	12.3	8.8	9.4	14.1	12.8	11.6	12.3	3.9	11.0
724 Other and unspecified disorders of back	6.3	4.6	10.7	8.0	9.6	5.4	3.9	3.7	7.0
780 General symptoms	5.6	3.9	6.8	5.7	8.7	5.3	4.0	7.9	5.6
786 Symptoms involving respiratory system and other chest symptoms	5.8	3.6	7.6	5.2	8.7	4.2	4.4	6.3	5.6
789 Other symptoms involving abdomen and pelvis	6.3	4.6	10.7	7.4	8.4	4.9	5.1	8.1	6.8
813 Fracture of radius and ulna	3.0	2.3	3.2	3.3	3.2	2.9	1.9	9.3	2.9
854 Intracranial injury of other and unspecified nature	1.8	1.2	4.2	1.3	1.8	1.3	2.6	6.3	2.0
996 Complications peculiar to certain specified procedures	10.8	8.1	7.4	13.8	11.7	6.4	10.2	2.3	9.7
V25 Contraceptive management	1.5	1.5	1.1	2.0	2.2	1.3	1.0	2.1	1.5
V56 Aftercare involving intermittent dialysis	10.4	10.9	11.8	10.6	11.6	7.4	12.4	–	10.7
V58 Other and unspecified aftercare	7.3	6.5	4.9	11.6	8.9	8.0	12.1	1.3	7.3
V67 Follow-up examination	1.4	0.6	1.3	3.5	2.0	2.6	1.4	2.3	1.5
Total	**269.3**	**217.2**	**263.7**	**257.3**	**294.5**	**230.1**	**220.0**	**252.8**	**253.9**

(a) Department of Veterans' Affairs (DVA) hospital data for 1991–92 is included for NSW, Vic, Qld, WA, SA and Tas only.

Sources: Cook & Sardana 1994; AIHW unpublished data

Nursing homes

Table S40: *Nursing home residents*[a] *and proportion of population resident, by age and sex, States and Territories, 30 June 1993 (number)*

Age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust	% of pop'n
Females										
Less than 50	203	86	71	42	73	12	4	6	497	0.01
50–54	103	48	40	23	23	12	5	1	255	0.06
55–59	201	79	64	34	42	12	4	7	443	0.12
60–64	355	174	125	77	74	30	9	1	845	0.24
65–69	737	367	297	146	180	45	12	5	1,789	0.50
70–74	1,536	724	577	243	322	88	30	15	3,535	1.16
75–79	2,932	1,655	1,187	564	690	237	54	11	7,330	3.17
80–84	4,717	2,565	1,902	958	1,096	370	91	22	11,721	7.42
85–89	4,958	2,969	2,070	1,067	1,176	356	88	17	12,701	15.33
90–94	3,408	2,122	1,503	758	848	257	60	12	8,968	28.56
95–99	1,198	799	540	218	349	72	19	2	3,197	42.16
100 and over	274	202	109	42	88	17	4	2	738	55.95
Total	*20,622*	*11,790*	*8,485*	*4,172*	*4,961*	*1,508*	*380*	*101*	*52,019*	*0.59*
Males										
Less than 50	207	69	74	77	78	17	4	11	537	0.01
50–54	84	66	29	24	22	7	2	2	236	0.05
55–59	233	73	61	35	40	9	4	3	458	0.12
60–64	397	181	159	80	63	18	2	6	906	0.25
65–69	759	377	279	140	156	39	19	6	1,775	0.54
70–74	1,034	515	425	206	262	78	21	11	2,552	1.02
75–79	1,536	909	626	305	347	125	22	7	3,877	2.37
80–84	1,651	1,006	714	374	409	108	33	16	4,311	4.61
85–89	1,262	792	566	322	300	92	25	6	3,365	8.66
90–94	550	351	270	133	150	52	9	5	1,520	13.84
95–99	145	114	71	24	44	12	2	–	412	25.15
100 and over	36	36	16	6	12	4	–	–	110	37.04
Total	*7,894*	*4,489*	*3,290*	*1,726*	*1,883*	*561*	*143*	*73*	*20,059*	*0.23*
All persons	**28,516**	**16,279**	**11,775**	**5,898**	**6,844**	**2,069**	**523**	**174**	**72,078**	**0.41**

(a) Excludes homes not specifically catering for aged persons.

Sources: DHHLGCS 1993a; AIHW unpublished data

Table S41: *Nursing home separations by length of stay, States and Territories, 1991–92 (per cent)*

Duration	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Less than 4 weeks	28.0	32.8	17.1	23.7	30.3	26.2	15.3	22.7	27.7
4 to 7 weeks	11.9	10.4	8.2	8.1	10.3	10.0	7.6	12.5	10.5
8 to 12 weeks	5.8	5.4	4.9	4.7	6.1	4.9	3.8	4.5	5.5
13 to 25 weeks	8.0	7.2	7.9	7.8	7.7	7.2	8.6	13.6	7.7
26 to 38 weeks	4.1	3.7	4.8	5.0	4.0	5.6	4.3	1.1	4.2
39 to 51 weeks	4.1	3.7	4.8	5.0	4.0	5.6	4.3	3.4	4.2
1 to < 2 years	11.1	10.2	14.7	11.5	10.3	10.7	15.8	10.2	11.3
2 to < 3 years	7.3	7.9	9.8	9.4	7.1	9.5	17.3	3.4	8.0
3 to < 4 years	5.0	5.0	7.0	6.2	5.5	5.9	6.2	11.3	5.4
4 to < 5 years	3.7	3.6	5.3	4.2	3.4	4.1	7.6	2.2	3.9
5 to < 10 years	7.7	6.6	11.0	10.0	7.8	7.8	6.2	13.6	8.0
10 or more years	2.0	1.6	2.6	2.9	2.3	1.6	–	1.1	2.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Separations	*15,469*	*10,127*	*4,793*	*2,773*	*4,102*	*1,196*	*208*	*88*	*38,756*

Source: DHHLGCS 1993b

Health expenditure

Table S42: *Total health expenditure (current and constant 1989–90 prices) and rate of growth, 1982–83 to 1992–93*

	Total health expenditure ($m)		Annual rate of growth (%)	
Year	Current prices	Constant 1989–90 prices[a]	Current prices	Constant 1989–90 prices[a]
1982–83	13,239	20,673		
1983–84	14,958	21,989	13.0	6.4
1984–85	16,546	22,862	10.6	4.0
1985–86	18,586	24,180	12.3	5.8
1986–87	21,115	25,341	13.6	4.8
1987–88	23,328	26,294	10.5	3.8
1988–89	26,154	27,748	12.1	5.5
1989–90	28,814	28,814	10.2	3.8
1990–91	31,132	29,358	8.0	1.9
1991–92[b]	32,758	30.020	5.2	2.3
1992–93[b]	34,338	31,068	4.8	3.5

(a) Health expenditure 1982–83 to 1992–93 deflated to constant prices using specific health deflators.

(b) Based on preliminary AIHW and ABS estimates.

Source: AIHW unpublished data

Table S43: *Total, recurrent and capital health expenditure (current and constant 1989–90 prices), 1975–76 to 1992–93 ($ million)*

Year	Recurrent expenditure	Government capital consumption	Capital expenditure	Total expenditure
Current prices				
1975–76	5,092	114	513	5,719
1976–77	5,901	150	552	6,603
1977–78	6,762	176	531	7,469
1978–79	7,462	200	579	8,240
1979–80	8,297	241	540	9,078
1980–81	9,457	268	499	10,224
1981–82	11,049	303	446	11,798
1982–83	12,434	341	464	13,239
1983–84	13,996	358	604	14,958
1984–85	15,397	380	769	16,546
1985–86	17,172	416	998	18,586
1986–87	19,528	454	1,133	21,115
1987–88	21,569	476	1,282	23,328
1988–89	24,302	487	1,365	26,154
1989–90	26,849	510	1,456	28,814
1990–91	29,162	521	1,449	31,132
1991–92(a)	30,879	536	1,343	32,758
1992–93(a)	32,379	543	1,416	34,338
Constant 1989–90 prices(b)				
1975–76	15,706	350	1,623	17,679
1976–77	16,017	417	1,587	18,021
1977–78	16,979	450	1,412	18,841
1978–79	17,589	479	1,449	19,517
1979–80	17,769	515	1,219	19,502
1980–81	18,182	510	1,007	19,699
1981–82	19,087	511	795	20,393
1982–83	19,439	506	728	20,673
1983–84	20,603	499	887	21,989
1984–85	21,271	507	1,084	22,862
1985–86	22,396	509	1,274	24,180
1986–87	23,490	522	1,329	25,341
1987–88	24,335	525	1,434	26,294
1988–89	25,796	513	1,440	27,748
1989–90	26,849	510	1,456	28,814
1990–91	27,425	510	1,423	29,358
1991–92(a)	28,298	491	1,231	30,020
1992–93(a)	27	491	1,281	31,068

(a) Based on preliminary AIHW and ABS estimates.

(b) Health expenditure 1975–76 to 1992–93 deflated to constant prices using specific health deflators.

Source: AIHW unpublished data

Table S44: *Total health expenditure, GDP and rate of growth (current prices), 1982–83 to 1992–93*

	Total health expenditure		GDP		
Year	Amount ($m)	Growth rate (%)	Amount ($m)	Growth rate (%)	Health expenditure as % of GDP
1982–83	13,239		171,774		7.7
1983–84	14,958	13.0	194,831	13.4	7.7
1984–85	16,546	10.6	216,257	11.0	7.7
1985–86	18,586	12.3	240,224	11.1	7.7
1986–87	21,115	13.6	264,521	10.1	8.0
1987–88	23,328	10.5	298,426	12.8	7.8
1988–89	26,154	12.1	339,723	13.8	7.7
1989–90	28,814	10.2	370,007	8.9	7.8
1990–91	31,132	8.0	379,902	2.7	8.2
1991–92(a)	32,758	5.2	388,071	2.2	8.4
1992–93(a)	34,338	4.8	401,698	3.5	8.5

(a) Total health expenditure figures are based on preliminary AIHW and ABS estimates.

Sources: AIHW unpublished data; ABS Cat. No. 5206.0

Table S45: *Health expenditure per person (current and constant 1989–90 prices) and rate of growth, 1982–83 to 1992–93*

	Expenditure per person ($)		Rate of growth (%)	
Year	Current prices	Constant 1989–90 prices(a)	Current prices	Constant 1989–90 prices
1982–83	866	1,352		
1983–84	966	1,420	11.6	5.0
1984–85	1,055	1,458	9.2	2.7
1985–86	1,169	1,521	10.8	4.3
1986–87	1,309	1,571	12.0	3.3
1987–88	1,424	1,605	8.8	2.2
1988–89	1,569	1,664	10.2	3.7
1989–90	1,703	1,703	8.5	2.3
1990–91	1,813	1,710	6.5	0.4
1991–92(b)	1,881	1,724	3.7	0.8
1992–93(b)	1,944	1,768	3.9	2.6

(a) Health expenditure 1982–83 to 1992–93 deflated to constant prices using specific health deflators.

(b) Based on preliminary AIHW and ABS estimates.

Sources: AIHW unpublished data; ABS Cat. No. 3101.0

Table S46: *Total health expenditure (current prices), 1980–81, 1985–86 and 1990–91 ($ million)*

Health expenditure	1980–81	1985–86	1990–91
Recurrent health expenditure			
Institutional			
Hospitals			
Recognised public	3,365	5,518	8,726
Repatriation	164	266	516
Private	454	969	1,821
Public psychiatric	465	619	780
Total hospitals	4,448	7,372	11,843
Total nursing homes	788	1,546	2,550
Other institutional services	175	304	465
Total institutional	5,412	9,221	14,857
Non-institutional			
Medical services	1,607	3,091	5,499
Dental services	430	879	1,501
Other professional services	241	572	1,202
Community and public health	282	689	1,153
Pharmaceuticals	810	1,491	2,803
Other non-institutional[(a)]	675	1,229	2,147
Total non-institutional	4,045	7,951	14,305
Total recurrent health expenditure[(b)]	**9,457**	**17,172**	**29,162**
Capital health expenditure	**499**	**998**	**1,449**
Capital consumption	**268**	**416**	**521**
Total health expenditure	**10,224**	**18,586**	**31,132**

(a) Includes aids and appliances, research, administration and other non-institutional services.

(b) Does not include capital consumption.

Source: AIHW unpublished data

Table S47: *Total health expenditure (constant 1989–90 prices), 1980–81, 1985–86 and 1990–91 ($ million)*

Health expenditure	1980–81	1985–86	1990–91
Recurrent health expenditure			
Institutional			
Hospitals			
Recognised public	6,478	7,166	8,246
Repatriation	316	346	487
Private	874	1,258	1,720
Public psychiatric	896	804	737
Total hospitals	8,564	9,575	11,191
Total nursing homes	1,518	2,008	2,410
Other institutional services	338	394	439
Total institutional	10,420	11,977	14,040
Non-institutional			
Medical services	3,143	4,099	5,107
Dental services	995	1,284	1,390
Other professional services	460	741	1,136
Community and public health	507	840	1,099
Pharmaceuticals	1,442	1,930	2,620
Other non-institutional(a)	1,215	1,526	2,035
Total non-institutional	7,762	10,420	13,385
Total recurrent health expenditure(b)	**18,182**	**22,396**	**27,425**
Capital health expenditure	**1,007**	**1,274**	**1,423**
Capital consumption	**510**	**509**	**510**
Total health expenditure	**19,699**	**24,180**	**29,358**

(a) Includes aids and appliances, research, administration and other non-institutional services.

(b) Does not include capital consumption.

Source: AIHW unpublished data

Table S48: *Total health expenditure (constant 1989–90 prices),*[a] *by source of funds, 1970–71 to 1992–93 ($ million)*

	Public sector				
Year	Commonwealth government	State and local government	Total government	Private sector	All sectors
1970–71	3,262	3,340	6,602	5,043	11,644
1971–72	3,658	3,521	7,179	5,157	12,336
1972–73	3,866	3,717	7,583	5,393	12,977
1973–74	4,039	4,152	8,191	5,299	13,489
1974–75	4,436	5,120	9,556	5,680	15,237
1975–76	8,301	4,457	12,758	4,921	17,679
1976–77	7,403	4,522	11,926	6,095	18,021
1977–78	6,798	4,801	11,599	7,243	18,841
1978–79	6,872	5,233	12,105	7,412	19,517
1979–80	6,747	5,180	11,927	7,575	19,502
1980–81	6,957	5,318	12,276	7,424	19,699
1981–82	7,068	5,530	12,597	7,795	20,393
1982–83	6,972	5,467	12,439	8,234	20,673
1983–84	8,353	5,705	14,058	7,931	21,989
1984–85	10,454	5,797	16,250	6,611	22,862
1985–86	11,030	6,147	17,177	7,003	24,180
1986–87	11,253	6,557	17,810	7,531	25,341
1987–88	11,544	6,799	18,343	7,951	26,294
1988–89	11,804	7,305	19,109	8,639	27,748
1989–90	12,104	7,635	19,739	9,076	28,814
1990–91	12,422	7,603	20,024	9,333	29,358
1991–92(b)	12,957	7,313	20,270	9,749	30,020
1992–93(b)	13,704	7,288	20,992	10,077	31,068

(a) Health expenditure 1970–71 to 1992–93 deflated to constant prices using specific health deflators.

(b) Based on preliminary AIHW and ABS estimates.

Source: AIHW unpublished data

Table S49: *Total health expenditure by area of expenditure and source of funds,*[(a)] *1990–91 ($ million)*

	Public sector			Private sector					
Area of expenditure	**Commonwealth**	**State/ local**	**Total**	**Health insurance funds**	**Individuals**	[(b)] **Other**	**Total**	**Total**	**Per cent**
Total health expenditure	**13,219**	**7,992**	**21,211**	**na**	**na**	**na**	**9,921**	**31,132**	
Capital expenditure	**181**	**775**	**956**	**na**	**na**	[(c)]	**493**	**1,449**	
Capital consumption	**47**	**474**	**521**	[(d)]	[(d)]	[(d)]	[(d)]	**521**	
Total recurrent expenditure	**12,991**	**6,743**	**19,734**	**3,491**	**5,096**	**841**	**9,428**	**29,162**	**100.0**
Total institutional	**6,070**	**5,526**	**11,596**	**2,075**	**858**	**328**	**3,262**	**14,857**	**50.9**
Total hospitals	4,307	5,012	9,319	2,012	207	305	2,524	11,843	40.6
Recognised public	3,711	4,301	8,012	550	–	164	714	8,726	29.9
Private	86	–	86	1,451	152	132	1,734	1,821	6.2
Repatriation	494	3	497	11	–	8	19	516	1.8
Public psychiatric	17	707	724	–	55	1	56	780	2.7
Total nursing homes[(e)]	1,658	325	1,983	–	562	5	567	2,550	8.7
Other institutional services	105	189	294	63	89	19	171	465	1.6
Ambulance	38	189	227	63	89	19	171	398	1.4
Other institutional (nec)	67	–	67	–	–	–	–	67	0.2
Total non-institutional	**6,921**	**1,218**	**8,138**	**1,416**	**4,238**	**513**	**6,166**	**14,305**	**49.1**
Medical services	4,384	8	4,392	173	636	297	1,107	5,499	18.9
Dental services	33	62	95	503	887	16	1,406	1,501	5.1
Other professional services	138	–	138	156	749	159	1,064	1,202	4.1
Community and public health[(f)]	293	844	1,138	1	–	14	15	1,153	4.0

Continued next page

Table S49: *Total health expenditure by area of expenditure and source of funds, 1990–91 ($ million)* (continued)

	Public sector			Private sector					
Area of expenditure	**Common-wealth**	**State/ local**	**Total**	**Health insurance funds**	**Indiv-iduals**	**Other**	**Total**	**Total**	**Per cent**
Total non-institutional (continued)									
Total pharmaceuticals	1,245	–	1,245	39	1,506	13	1,558	2,803	9.6
Benefit paid items	1,245	–	1,245	–	224	–	224	1,468	5.0
All other items	–	–	–	39	1,282	13	1,335	1,335	4.6
Aids and appliances	60	2	62	153	407	13	573	635	2.2
Administration	470	126	596	391	–	–	391	986	3.4
Research	279	98	378	–	53	–	53	431	1.5
Other non-institutional	17	77	94	–	–	–	–	94	0.3

(a) This table records the amounts provided by the Commonwealth, State and local governments and the private sector to fund expenditure on health. It does not give the actual amount spent directly on health goods and services by each sector.

(b) The 'Other' column includes the health costs paid by workers' compensation and motor vehicle third party insurance funds.

(c) Capital expenditure for the private sector cannot be broken down by source of funds.

(d) Capital consumption (depreciation) for the private sector is included in recurrent expenditure.

(e) Nursing home expenditure for 1987–88 to 1990–91 is not comparable with earlier years because from 1987–88 non-aged nursing homes expenditure was not included and the methodology for calculating individual contributions changed.

(f) This includes the old categories of community health services and health promotion and illness prevention.

Source: AIHW unpublished data

Table S50: *Total health expenditure as a percentage of GDP, Australia and selected OECD countries, 1970 to 1992 (per cent)*

Year	Aust[a]	Can	Fra	Ger[b]	Jpn	NZ	Swe	UK	USA	Nine country mean[c]	Eight country mean[d]
1970	5.2	7.1	5.8	5.9	4.6	5.2	7.2	4.5	7.4	5.9	5.7
1971	5.7	7.4	6.0	6.3	4.7	5.2	7.5	4.6	7.5	6.1	5.9
1972	5.9	7.2	6.1	6.5	4.8	5.3	7.5	4.7	7.6	6.2	6.0
1973	5.8	7.0	6.2	6.8	4.7	5.5	7.4	4.6	7.6	6.2	6.0
1974	5.9	6.8	6.3	7.4	5.1	6.1	7.6	5.3	7.9	6.5	6.3
1975	6.5	7.2	7.0	8.1	5.6	6.7	7.9	5.5	8.4	7.0	6.8
1976	7.5	7.2	7.0	8.1	5.6	6.3	8.2	5.5	8.6	7.1	6.9
1977	7.5	7.2	7.0	8.1	5.8	6.6	9.1	5.3	8.7	7.3	7.1
1978	7.8	7.2	7.3	8.1	6.0	7.1	9.2	5.3	8.7	7.4	7.2
1979	7.6	7.1	7.4	8.1	6.1	7.0	9.0	5.3	8.7	7.4	7.2
1980	7.4	7.4	7.6	8.4	6.6	7.2	9.4	5.8	9.2	7.7	7.5
1981	7.3	7.5	7.9	8.7	6.6	6.9	9.5	6.1	9.6	7.8	7.6
1982	7.5	8.4	8.0	8.6	6.8	6.6	9.7	5.9	10.3	8.0	7.7
1983	7.7	8.6	8.2	8.5	6.9	6.5	9.6	6.1	10.6	8.1	7.8
1984	7.7	8.5	8.5	8.7	6.7	6.1	9.4	6.1	10.4	8.0	7.7
1985	7.7	8.5	8.5	8.7	6.5	6.5	8.8	6.0	10.5	8.0	7.6
1986	7.7	8.8	8.5	8.7	6.6	6.7	8.5	6.1	10.8	8.0	7.7
1987	8.0	8.9	8.5	8.7	6.7	7.0	8.6	6.1	11.0	8.2	7.8
1988	7.8	8.8	8.6	8.8	6.6	7.1	8.6	6.1	11.3	8.2	7.8
1989	7.7	9.0	8.7	8.3	6.6	7.1	8.6	6.1	11.6	8.2	7.8
1990	7.8	9.5	8.8	8.3	6.5	7.2	8.6	6.2	12.4	8.4	7.9
1991	8.2	10.0	9.1	8.5	6.6	7.6	8.6	6.6	13.4	8.7	8.2
1992	8.5								14.0		
Average	**7.2**	**8.0**	**7.6**	**8.0**	**6.0**	**6.5**	**8.6**	**5.6**	**9.8**	**7.5**	**7.2**

(a) This table follows the Australian convention of labelling Australian data for a financial year by the second year (that is, 1974–75 data are labelled 1975), whereas data for Australia in OECD publications are labelled by the first year (that is, 1974–75 data are labelled 1974).

(b) West Germany only.

(c) Unweighted means.

(d) Unweighted means. Excludes USA.

Source: OECD 1993; AIHW unpublished data

Table S51: *Proportion of population with basic and supplementary hospital insurance,*[a] *States, 1983 to 1993 (per cent)*

Date	NSW[b]	Vic	Qld	WA	SA[c]	Tas	Aust
Basic							
31 December 1983	63.9	70.2	38.9	60.5	66.3	64.7	61.5
31 December 1984	47.0	52.8	35.5	52.0	54.2	51.4	47.9
31 December 1985	50.1	53.8	35.6	50.9	53.4	50.6	49.1
31 December 1986	51.5	55.0	34.7	47.2	51.3	50.7	49.2
31 December 1987	50.5	52.2	33.3	45.5	49.3	49.6	47.5
31 December 1988	49.3	50.3	32.7	43.6	48.3	48.8	46.2
31 December 1989	47.0	50.0	32.1	41.8	44.3	48.2	44.5
31 December 1990	47.0	51.2	31.8	40.8	43.1	46.9	44.5
31 December 1991	45.2	44.5	32.8	41.0	40.0	43.8	41.9
31 December 1992	43.4	42.0	32.7	40.8	37.8	42.7	40.4
31 December 1993	41.0	38.9	32.9	39.6	35.6	40.2	38.4
Supplementary							
31 December 1983	21.6	36.7	19.9	32.3	41.0	46.8	28.8
31 December 1984	24.2	35.6	24.2	33.1	40.0	43.3	30.0
31 December 1985	30.1	41.1	24.9	35.1	40.3	43.5	33.9
31 December 1986	32.8	43.0	24.5	39.9	39.4	44.4	35.7
31 December 1987	38.7	42.8	26.6	40.9	40.8	44.5	38.3
31 December 1988	39.6	42.1	26.7	39.9	41.4	44.6	38.4
31 December 1989	39.5	43.3	26.9	38.9	38.7	44.8	38.4
31 December 1990	40.1	46.6	27.1	38.4	39.3	44.2	39.4
31 December 1991	39.1	40.7	28.5	39.0	37.4	41.5	37.6
31 December 1992	38.1	39.1	28.8	39.3	36.0	40.9	36.7
31 December 1993	36.5	36.7	29.5	34.1	38.4	38.8	35.3

(a) Holding basic insurance is a prerequisite for taking out supplementary insurance cover. Therefore, the population holding supplementary insurance is included in the data for those holding basic insurance coverage.

(b) Includes ACT.

(c) Includes NT.

Source: Private Health Insurance Administration Council unpublished data

Table S52: *Private health insurance, proportions of contributor units with hospital coverage, by age group, 1983 to 1992*

	Per cent of contributor units				
Age group of head of contributor unit (years)	**1983**	**1986**	**1988**	**1990**	**1992**
15–24	54.6	29.3	30.0	29.5	29.3
25–34	70.4	46.5	43.0	40.1	35.8
35–49	75.6	55.5	53.8	52.7	46.7
50–59	71.4	56.4	56.5	55.6	52.2
60–69	45.3	42.0	43.4	45.1	45.5
70 and over	36.0	31.5	34.9	36.8	36.4
All ages	**62.1**	**44.2**	**43.6**	**43.1**	**40.5**

Sources: Willcox 1991; ABS 1992 Health Insurance Survey unpublished data

Health labourforce

Table S53: *Employment in the health industry, August 1981 to August 1993*

Year	Employed in health industry	All employed persons	Proportion of all employed persons	Civilian labour force[a]	Proportion of civilian labour force[a]
	('000)	*('000)*	*(Per cent)*	*('000)*	*(Per cent)*
1981	406.1	6,393.7	6.4	6,774.3	6.0
1982	424.5	6,379.3	6.7	6,840.7	6.2
1983	440.6	6,241.1	7.1	6,927.9	6.4
1984	453.6	6,466.1	7.0	7,070.1	6.4
1985	461.6	6,675.6	6.9	7,248.3	6.4
1986	489.2	6,918.6	7.1	7,516.2	6.5
1987	510.5	7,092.3	7.2	7,694.4	6.6
1988	530.7	7,353,4	7.2	7,892.1	6.7
1989	520.3	7,727.6	6.7	8,197.0	6.3
1990	557.9	7,825.0	7.1	8,412.5	6.6
1991	580.0	7,669.2	7.6	8,475.2	6.8
1992	575.3	7,679.3	7.5	8,585.7	6.7
1993	561.4	7,684.9	7.3	8,609.1	6.5

(a) Includes unemployed persons looking for work.

Sources: ABS unpublished data; ABS Cat. No. 6203.0

Use of professional services

Table S54: *Medical and optometrical services, fees and benefits under Medicare, 1986–87 to 1992–93*

Year	Number of services	Fees charged	Schedule fees	Benefits paid
	(million)	*($ million)*	*($ million)*	*($ million)*
GP attendances				
1986–87	71.5	1,146.0	1,215.8	1,034.6
1987–88	75.8	1,324.0	1,407.4	1,197.3
1988–89	80.1	1,483.9	1,573.3	1,338.3
1989–90	85.2	1,677.4	1,775.0	1,509.3
1990–91	85.0	1,800.7	1,919.5	1,631.4
1991–92	89.0	1,974.4	2,135.2	1,781.8
1992–93	93.2	2,166.2	2,353.4	1,997.8
Specialist attendances				
1986–87	12.7	520.5	522.8	447.7
1987–88	13.0	584.4	582.1	491.5
1988–89	13.7	651.9	646.8	544.2
1989–90	14.3	719.9	707.0	595.0
1990–91	14.9	792.5	770.8	648.4
1991–92	15.6	863.7	840.6	705.0
1992–93	16.3	930.9	908.0	763.3
Obstetrics				
1986–87	0.6	58.1	52.9	49.2
1987–88	0.6	67.1	57.2	45.7
1988–89	0.6	74.1	59.8	45.9
1989–90	0.6	82.8	63.3	48.7
1990–91	0.6	95.4	76.0	58.3
1991–92	0.6	95.5	73.9	56.7
1992–93	0.7	93.7	71.8	55.3
Anaesthetics				
1986–87	1.3	83.0	76.4	66.3
1987–88	1.3	97.7	86.7	67.4
1988–89	1.4	107.5	94.1	71.3
1989–90	1.4	119.7	102.7	77.7
1990–91	1.5	135.5	113.5	85.9
1991–92	1.6	151.3	125.4	94.9
1992–93	1.6	165.4	137.9	104.4
Pathology[(a)]				
1986–87	27.2	485.3	501.0	427.1
1987–88	29.3	544.6	559.9	470.6
1988–89	31.5	600.5	605.7	507.6
1989–90	26.0	648.7	661.8	554.5
1990–91	26.1	729.0	754.2	631.9
1991–92	30.4	725.4	751.7	629.2
1992–93	39.7	734.5	757.0	634.0

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Table S54: *Medical and optometrical services, fees and benefits under Medicare, 1986–87 to 1992–93* (continued)

Year	Number of services	Fees charged	Schedule fees	Benefits paid
	(million)	*($ million)*	*($ million)*	*($ million)*
Diagnostic imaging				
1986–87	6.4	396.9	409.5	357.6
1987–88	6.7	429.4	414.2	353.1
1988–89	7.2	483.8	464.2	394.7
1989–90	7.7	554.8	537.4	458.7
1990–91	8.3	638.6	626.3	534.9
1991–92	8.5	683.9	678.8	578.8
1992–93	9.1	761.8	764.8	654.4
Operations				
1986–87	4.1	398.4	380.7	349.0
1987–88	3.7	423.7	392.7	319.6
1988–89	3.8	464.7	424.2	334.6
1989–90	4.1	526.0	474.6	375.3
1990–91	4.5	595.5	532.4	420.9
1991–92	4.7	666.4	594.0	468.8
1992–93	4.9	721.1	645.2	510.7
Optometry				
1986–87	1.9	65.3	72.4	62.2
1987–88	2.0	69.0	77.6	66.0
1988–89	2.2	76.2	85.8	73.0
1989–90	2.4	87.1	98.8	84.1
1990–91	2.6	99.4	113.6	96.6
1991–92	2.8	108.6	124.8	106.1
1992–93	3.0	119.1	137.6	117.0
All other services[(b)]				
1986–87	3.1	108.6	107.8	92.9
1987–88	2.7	103.9	101.7	84.3
1988–89	2.9	114.9	111.7	91.9
1989–90	3.1	134.7	130.0	107.0
1990–91	3.4	169.4	162.6	135.2
1991–92	3.6	206.6	199.9	166.9
1992–93	3.8	229.5	222.7	186.8
Total services				
1986–87	128.8	3,262.0	3,339.3	2,886.5
1987–88	135.1	3,643.8	3,679.4	3,095.6
1988–89	143.4	4,057.7	4,065.5	3,401.4
1989–90	144.9	4,551.1	4,550.6	3,810.1
1990–91	146.9	5,056.0	5,069.1	4,243.3
1991–92	156.8	5,475.8	5,524.3	4,588.2
1992–93	172.3	5,922.1	5,998.5	5,023.7

(a) Pathology schedule structure changed in August 1989 with a 35% reduction in number of items. In February 1992, a patient episode initiation item was introduced, artificially inflating the number of pathology services (See Section 4.5 for more details).

(b) Includes radiotherapy and nuclear medicine therapy, assistance at operations and other miscellaneous items.

Source: DHHLGCS unpublished data

Table S55: *Medicare services, age-specific rates, by sex, 1987–88 to 1992–93 (per person)*

Sex / Age group	**1987–88**	**1988–89**	**1989–90**	**1990–91**	**1991–92**	**1992–93**
Males						
0–4	8.09	8.48	8.67	8.49	8.90	9.69
5–9	4.68	4.94	5.09	4.76	5.00	5.39
10–14	3.91	4.09	4.23	3.98	4.22	4.50
15–19	3.94	4.12	4.32	4.22	4.37	4.68
20–24	4.30	4.42	4.45	4.37	4.57	4.90
25–34	4.73	4.90	4.89	4.88	5.14	5.49
35–44	5.51	5.76	5.71	5.72	6.00	6.39
45–54	7.31	7.47	7.37	7.39	7.66	8.22
55–64	10.05	10.53	10.76	10.98	11.70	12.74
65–74	10.99	11.18	11.32	11.47	12.55	14.19
75 and over	15.68	16.08	16.32	16.43	17.35	18.74
Crude rate	**6.40**	**6.65**	**6.73**	**6.72**	**7.11**	**7.73**
Age-standardised rate(a)	**6.54**	**6.77**	**6.85**	**6.82**	**7.20**	**7.79**
Females						
0–4	7.31	7.73	7.91	7.71	8.10	8.84
5–9	4.66	4.91	5.04	4.73	4.99	5.39
10–14	4.08	4.30	4.39	4.17	4.39	4.68
15–19	6.82	7.25	7.34	7.31	7.62	8.18
20–24	9.93	10.23	9.96	9.70	10.20	11.13
25–34	11.04	11.47	11.09	10.89	11.38	12.40
35–44	9.49	10.00	9.84	9.81	10.36	11.27
45–54	10.76	11.19	11.09	11.18	11.71	12.77
55–64	12.38	12.87	12.89	13.03	13.85	15.05
65–74	15.01	15.44	15.48	15.50	16.46	17.74
75 and over	18.44	18.83	19.15	19.33	20.41	21.84
Crude rate	**9.90**	**10.33**	**10.29**	**10.24**	**10.81**	**11.75**
Age-standardised rate(a)	**9.75**	**10.16**	**10.10**	**10.01**	**10.54**	**11.43**

(a) Reference population is the 30 June 1988 Australian population.

Sources: Health Insurance Commission 1988, 1989, 1990, 1991, 1992, 1993; AIHW unpublished data

Table S56: *Medicare services, age-specific rates, by sex, States and Territories, 1992–93 (per person)*

Sex / Age group (years)	**NSW**	**Vic**	**Qld**	**WA**	**SA**	**Tas**	**ACT**	**NT**	**Aust**
Males									
0–4	10.42	9.37	9.69	8.42	10.04	8.63	9.66	6.12	9.69
5–9	5.86	5.39	5.27	4.62	5.28	4.79	5.22	2.99	5.39
10–14	4.93	4.32	4.56	3.91	4.30	4.10	4.50	2.60	4.50
15–19	5.17	4.45	4.75	4.06	4.51	4.01	4.20	2.83	4.68
20–24	5.53	4.94	4.58	4.04	4.70	4.20	3.82	2.77	4.90
25–34	6.32	5.39	5.05	4.52	5.26	4.65	4.52	3.43	5.49
35–44	7.35	6.06	6.20	5.38	5.96	5.31	5.36	4.45	6.39
45–54	9.45	7.68	7.96	7.10	7.51	7.06	6.95	5.94	8.22
55–64	14.67	12.03	11.86	11.24	11.51	10.89	10.84	8.58	12.74
65–74	15.70	13.60	13.22	13.89	13.50	10.33	13.07	9.33	14.19
75 and over	20.26	18.70	17.90	17.51	17.31	15.19	17.28	9.84	18.74
Crude rate	**8.76**	**7.47**	**7.35**	**6.62**	**7.46**	**6.54**	**6.27**	**4.37**	**7.73**
ASR[(a)]	**8.74**	**7.51**	**7.46**	**6.84**	**7.37**	**6.54**	**6.90**	**4.95**	**7.79**
Females									
0–4	9.53	8.46	8.97	7.70	9.06	8.02	8.86	5.38	8.84
5–9	5.79	5.39	5.29	4.62	5.41	4.83	5.44	3.05	5.39
10–14	5.00	4.55	4.71	4.23	4.57	4.58	4.58	2.88	4.68
15–19	8.75	7.44	8.68	7.78	7.69	8.42	7.25	6.86	8.18
20–24	12.14	10.60	11.05	10.64	10.15	11.33	9.58	8.73	11.13
25–34	13.37	12.07	12.05	11.85	11.67	11.73	11.58	9.12	12.40
35–44	12.43	10.77	11.06	10.35	10.54	10.20	10.21	8.56	11.27
45–54	14.14	12.04	12.57	11.77	11.94	11.64	10.97	9.15	12.77
55–64	16.81	14.15	14.77	13.53	13.68	13.46	12.99	9.71	15.04
65–74	19.48	16.81	17.83	16.20	16.00	15.41	15.09	11.33	17.74
75 and over	22.70	21.97	22.10	20.06	20.40	19.43	19.24	13.18	21.84
Crude rate	**12.88**	**11.35**	**11.54**	**10.62**	**11.22**	**10.81**	**10.02**	**7.43**	**11.75**
ASR[(a)]	**12.44**	**10.95**	**11.35**	**10.54**	**10.71**	**10.58**	**10.28**	**7.99**	**11.43**

(a) Age-standardised rates. Reference population is the 30 June 1988 Australian population.

Sources: Health Insurance Commission 1993; AIHW unpublished data

Table S57: *Medicare services, percentage of enrolled persons by number of services, by age group and sex, 1991–92 (per cent)*

	Number of services					
Sex / Age group	**0**	**1**	**2**	**3**	**4**	**5 or more**
Males						
0–4	7.83	7.52	8.20	8.38	7.99	60.08
5–9	16.90	13.13	12.04	10.37	8.67	38.89
10–14	21.73	15.73	13.07	10.40	8.17	30.90
15–19	23.46	15.58	12.46	9.75	7.67	31.08
20–24	28.05	14.35	11.17	8.85	7.06	30.52
25–34	31.06	13.70	10.40	8.08	6.46	30.30
35–44	26.49	13.24	9.96	7.90	6.46	35.95
45–54	21.45	11.80	8.94	7.21	6.22	44.38
55–64	17.77	7.96	6.53	5.75	5.31	56.68
65–74	30.15	5.53	4.40	3.97	3.75	52.20
75 and over	46.79	2.76	2.29	2.16	2.14	43.86
All ages	**24.93**	**11.64**	**9.35**	**7.68**	**6.43**	**39.97**
Females						
0–4	8.69	8.47	9.05	8.94	8.38	56.47
5–9	16.94	13.40	12.17	10.50	8.58	38.41
10–14	21.29	15.77	12.97	10.41	8.09	31.47
15–19	14.70	11.46	10.34	8.91	7.55	47.04
20–24	13.42	6.48	6.84	6.83	6.50	59.93
25–34	15.29	5.79	6.01	6.06	5.83	61.02
35–44	13.78	7.52	7.05	6.88	6.36	58.41
45–54	11.30	6.54	5.91	5.85	5.75	64.65
55–64	12.00	5.28	4.87	4.88	4.83	68.14
65–74	17.32	3.64	3.48	3.52	3.61	68.43
75 and over	40.50	1.77	1.73	1.79	1.94	52.27
All ages	**16.63**	**7.35**	**6.92**	**6.53**	**5.98**	**56.59**

Source: Health Insurance Commission 1993

Health technology

Table S58: *Usage of selected health technologies, 1987–88 to 1991–92*(a)

	1987–88	1988–89	1989–90	1990–91	1991–92
Services					
Ultrasound ('000)	895.5	1,026.1	1,176.2	1,348.3	1,495.9
CT scanning ('000)	298.7	328.2	358.5	406.6	448.1
X–rays ('000)	5,358.3	5,565.9	5,982.8	6,432.3	6,438.6
MRI (Number)	5,637	8,438	10,705	12,373	(b)
Pathology ('000)	29,543.7	31,825.9	24,342.9	25,779.2	26,022.6
Nuclear medicine ('000)	124.3	238.5	151.3	137.8	155.9
Radiotherapy ('000)	324.4	258.6	274.8	287.0	316.7
Endoscopy ('000)	526.9	584.8	645.4	702.4	751.7
Services as a percentage of total Medicare services(c)			(Per cent)		
Ultrasound	0.7	0.7	0.8	0.9	1.0
CT scanning	0.2	0.2	0.3	0.3	0.3
Radiology	3.9	3.9	4.2	4.4	4.1
Pathology	21.7	22.3	17.1	17.7	16.6
Nuclear medicine	0.1	0.2	0.1	0.1	0.1
Radiotherapy	0.2	0.2	0.2	0.2	0.2
Endoscopy	0.4	0.4	0.5	0.5	0.5
			(Number)		
Lasers in: Ophthalmology	29,785	33,768	39,567	44,533	58,131
Gynaecology	–	8,076	12,633	11,038	11,308
Dermatology	–	6,743	7,821	7,964	7,634
Gastrointestinal tract	–	–	–	–	99
Ear, nose and throat	239	225	256	348	296
Laparoscopic procedures					
Laparoscopic cholecystectomy	–	–	–	1,984	13,863
Laparoscopy for gynaecological conditions	24,075	25,024	25,345	25,318	21,266
Female sterilisation including laparoscopy	20,978	19,519	17,732	14,215	13,311
Diagnostic laparoscopy	17,427	16,970	16,379	16,730	17,145
Ocular lens extraction	29,614	31,300	33,018	35,574	38,304
Artificial lens insertion, removal, repositioning	30,612	32,211	33,928	36,322	38,985
Shockwave lithotripsy	1,180	1,409	1,481	2,036	2,196
Cardiac pacemakers	948	954	1,133	1,214	1,424

(a) Only covers serices for which fees were charged under Medicare. Does not include services to public inpatients.

(b) As from 1 February 1992, MRI services were covered under Health Program Grants, rendering the Medicare benefit item superfluous.

(c) Recorded on a date-rendered basis.

Source: Health Insurance Commission unpublished data

Table S59: *Health technology facilities in Australia, 1993*

Type of health technology or facility	Number
Magnetic resonance imaging (MRI) scanner	32
CT scanners	292
Extracorporeal shockwave lithotriptors (ESWL)	12
Mammographic units	258
Ultrasound equipment	1,300–1,400
Nuclear medicine centres	69
Cardiac surgery units	26

Sources: AIHW 1992, 1993; National Heart Foundation 1991

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Appendix

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. Readers are also referred to the Glossary.

Age-standardisation has been used to facilitate the comparison of populations with differing age compositions, either different populations at a point in time or the same population at different points in time. The 1988 Australian population (ABS 1989) has been used as the standard population for all intra-Australia comparisons, but the European and World Standard Populations have been used for some international comparisons. Details of these standard populations were published in *Australia's health 1992*.

In rates derived from population surveys, uncertainty results from the fact that only a sample of the population was included. In some places, this is shown by confidence intervals. In other places, differences which are statistically significant are indicated by an asterisk. in the text, they are described as 'significant'. Neither approach allows for non-sampling errors, such as those which may arise from reporting biases or misclassification.

Average annual rates of change or growth rates have been calculated as geometric rates:

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 diseases follows the Ninth Revision of the International Classification of Diseases (WHO 1977), and as adapted for hospital indexing by the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) (1991).

References

References use a simplified version of the author-date (or Harvard) system. General references to ABS series (for example, the Deaths, Australia series) provide full identifying information, including Catalogue number, but do not include a year of publication. References to specific issues within a series include a year of publication.

Symbols

$	Australian dollars, unless otherwise specified
–	zero
%	per cent
g	gram
kg	kilogram

kJ	kilojoule
m	million
MJ	megajoule
mL	millilitre
mm Hg	millimetres of mercury
mmol/L	millimoles per litre
na	not applicable, not available
nec	not elsewhere classified
nn	not notifiable
nya	not yet available
μg	microgram

Geographic classifications

Within Australia, most regional comparisons are between States and Territories. Largely reflecting variations in the classifications used in the data sources, the definitions for other regional comparisons are not always precise. For example, comparisons are made between major urban and other areas. Some sources do not include all capital cities as urban, while others include other major centres such as Newcastle and Wollongong.

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Abbreviations

ABS	Australian Bureau of Statistics
ACCORD	Australian Coordinating Committee for Organ Registries and Donation
AHMAC	Australian Health Ministers' Advisory Council
AHMC	Australian Health Ministers' Conference
AHOCH	Australian Health Outcomes Clearing House
AHTAC	Australian Health Technology Advisory Committee
AIDS	Acquired Immune Deficiency Syndrome
AIH	Australian Institute of Health
AIHW	Australian Institute of Health and Welfare
ANZDATA	Australian and New Zealand Dialysis and Transplant Registry
ARC	Accident Research Centre
ASR	Age standardardised rate
BAC	Blood alcohol concentration
BMI	Body mass index
BPH	Benign prostatic hypertrophy
CABG	Coronary artery bypass graft
CAPD	Continuous ambulatory peritoneal dialysis
CGC	Commonwealth Grants Commission
CHD	Coronary heart disease
CI	Confidence interval
CIN3	Cervical intra-epithelial neoplasia grade 3
COI	Cost of illness
CPI	Consumer price index
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CT	Computerised tomography.
CVD	Cardiovascular disease
DCIS	Disease costs and impact study
DCSH	Department of Community Services and Health
DHHCS	Department of Health Housing and Community Services
DHSH	Department of Human Services and Health
dift	Decayed, indicated for extraction, or filled primary teeth
dmft	Decayed, missing or filled primary teeth
DMFT	Decayed, missing or filled permanent teeth
DSRU	AIHW Dental Statistics and Research Unit

DVA	Department of Veterans' Affairs
ENT	Ear nose and throat
ESWL	Extracorporeal shock wave lithotripsy
GDP	Gross domestic product
GP	General practitioner
HCN	Health communication network
HHLGCS	Department of Health Housing Local Government and Community Services
HIC	Health Insurance Commission
HIV	Human immunodeficiency virus
HUCS	Hospital Utilisation and Costs Study
ICD	International Classification of Diseases
ICD-9-CM	International Classification of Diseases Ninth Revision, Clinical Modification
ID	Intravenous drug
IRSD	Index of relative socio-economic development
IVF	In vitro fertilisation
Metro	Metropolitan
MRI	Magnetic resonance imaging
NDI	National Death Index
NDS	National Data Set
NHDC	National Health Data Committee
NHDD	National Health Data Dictionary
NHIA	National Health Information Agreement
NHL	non-Hodgkin's lymphoma
NHMRC	National Health and Medical Research Council
NHS	National Health Survey or National Health Service
NHGT	National Health Goals and Targets
NIDDM	non-insulin-dependent diabetes mellitus
NISU	AIHW National Injury Surveillance Unit
NMSC	non-melanocytic skin cancer
NMDS [IS]	National Minimum Data Set (Injury Surveillance)
NNS	National Nutrition Survey
non-Metro	non-Metropolitan
NPSU	AIHW National Perinatal Statistics Unit
OECD	Organisation for Economic Co-operation and Development
OTC	Over-the-counter drug

Pap	Papanicolau
PBS	Pharmaceutical Benefits Scheme
PHIAC	Private Health Insurance Administration Council.
PMIs	Patient Management Information systems
PORT	Patient Outcome Research Team
PYLL	Years of Life Lost
QALY	Quality Adjusted Life Year
RDI	Recommended Dietary Intake
RFPS	Risk Factor Prevalence Study
RPBS	Repatriation Pharmaceutical Benefits Scheme
RR	Relative risk
SF-36	Medical Outcome Survey 36-Item Short Form Questionnaire 4466
SLA	Statistical local area
SMR	Standardised Mortality Ratio
SSPE	Subacute Sclerosing Panencephalitis
TURP	Transurethral resection of prostate
WHO	World Health Organization
WHR	Waist to hip ratio

Abbreviations of 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
Swe	Sweden
Tas	Tasmania
UK	United Kingdom
USA	United States of America
Vic	Victoria
WA	Western Australia

Glossary

Aboriginal: A person of Aboriginal or Torres Strait Islander descent who identifies as an Aboriginal or Torres Strait Islander and is accepted as such by the community in which he or she lives (Department of Aboriginal Affairs 1981).

acute: Having a short course.

acute hospitals: Establishments which provide at least minimal medical, surgical or obstetrical services for inpatient treatment and/or care, and which provide round-the-clock comprehensive qualified nursing service as well as other necessary professional services. Most patients require a relatively short stay.

admission: Admission to hospital. In this report, the number of separations (q.v.) has been taken as the number of admissions. Hence an admission rate is the same as a separation rate.

admitted patient: See inpatient.

age-specific death rate: See Box 1.1, page 5.

age-specific rate: A rate for a specific age group. The numerator and denominator relate to the same age group.

age-standardised death rate: See Box 1.1, page 5.

age-standardised rate: Weighted average of age-specific rates according to a standard distribution of age to eliminate the effect of different age distributions and thus facilitate valid comparison of groups with differing age compositions.

bed-day: The occupancy of a hospital bed for up to 24 hours.

capital expenditure: Expenditure of a non-recurrent nature (for example, new buildings, equipment used for a number of years).

casemix: A means of classifying hospital patients to provide a common basis for comparing cost effectiveness and quality of care across hospitals.

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 ninth revision of the International Classification of Diseases (q.v.). The underlying cause is defined as the disease which 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.

chronic: Persisting over a long period.

confidence interval (CI): A range determined by variability in data, within which there is a specified (usually 95%) chance that a calculated parameter (e.g. relative risk) is thought to lie.

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 an environmental factor.

crude death rate: See Box 1.1, page 5.

direct bill: The process by which a medical practitioner or optometrist sends the bill for services direct to Medicare.

disability: See Box 1.3, page 11.

employed: Employed people are those aged 15 years and over who, during the reference week: worked for one hour or more for pay; worked for one hour or more without pay in a family business; or had a job but were not at work because of leave or other reasons. Unemployed are those aged 15 years and over who were not employed in the reference week and: had actively looked for work; were available for work; or were waiting to start a new job or be called back to a job from which they had been stood down for less than 4 weeks. The labourforce comprises employed and unemployed; others are described as not in the labourforce (ABS 6203.0).

epidemiology: The study of the distribution and determinants of health-related states and events in populations, and the application of this study to control of health problems.

expectation of life: See life expectancy.

foetal death: Birth of a foetus weighing at least 500 grams (or where birthweight is unavailable, of at least 22 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: A private hospital where only minor operations and other procedures not requiring overnight stay are performed, not forming part of any private hospital providing overnight care.

handicap: A social disadvantage resulting from disability or impairment.

health promotion: Activities to improve health and prevent disease.

hostels: Establishments providing board, lodging or accommodation for the aged, distressed, or disabled who cannot live independently but do not need nursing care in a hospital or nursing home. Residents are generally responsible for their own provisions, but may be provided with domestic assistance (meals, laundry, personal care). Only hostels subsidised by the Commonwealth are included in statistics.

incidence rate: The number of instances of illness commencing, or of persons falling ill, during a given period in a specified population divided by the population at risk.

inpatient: A person formally admitted by a hospital. Healthy newborn infants are not regarded as inpatients unless they have a stay of more than 10 days, or are the second or subsequent birth in multiple births. Also known as admitted patient.

intersectoral action: Involvement of government sectors other than the health sector in actions affecting health.

International Classification of Diseases: WHO's internationally accepted classification of death and disease. The ninth revision (ICD-9) is currently in use. In this report, causes of death classified before 1979 under previous revisions have been reclassified to ICD-9 by AIHW.

length of stay: Duration of hospital stay, counted by regarding the days of admission and of separation as one day, plus all intervening days. Where a patient is admitted and discharged on the same day, the length of stay is taken as one day.

life expectancy: Average number of years of life remaining to a person at a particular age if death rates do not change.

low birthweight: Birth of a baby weighing less than 2,500 grams.

morbidity: Any departure, subjective or objective, from a state of physiological or psychological wellbeing.

neonatal death: Death of an infant within 28 days of birth.

neonatal mortality rate: Number of neonatal deaths per 1,000 live births.

non-inpatient: A patient not requiring admission to hospital, but who receives treatment in accident and emergency (casualty) departments, undergoes short-term specialist treatment (such as minor surgery, radiotherapy or chemotherapy), or is treated at home. Previously referred to as outpatient, also known as non-admitted patient.

nursing homes: Establishments which provide long-term care involving regular basic nursing care to chronically ill, frail, disabled or convalescent people or senile inpatients.

Organisation for Economic Co-operation and Development: An organisation of 24 developed countries, including Australia.

outpatient: See non-inpatient.

Pap smear: Papanicolaou smear, a procedure for the detection of cancer and pre-cancerous conditions of the female genital tract.

perinatal: Pertaining to or occurring in the period shortly before of after birth.

perinatal death: Foetal or neonatal death.

perinatal mortality rate: Number of perinatal deaths per 1,000 total births (foetal deaths plus live births).

potential years of life lost: Number of potential years of life lost in a population as a result of premature death.

prescription drugs: Pharmaceutical drugs available only on the prescription of a registered medical practitioner and available only from pharmacies.

prevalence: The number of instances of a given disease or other condition in a given population at a designated time divided by the population at risk of having the disease or condition.

private health insurance: See Box 3.3, page 136.

private hospitals: Privately owned and operated institutions approved by DHSH. Private hospitals cater only for private patients who are treated by a doctor of their own choice and are charged fees for accommodation and for medical services. Private hospitals can be further classified as acute or psychiatric.

psychiatric hospitals: Establishments devoted primarily to the treatment and care of inpatients with psychiatric, mental, or behavioural disorders.

public health: One of the efforts organised by society to protect, promote, and restore the people's health. It is the combination of sciences, skills, and beliefs that are directed to the maintenance and improvement of the health of all the people through collective or social actions. The programs, services, and institutions involved emphasise the prevention of disease and the health needs of the population as a whole. Public health activities change with changing technology and social values, but the goals remain the same: to reduce the amount of disease, premature death, and disease-produced discomfort and disability in the population. Public health is thus a social institution, a discipline, and a practice.

public hospitals: Hospitals providing free shared-ward accommodation for all who require it and free treatment there by a hospital-appointed doctor. In addition, they provide, to those who are prepared to pay for it (for example, through private insurance), private ward accommodation and the doctor of choice. Thus, public hospitals service much private medical practice as well as public.

quality adjusted life year (QALY): A measure of the outcome of actions (either individual or treatment interventions) in terms of their health impact. If an action gives a person an extra year of healthy life expectancy, that counts as one QALY. If an action gives a person an extra year of unhealthy life expectancy (partly disabled or in some distress), it has a value of less than one. Death is rated at zero.

quintile: Strictly the five values at or below which 20%, 40%, 60%, 80% and 100% of the data in a sample fall. The term is also used to denote the successive one-fifths of the values in a sample which are bounded by the lowest value and each of the other values.

real cost: Cost expressed in terms which have been adjusted for inflation (for example, in 1984–85 dollars). This enables comparisons to be made between expenditures in different years.

recurrent expenditure: Expenditure which recurs continually or very frequently (for example, salaries). It may be contrasted with capital expenditure, such as the cost of hospital buildings and diagnostic equipment, for which expenditure is made infrequently.

repatriation general hospitals: Acute care hospitals run by the Commonwealth Department of Veterans' Affairs.

risk: The probability that an event will occur.

risk factor: An attribute or exposure that is associated with an increased probability of a specified outcome, such as the occurrence of a disease. Risk factors are not necessarily causes of disease.

Risk Factor Prevalence Study: A series of three surveys conducted by the National Heart Foundation of Australia in 1980, 1983 and 1989.

separation: When an inpatient leaves hospital to return home, transfers to another institution, or dies.

separation rate: The number of separations per 1,000 total population per year.

stillbirth: See foetal death.

symptom: Any evidence of disease apparent to the patient.

Torres Strait Islander: See Aboriginal.

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