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Australia's health 1990

The second biennial report of the Australian Institute of Health

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The Australian Institute of Health is an independent statistics and research agency within the Federal Community Services and Health portfolio. It comprises three major research divisions—Health Services, Health Technology and Health Monitoring.

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AUSTRALIAN INSTITUTE OF HEALTH

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

Dear Minister

As required under Subsection 31(1) of the *Australian Institute of Health Act 1987*, the Board of the Institute is pleased to present to you *Australia's health 1990*, 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.

This second biennial report by the Institute contains a feature chapter on the health of older Australians.

Yours sincerely

Peter Karmel

Peter Karmel
Board Chairman

JA Bisset
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December 1990

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1 Introduction

The past few years have seen some significant developments in the health sector in Australia. By most available measures, the health of most Australian people has continued to improve steadily. In both the traditional health services and in the recently revitalised public health and prevention areas, important new initiatives have occurred. It is worth reflecting on these developments.

The link between a country's health services and its health is complex. The principal role of most health services has been to provide care for people once they have become sick. These services continue to improve. For example, the survival in childhood leukemia has improved greatly over the past 30 years. Such changes may result in some improvement in the overall health of the population, as measured by currently available indicators. However, in many areas, the evidence suggests that other factors have had a much greater effect.

The assessment of the health of a population still draws on a few key indicators, which are, in fact, rather limited measures. Mortality statistics, central in most measures of health status, address only part of wider definitions of health, such as a 'state of complete physical, mental and social well-being, not merely the absence of disease or infirmity' (World Health Organization 1946). Further work is needed on the development of measures to describe these other dimensions of health.

The relationship between health and health services

The relationship between declining death rates and use of health services is tenuous. Various studies have shown that the main determinants of a country's death rates are the living conditions of its people. In Australia, as in other developed countries, death rates from most major infectious diseases had declined dramatically before any effective treatment or vaccine was available. McKeown (1976) concluded that in England and Wales the decline in death rates for these diseases was mainly attributable to improvements in nutrition and the physical environment. Similarly, recent declines in the death rates from circulatory diseases in Australia and other developed countries have been due largely to changes in diet, smoking, and possibly exercise, although the management of high blood pressure has also played a part.

Recent studies have reported a positive relationship between total expenditure on health services and life expectancy, infant mortality, and age-standardised mortality rates, if allowance is made for changes in diet and other behavioural factors, including smoking (Wolfe 1986, Wolfe and Gabay 1987).

Links between mortality and health expenditure are more likely to be found for particular conditions and sections of the population.

In principle, relationships between health expenditure and morbidity and measures of well-being are more likely to be demonstrable, but statistics are limited. Hospital statistics provide some evidence, but give a relatively narrow perspective and have technical limitations. The health surveys conducted by the Australian Bureau of Statistics provide some information on people with health problems, but, as the surveys rely on self-reporting, changes over time in part reflect shifts in society's perception of such problems. Measures of other aspects of health mentioned in the WHO definition are often not available, and statistics and methodology are in need of development.

Information on handicap and disability gives further insights, but the major surveys also rely on self-reporting. Services for those with a handicap or disability may increase because of greater awareness in the community, decreasing acceptance that a disability must be tolerated, and increased technical capacity to meet this perceived need. In addition, some types of disability will become more common with demographic changes, particularly increases in the number of older people. Better outcomes of services for handicap or disability may not appear in mortality or hospital morbidity statistics, but still represent significant improvements in health.

Use of health services will in part be driven by societal values and expectations. There is discussion in the community generally, and among health care professionals, on placing increasing emphasis on quality of life, including freedom from pain and independence from institutional and other formal health care systems. Development of measures such as quality adjusted life years (QALYs) and disability free years will meet some of the gap between available statistics and the need for improved descriptions of various aspects of the nation's health. For cancer, for example, available information on death rates could be supplemented by data on life years gained through intervention, the quality of those years, and the cost of obtaining them. Such measures have the potential to more accurately reflect the impact of Australia's health care services on the population's health.

Some issues facing the health services

Health services over the last decade have been under increased scrutiny. General economic conditions have resulted in a much greater pressure to justify expenditure and have generated concerns about new technologies. Mechanisms have been developed to review the costs and benefits of health services, and more attention has been given to consumer interests and patient rights.

There has been an increased emphasis on the efficiency and effectiveness of service delivery and on quality of care. There has also been an increased willingness to invest in prevention programs in the belief that these will reduce the need for treatment services.

Throughout Australia, health services have been through major reorganisations over the last decade, with the aim of increasing their efficiency and effectiveness. Most hospitals have gone through substantial changes. There have been strong moves towards decentralisation, and attempts to strengthen community services.

There is some concern that investment in technology may have outpaced investment in basic infrastructure.

In a new initiative addressing costs in the health sector, particularly in hospitals, the Commonwealth Government has provided funds to promote the introduction of casemix accounting. The aim is to document variation in the cost of management of conditions which could be expected to have a reasonably standard cost. In the United States, this approach has been used as a basis for controlling the cost of reimbursement schemes. In Australia, it seems likely to be used both for management and reimbursement purposes. This approach can be expected to result in pressure being applied to practitioners and centres whose costs are significantly higher than the average.

Broader issues relating to health financing will be addressed as part of the development of a National Health Strategy, initiated recently by the Commonwealth Government.

Efficiency and effectiveness of health services

In current economic circumstances, it will be necessary for governments throughout Australia to contain health care costs, where possible by improving efficiency.

Many health care professionals view with concern these continuing attempts to contain costs, fearing that cost–cutting in the search for efficiency may threaten effectiveness and quality of care, and result in patients being denied the best treatment.

Clinical effectiveness and quality assurance are important professional issues. Most providers of health services are committed to delivering the best possible care and are concerned when they are not able to do so.

At one level, an effective method of monitoring the quality of care is by investigation of those outcomes which are usually preventable. Investigations of maternal and anesthetic deaths are well known examples. Effective assessment of the standard of more routine situations is more elusive.

Manning and De Bakey (1987) have suggested that, to profit most by experience, doctors need some objective means of examining their practice: practice analysis 'shows what is actually being done and what requires correction'. Constructive analysis of events in practice is seen as a vehicle for doctors to continue their education, whereas draconian penalties could be counterproductive.

In Australia, a number of professional bodies are active in promoting continuing education courses and contributing to practice guidelines and standards of health care.

Australia is moving in a similar direction to the Netherlands, which has already established practice guidelines for general practitioners (Grol et al 1988). A recent survey of members of the Royal Australian College of General Practitioners found that attitudes were generally favourable towards a practice–based quality assurance program (Steven et al 1989).

The systematic development of clearly defined standards in critical areas of health care has the potential also to produce significant improvement in the quality of care.

The cost of improved effectiveness

Eliminating unnecessary, inappropriate or poorly administered services will improve efficiency and provide benefits to the health service and to patients. However, reducing the number of diagnostically or therapeutically useful services may reduce costs in the short term, possibly at the price of decreased effectiveness and poorer health outcomes.

Given that health care budgets are limited, there seems likely to be continuing pressure on those who provide health services to contain costs and direct available resources in the most appropriate manner. This situation will produce stress and difficult choices, given the variety of competing claims, the limited information on outcomes and restricted options for altering allocation of resources to some areas.

For example, many costs are incurred in health care in the last few months of life. This may marginally increase the length of life but the added life may be of reduced quality. It has been argued that these costs could be substantially reduced by a change in practice from 'do no harm' to 'employ a treatment only when it will make a noticeable improvement' (Thurow 1985).

It may be difficult to change with current practices, given community and professional attitudes. It may also be the case that the last few months of life will increasingly be associated with acceptable quality of life. Health professionals in many areas of practice have concerns that overall mortality statistics, and other commonly used health measures, do not reflect the progressive gains in the management of patients that have occurred over many years, the improved outcomes in some groups, and the decreased burden on patients and their families.

Demographic changes will increasingly focus planning and organisation of health services towards the appropriate care of older people, and sharpen the debate on such issues. Provision of non-institutional care, extension of independent living and availability of support services will continue to be major concerns for health care providers and planners.

Health care professionals will continue to face the realities of continuing concern for their patients, peer pressure, requirements for evaluation and accountability, the demands of new methods, and new knowledge and retraining.

Leeder (1989) recognised the difficulty in which clinicians could find themselves if they were to, on the one hand, act as patient advocates for the best possible care, as they are required to ethically, and, on the other, make decisions about rationing care to rival contenders. Nevertheless he suggested that clinicians be given more responsibility in choosing the most effective way of using resources in the care of their patients.

Wider application of health care technologies will increase the cost of health services. Health technologies offer gains to health status and standards of care, but their introduction is often poorly controlled and inadequately evaluated. Much of the impact of health care technologies on costs arises not so much from the procurement of high unit cost machines and new services as from the need to update and extend established modalities, and address associated infrastructure requirements.

Preventive health programs

Health care services will remain the dominant component of the health system, but there is widespread agreement that there are limits to what they can achieve in terms of improving the health of the nation. Prevention services and programs represent a complementary approach with the promise of generating greater improvements in health.

The 1988 report of the Health Targets and Implementation Committee, *Health for all Australians*, and the subsequent development of the National Better Health Program, has substantially increased the emphasis in Australia on the promotion of healthy behaviour and healthy environments (physical and social), as well as the prevention of disease.

This trend may result in further pressure on health care services to demonstrate that they are cost effective, and that the resources used in treatment of disease and injury could not be better directed towards their prevention or the early detection.

Existing health services will continue to play an important role in primary and secondary prevention programs, for instance, in the primary prevention through immunisation against diseases such as measles and rubella; through the screening of blood for transfusions for evidence of HIV and hepatitis viruses; through screening for cancer of the cervix and of the breast; and through monitoring food and water to ensure purity.

Many prevention programs, however, are not linked closely to existing health care services. Some are of an educational nature, encouraging change in behaviours and lifestyle. The evaluation of such programs raises different issues, with some outcome measures being less readily defined. Prevention programs will continue to be subjected to scrutiny to establish whether they are cost effective, and whether they do in fact contribute to improved health and lessen the demand for treatment services. They may themselves rely heavily on technology, especially information technology.

Perhaps reflecting their more recent development, most present or planned prevention programs undergo more rigorous evaluation than some clinical services. The recent decision to initiate new programs for breast cancer screening benefited from a nationwide evaluation of a number of pilot projects. Substantial funds have also been committed to the evaluation of the National AIDS Strategy and the National Better Health Program. Evaluation and planning will need to focus on the technical performance of the method adopted, whether the method has suitable links to the condition it aims to prevent, whether there is adequate coverage of the population and whether there is appropriate reporting, feedback and evaluation. There will be a need to develop a consensus on the comparative cost–effectiveness of prevention and treatment programs, to guide the future development of health strategies.

Health targets and differentials

Both treatment services and preventive programs are being directed towards addressing inequalities in health and to meeting health goals and targets. There is a particular focus on major causes of illness and death and on risk factors. The hope is that encouragement of more healthy lifestyles, decrease in environmental hazards and appropriate use of health care services will lead to improvements in a range of areas of disability and ill health, including those which may be classified as epidemics in present Australian society.

A major challenge is to more effectively help those groups who are at significant disadvantage. Aborigines and Torres Strait Islanders have the lowest health status in this country. Others of low socioeconomic status, including some recent migrant groups, are also disadvantaged in terms of health status. Issues here will include assurance of equity and access to health services and more effective strategies to decrease risk taking behaviour.

The various issues mentioned here provide a context in which to consider the subsequent chapters. There is a need for properly informed decisions on approaches to improving the health of the nation based on improved statistics and measures of health status. There is also a need to assess the effectiveness of the strategies adopted.

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2 The health status of Australians

The health of Australians has improved steadily during the 20th century. Life expectancy has increased and there have been reductions in death rates at all ages and for a wide range of conditions. There have been major declines in infant mortality and, over the past 20 years, in mortality from heart disease and stroke and from road accidents.

However, moving against these favourable overall trends, cancer deaths continue to increase, suicide rates for young men are still rising, AIDS continues to be of concern and asthma-related deaths appear to be increasing. The reported prevalence of handicap and disability increased substantially in the 1980s.

National statistics also disguise the poor health status of some groups, particularly Aboriginal and Torres Strait Islander people and the socioeconomically disadvantaged. While many aspects of Australia's health compare favourably with other developed countries, there is room for improvement (Box 2.1). Much ill-health and many deaths are preventable, particularly those associated with tobacco smoking, alcohol consumption, poor nutrition, obesity and insufficient physical activity (Chapter 4).

In Australia, only birth and death registrations provide health-related data for the whole population (Box 2.2). The use of life expectancy as an indicator is described in Box 2.3.

Box 2.1: International comparisons

Comparisons are presented in this report between Australia and 23 countries selected either because of their historic ties to Australia or their position as world leaders in health. They include:

- **countries providing significant sources of immigrants to Australia (for which data are available); and**
- **all countries with a life expectancy of either sex at birth in 1987 (or latest earlier year for which data are available) greater than that of the same sex in Australia in 1987.**

Almost all of the 23 countries are developed industrial economies. Data are not available for some other countries, such as China and Vietnam, which have been significant sources of immigration to Australia. A set of countries including selected developing countries has been used for international comparisons of Aboriginal life expectancy. For the charts in which values of a health status indicator are shown for males and females separately, countries are ranked in order of male values.

Box 2.2: Health status data sources

The World Health Organization defines health as 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity' (WHO 1946). But even to describe the health of a population in the more limited terms of absence of disease and infirmity requires comprehensive data on quality of life, the level and types of sickness and disability in the population, and on mortality.

Hospital inpatient data provide details of illness regarded as severe enough to warrant admission to hospital. Data for all acute hospitals are available for three States only—New South Wales, Queensland and Western Australia. No regularly collected data are available for illness resulting in visits to hospital outpatient clinics, private medical practitioners or other providers of health care.

The Australian Health Surveys of 1978–79 and 1983 conducted by ABS provided glimpses of overall health and illness levels. Analyses were presented in *Australia's Health* (AIH 1988). The ABS is conducting another National Health Survey, which should provide detailed information on the levels of health and short-term and chronic illness in the population. Results will be available in 1991.

Information on disability and handicap is provided by the ABS 1988 Disabled and Aged Persons Survey.

Box 2.3: Life expectancy as a health indicator

Life expectancy is an estimate of the expected average number of years of life remaining to members of a group if their prevailing mortality pattern does not change. It is usually calculated using observed age specific death rates in a particular calendar year.

Life expectancies summarise the mortality experience of people born in many different years and are not estimates of the expected length of life of individuals born in a particular year. For example, the life expectancy of Australian females born in 1988 was 79.5 years. This means girls born in 1988 can expect to live, on average, 79.5 years if the mortality rates at each age in 1988 neither improve nor worsen over their lifetimes. If mortality rates continue to decrease in the future, then life expectancy will increase.

The purpose of calculating life expectancies is to summarise present mortality experience, not to predict the future lifespan of individuals. Life expectancy is a useful comparative indicator because, as with the age standardised death rate (Box 2.4), it is unaffected by the age distribution of the population. It also has the advantage of being expressed in years of life—a measure that is meaningful in terms of individual experience.

2.1 Life expectancy

Life expectancy in Australia has risen continuously during the 20th century, except in the early 1960s when it levelled off because of increasing death rates for cardiovascular disease, especially among males. Between 1905 and 1988, life expectancy at birth increased by 18 years to 73.1 years for males and by 21 years to 79.5 years for females (Table 2.1).

Table 2.1: Life expectancy at selected ages by sex, 1900 to 1988

	At birth		*At age 60*		*At age 80*	
Period	*Male*	*Female*	*Male*	*Female*	*Male*	*Female*
1900–1910	55.2	58.8	14.4	16.2	5.0	5.7
1946–1948	66.1	70.6	15.4	18.1	5.4	6.0
1960–1962	67.9	74.2	15.6	19.5	5.6	6.7
1970–1972	68.1	74.8	15.5	19.9	5.7	7.1
1980–1982	71.2	78.3	17.2	22.0	6.3	8.0
1988	73.1	79.5	18.4	22.8	6.7	8.4

Source: Australian Bureau of Statistics 3302.0

Life expectancy at older ages increased also, particularly in the 1970s and 1980s. In the 66 years between 1905 and 1971, life expectancy at age 60 increased by only 1.1 years for males and 3.7 years for females, while in the 17 years to 1988, it increased by 2.9 years for males and 3.0 years for females.

The difference between male and female life expectancy at birth widened considerably, from 3.6 years at the beginning of the century to a maximum of 7.1 years in 1980, but has since narrowed. In 1988 it was 6.4 years. There was also a similar widening of the gap between males and females at older ages, but the difference between male and female life expectancies at age 60 has remained nearly stationary at about 4.4 years since the early 1970s.

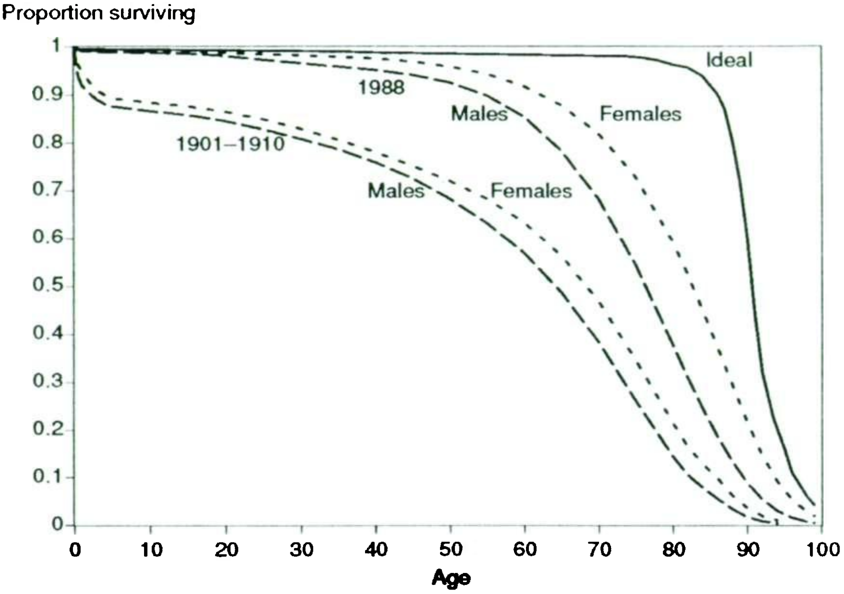
Life expectancy at birth is affected by changes in death rates at all ages, but particularly by changes at young ages. Increases in life expectancy at birth during the first half of the century resulted mainly from reductions in infant and childhood mortality.

While a greater proportion of the Australian population now survives into older age, there is no evidence that there has been any change in the maximum attainable lifespan. This would require a major scientific breakthrough in the slowing of the biological process of ageing. However, we can still look forward to the majority of Australians leading long disability–free lives and dying close to the limit of the average biological lifespan, as represented by the so–called 'rectangular' curve labelled 'Ideal' in Figure 2.1 (Fries and Crapo 1981). The hope is that not only will there be added years of life through reduction in premature mortality, but that quality of life will be improved through a reduction in chronic illness and disability.

Australia has a better average life expectancy at birth than most countries (Figure 2.2, ranking 10th in the world for male and female expectancies combined).

In 1987, Japanese life expectancy exceeded that in Australia by 2.7 years for males and 2.3 years for females, so there is clearly still potential for improvement in Australia.

Figure 2.1: Proportion surviving to a given age, 1901–1910 and 1988



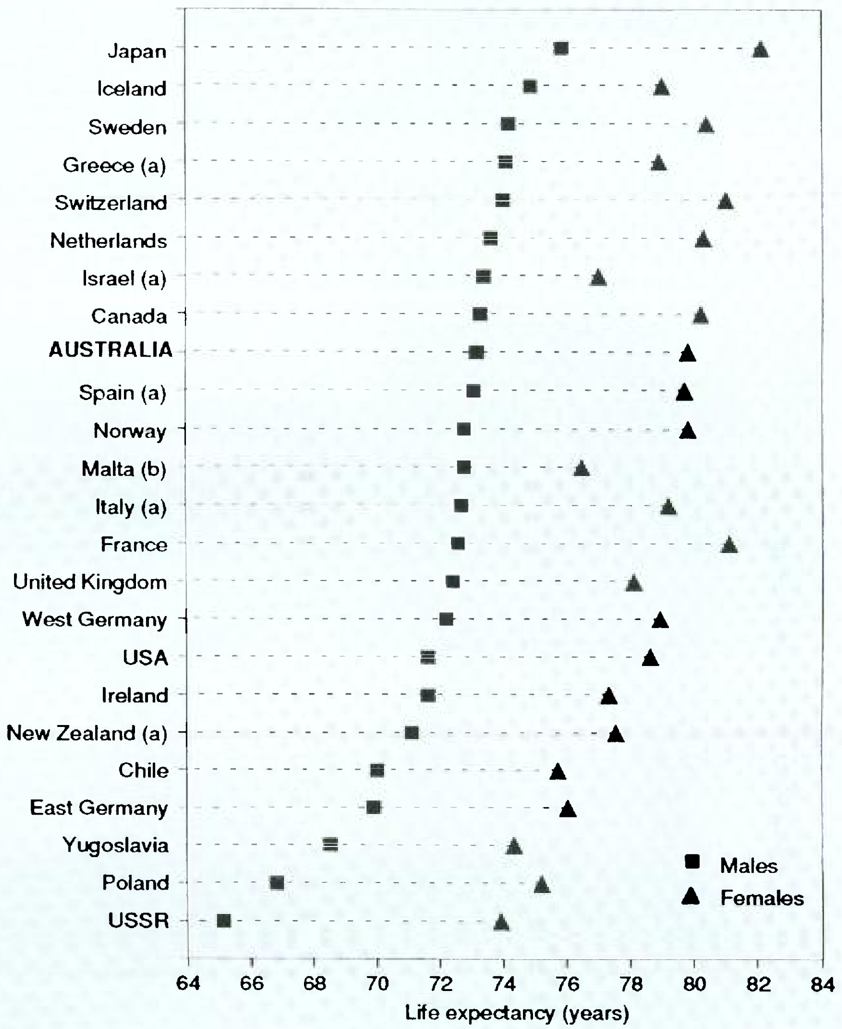
Source: Australian Bureau of Statistics 3101.0; 3302.0

This is further demonstrated by estimates that in 1981–1985 the elimination of all cancer deaths could have added 3.1 and 2.9 years to male and female life expectancies respectively. Similarly, the elimination of all cardiovascular disease could have added 6.9 and 8.0 years (ABS unpublished data).

Life expectancy for males and females in Australia was higher than in both Sweden and the United States in the 1920s (Figure 2.3). In the period since, the gap between the United States and Australia has remained, but Australia was overtaken by Sweden in the 1930s and 1940s. The gap between Swedish and Australian male life expectancy peaked at 4.2 years in the mid 1960s before narrowing to one year in 1987.

Life expectancy in Japan in the first half of the 20th century was much lower than in the other countries included in the comparison. It rose throughout the entire post-war period at a greater rate than in the other countries and did not flatten during the 1960s, overtaking Australia in the 1970s. The trend shows no signs of changing, suggesting that the upper limits of realistically attainable life expectancy have not been reached.

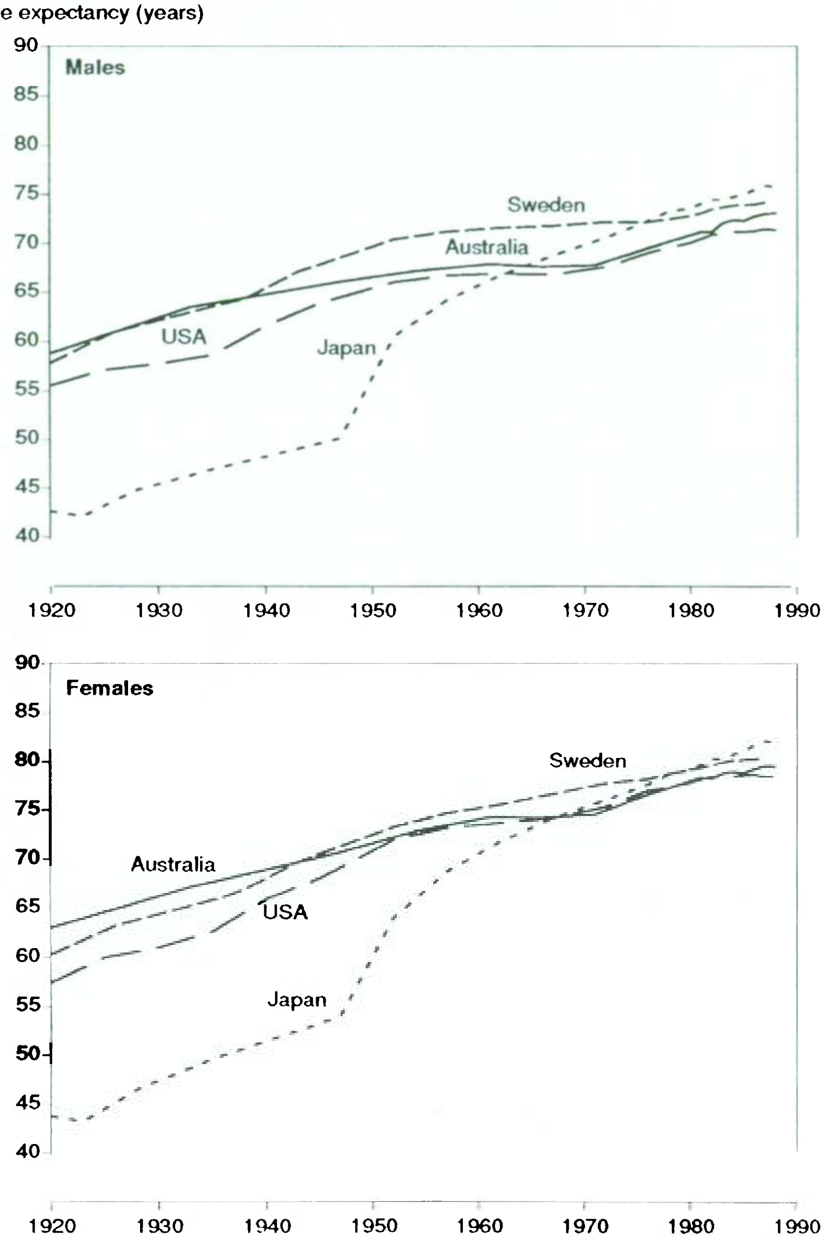
Figure 2.2: Life expectancy at birth, selected countries, 1987



(a) Greece, Israel, Italy and New Zealand 1986, Spain 1985
(b) Malta interpolated from 1986 and 1988

Source: World Health Organization 1988; 1989

Figure 2.3: International trends in life expectancy, 1920 to 1988



Note: Life expectancy at birth, multi–year averages prior to 1975

Source: Australian Bureau of Statistics 3302.0
World Health Organization 1951; 1981 to 1986; 1987a; 1988; 1989
National Center for Health Statistics 1987; 1990
Wilkins 1980

2.2 Death rates

Australia's age standardised death rates halved between 1921 and 1988. In 1921, the male death rate was 1,674 per 100,000 and the female rate was 1,344 per 100,000. By 1988, these rates had fallen to 931 per 100,000 for males and and 550 for females (Figure 2.4).

There have been three phases in the decline in death rates since 1921. There was a consistent decline for both females and males between 1921 and the early 1960s. During the next phase, to the early 1970s, the female rates decreased very slowly while the male rates actually showed small increases at some ages. Since the early 1970s, death rates for both sexes have declined substantially.

A significant factor in reducing death rates between 1921 and the early 1960s was the decline in deaths from infectious and parasitic diseases, particularly among infants and young children. Australia's infant mortality rate fell from 103.6 per thousand live births at the turn of the century to 8.7 per thousand in 1988 (ABS 3302.0). Further reductions are possible: Japan has the world's lowest rate, with 4.8 deaths per thousand live births in 1988 (WHO 1989).

The halt in the decline in death rates during the 1960s was largely because of the impact of cardiovascular disease mortality, which rose until the end of the 1960s for males (and declined very slowly from a 1950s peak for females). During the 1970s there were rapid declines in the male and female rates, which was reflected in the overall death rates for all causes and in increased life expectancies at older ages.

Cardiovascular disease has been the leading cause of death throughout the 20th century, but the proportion of total deaths which it causes has increased dramatically as other causes have declined (Figure 2.5). In 1988, cancers were the second leading cause of death, followed by respiratory diseases.

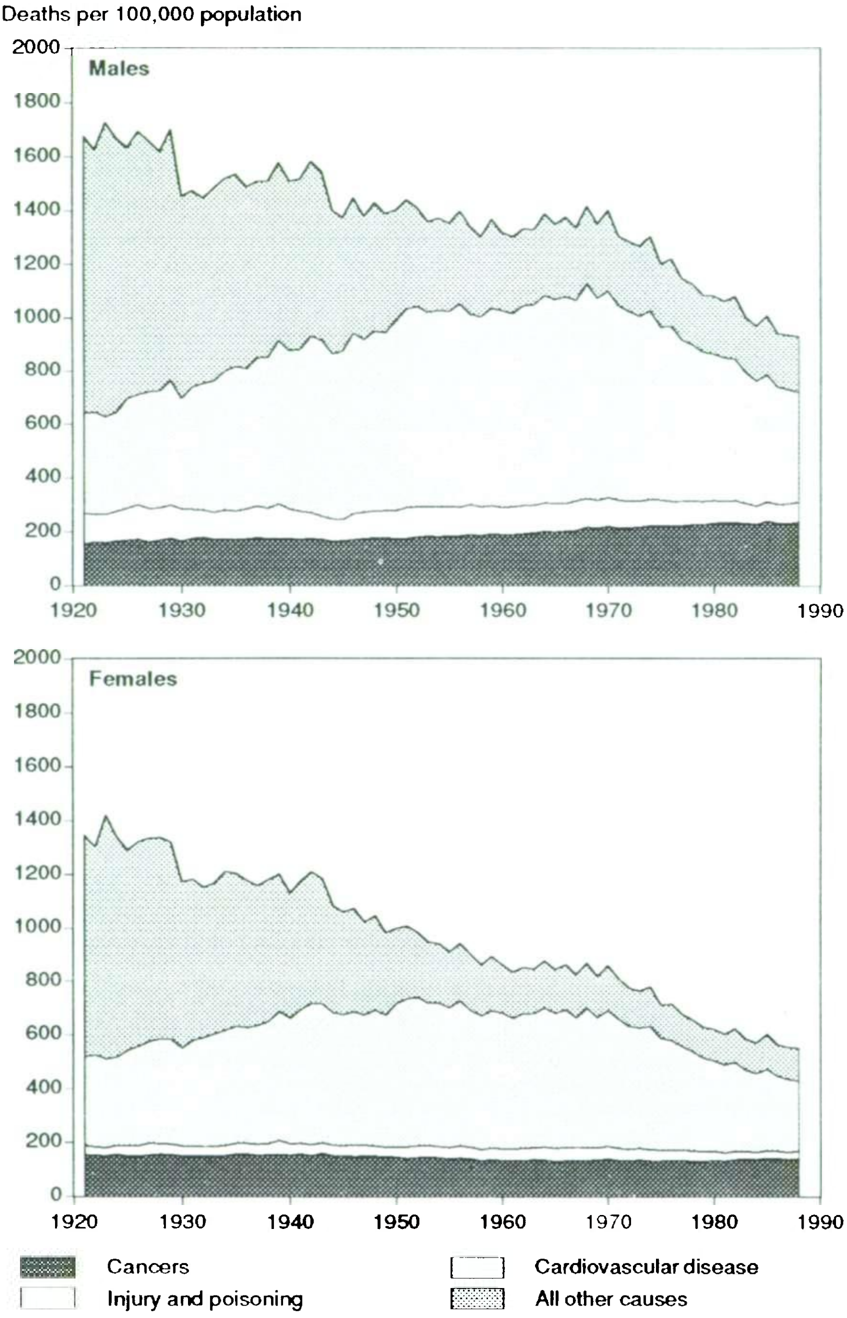
Box 2.4: Death rates

Statistics relating to deaths are often presented as crude death rates (the numbers of deaths in a period divided by the numbers in the relevant population or population sub-group). For example, the 1988 Australian crude death rates were 7.9 per thousand males and 6.6 per thousand females. Since the risk of dying is very different at different ages, crude death rates may change over time because of changes in the age distribution of the population, even if death rates at particular ages (age specific death rates) remain constant.

The age standardised death rate is a summary measure which allows comparison between populations with different age distributions, whether the same population over time or different populations at the same time.

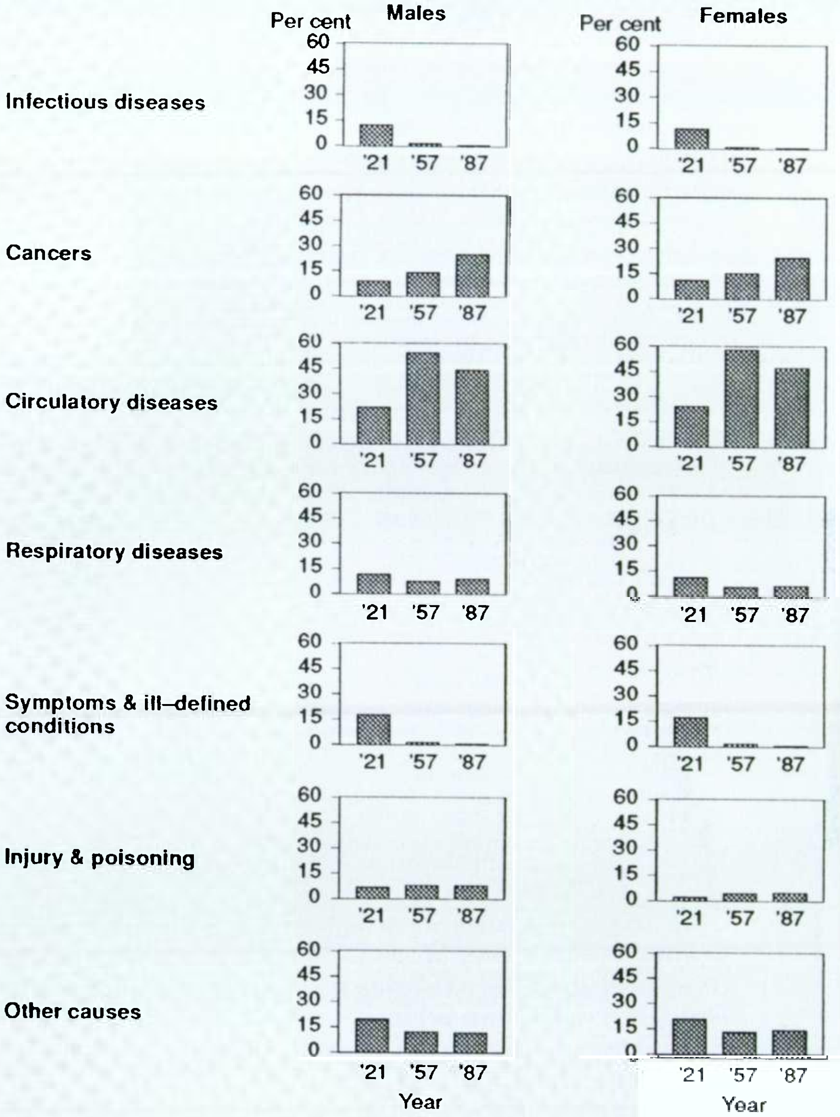
For comparisons of Australian deaths rates over time, rates for males and females have been standardised to the total Australian population as at June 1987 (ABS 3201.0). The WHO European standard population has been used for computing age standardised rates for international comparisons (WHO 1989).

Figure 2.4: Major causes of death, age standardised rates, 1921 to 1988



Source: Australian Institute of Health

Figure 2.5: Distribution of major causes of death, 1921, 1958 and 1988



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

Source: Australian Institute of Health

2.3 Hospitalisation

Some illnesses and accidents rarely result in death, but nevertheless bring about a significant reduction in the quality of life. Hospital statistics can provide information about conditions which generally result in hospitalisation, although they have limitations as indicators of population health status (see Box 2.5).

For every death recorded in Australia, there are 30 hospital admissions and more than 1,000 private doctor services recorded (Table 2.2). As with deaths, the level of hospital admissions rises with age, but much more slowly. The admission rate for people aged 65 and over is about double that of people aged 15–24 years.

There are differences between the distribution of causes of hospital admission and the distribution of causes of death (Table 2.3).

Table 2.2: Death rate, hospital admission rate and doctor visits by age group, 1988

(Per 1,000 population)

Age group	*Death rate*	*Hospital admission rate(a)*	*Doctor visits(b)*
Less than 1	8.7	414	12,970
1–14	0.3	98	5,230
15–34	1.0	195	7,110
35–49	1.8	180	7,950
50–64	8.4	244	10,920
65–74	25.7	376	13,160
75 and over	64.3	548	15,640
All ages	7.2	206	8,310

(a) Estimated separation rate from public, private and repatriation hospitals in 1986.

(b) Private medical services in 1988–89 for which a Medicare benefit was paid.

Source: Australian Bureau of Statistics 3201.0; 3302.0
Mathers and Harvey 1988
Health Insurance Commission 1989
Commonwealth Department of Community Services and Health unpublished

In 1988, the diagnosis category *injury and poisoning* was the leading cause of admission for males, followed by *diseases of the digestive system. Conditions associated with pregnancy and childbirth* were the leading causes of admission for females, followed by *diseases of the genito–urinary system.* A further large proportion of female hospital episodes (10 per cent) was assigned to *investigations and other reasons for hospital admission,* mainly for special investigations and examinations, sterilisation and admission of mothers accompanying sick infants. *Diseases of the respiratory system* were the leading cause of hospitalisation for children 14 years and under, accounting for about 25 per cent of admissions for the age group (Figure 2.6).

In the older age groups, *diseases of the circulatory system, cancers* and *diseases of the digestive system* accounted for the largest numbers of hospital admissions, with older men also being admitted at a higher rate for *diseases of the respiratory system.*

Table 2.3: Hospital admission rate(a) and total death rate(b) by principal diagnosis(c) and sex, most recent years

(Per 1,000 population)

		Admission rate in 1986		*Death rate in 1988*	
ICD-9	*Principal diagnosis*	*Males*	*Females*	*Males*	*Females*
001–139	Infectious/parasitic diseases	3.2	3.6	0.05	0.04
140–239	Neoplasms (cancers)	13.1	13.3	2.06	1.56
240–279	Endocrine, nutritional, metabolic and immunity diseases	1.9	2.8	0.16	0.17
280–289	Blood and blood forming organs	1.4	1.5	0.02	0.03
290–319	Mental disorders	7.8	8.1	0.12	0.12
320–389	Nervous system and sense organs	10.9	11.6	0.13	0.13
390–459	Circulatory system	19.7	16.0	3.36	3.30
460–519	Respiratory system	16.6	13.3	0.68	0.41
520–579	Digestive system	22.3	22.2	0.26	0.24
580–629	Genito-urinary system	10.7	28.7	0.10	0.12
630–676	Pregnancy and childbirth	—	44.9	—	(d)
680–709	Skin and subcutaneous tissue	5.2	4.6	0.01	0.01
710–739	Musculoskeletal system	13.2	12.6	0.03	0.05
740–759	Congenital anomalies	2.3	1.7	0.06	0.05
760–779	Perinatal conditions	2.2	1.8	0.06	0.05
780–799	Symptoms, signs and ill-defined conditions	13.1	14.6	0.06	0.04
800–999	Injury and poisoning	25.5	16.3	0.72	0.30
V01–V82	Investigations and other reasons for hospital admission	17.8	24.1	—	—
Total		**186.9**	**241.6**	**7.88**	**6.61**

(a) Estimated using inpatient separations from public, repatriation and private hospitals in New South Wales, Queensland and Western Australia, the only States for which statistics covering all short-stay hospital admissions are available.

(b) Total death rate for Australian population, not for hospitalised persons only.

(c) Principal diagnosis grouped by ICD-9 Chapters (WHO 1977).

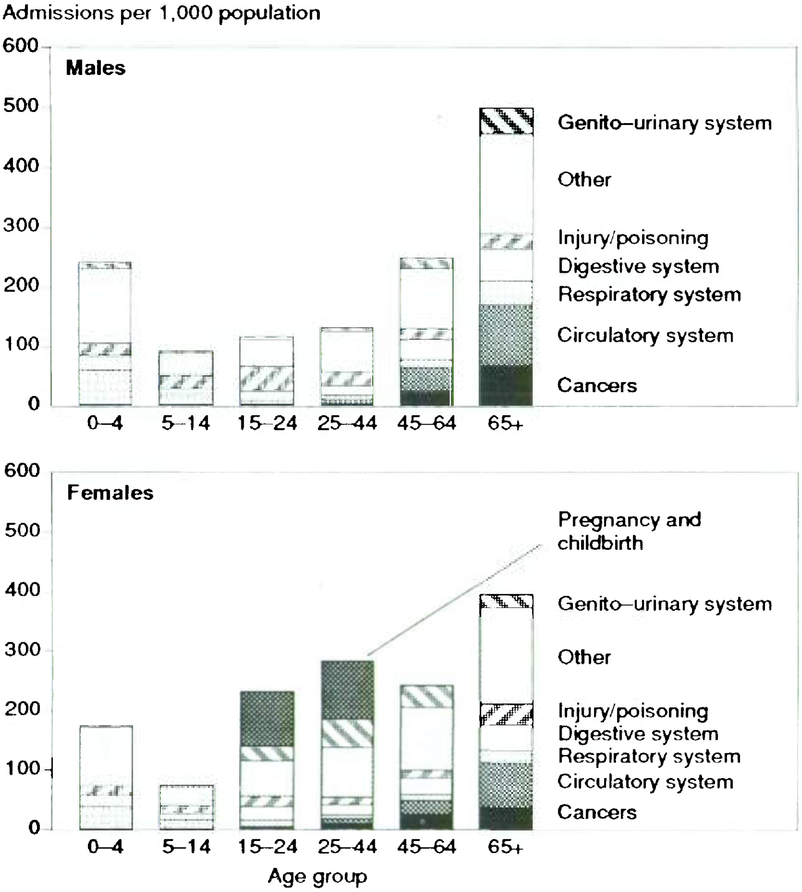
(d) Less than 0.005 per 1,000 population.

Source: Australian Institute of Health.
Australian Bureau of Statistics 3201.0; 3302.0; 4303.3; 4306.1
Health Department of Western Australia 1987

Box 2.5: Measuring hospitalisation

The unit of measurement for illness resulting in hospitalisation is an episode of inpatient care, the period between admission to hospital and separation by discharge, transfer to another institution or death. If the patient is readmitted for further care, another episode occurs. Published admission rates include readmissions and transfers and so do not necessarily provide good estimates of the rates of new illnesses in the population.

Figure 2.6: Hospital(a) admission rates by age and principal diagnosis(b), 1986



(a) Public, private and repatriation hospitals in NSW, Qld and WA.
(b) Principal diagnoses grouped by ICD–9 Chapters (WHO 1977).

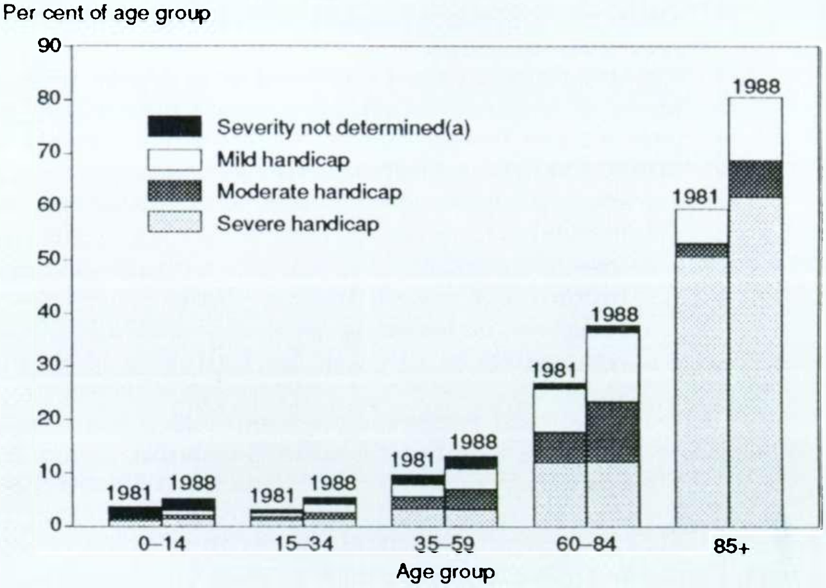
Source: Australian Institute of Health
Australian Bureau of Statistics 4303.3
Health Department of Western Australia 1987

2.4 Disability and handicap

The 1988 Disabled and Aged Persons Survey estimated that almost 16 per cent of Australians (2.5 million people) were disabled in some way (Box 2.6). This included 13 per cent of Australians (2.1 million) classified as handicapped, of whom 657,400 (4 per cent of the population) were classified as severely handicapped (ABS 4118.0).

By comparison, the 1981 Survey of Handicapped Persons estimated that only 13 per cent of the population (1.9 million people) was disabled, including almost 9 per cent (1.3 million) classified as handicapped (ABS 4343.0). Between the two surveys, the number of

Figure 2.7: Prevalence of handicap by severity and age, 1981 and 1988



(a) Comprises all disabled children aged 0–4 years and persons who had a schooling or employment limitation only.

Source: Australian Bureau of Statistics 4118.0

people reported as handicapped increased by 859,400, a 68 per cent increase.

The prevalence of reported handicap rose in all age groups, but most of the increase occurred in the mild or moderate handicap groups (Figure 2.7).

Most of the increase in the prevalence of severe handicap occurred in those aged 85 years and over. Twenty–seven per cent of the increase was a result of changes in the size and age distribution of the population. The same definition of handicap was used in the 1981 and 1988 surveys, but this relied on self–reported assessments, which may change in line with changing community attitudes towards, and perceptions of, disability. This may account for the fact that in 1988, 84 per cent of disabled people reported that they were handicapped, compared with only 65 per cent in 1981.

Box 2.6: Definition of disability and handicap

The 1981 and 1988 ABS surveys used definitions of disability and handicap based on World Health Organization recommendations.

A disabled person is defined as a person who has one or more of a group of selected impairments and disabilities which have lasted, or are likely to last, for six months or more. Examples of disabilities include:

- **loss of sight (even when wearing glasses or contact lenses)**
- **loss of hearing**
- **incomplete use of limbs or digits**
- **slowness at learning or understanding**
- **restriction in physical activities or in doing physical work**
- **long term treatment or medication (but still restricted in some way by the condition being treated)**

A handicapped person is defined as a disabled person aged 5 years or over who is limited to some degree in his/her ability to perform certain tasks in relation to one or more of the following five areas:

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

People under the age of five years with disabilities were all regarded as being handicapped.

People handicapped in any of the self care, mobility and verbal communication areas were further classified into categories of severity as follows:

severe	**personal help or supervision required, or unable to perform one or more tasks relevant to these areas;**
moderate	**no personal help or supervision required, but difficulty experienced;**
mild	**no difficulty in performing tasks, but an aid used or difficulty walking 200 metres or up and down stairs.**

The ABS definitions of handicap and disability do not necessarily match those used in various government assistance programs, for example, eligibility for an invalid pension or nursing home admittance.

The prevalence of severe handicap in the Australian population increases dramatically with age (Figure 2.7). Nevertheless, almost 50 per cent of severely handicapped Australians (326,700 people) are under 65 years. More females than males are classified as severely handicapped in all adult age groups, and the prevalence of severe handicap rises faster with age in females until it is nearly double that of males in the oldest age groups (Table 2.4).

Table 2.4: Prevalence of severe handicap by age group and sex, 1988

	Per cent of population		
Age group	*Males*	*Females*	*Ratio(a)*
5–14	**2.6**	1.9	**0.7**
15–64	**2.3**	**2.7**	**1.2**
65–69	**8.6**	9.0	**1.0**
70–74	**10.7**	14.3	1.3
75–79	**11.7**	22.6	1.9
80–84	**26.2**	36.3	1.4
85 and over	**39.6**	69.6	1.8
All ages	**3.2**	**4.9**	**1.6**

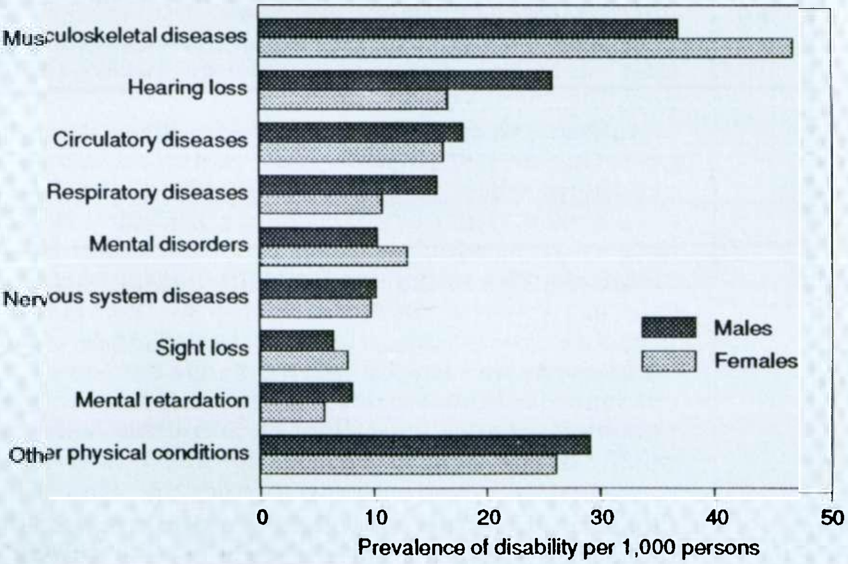
(a) Female rate divided by male rate.

Source: Australian Bureau of Statistics 4118.0 and unpublished

Physical conditions account for the majority of disabilities in both sexes with an overall prevalence in 1988 of 142 per thousand males and 134 per thousand females. Musculoskeletal disabilities and mental disorders, unlike most other conditions, are more commonly cited as disabling conditions by females than males (Figure 2.8).

Only a small proportion of people reporting a disability or handicap receive a disability pension. The Commonwealth Department of Social Security paid disability benefits to 436,000 people (3 per cent of Australians aged 65 and under) in the 1987–88 financial year (Table 2.5). This did not include people with disability or handicap receiving the old age pension, sickness benefits, special benefits or unemployment benefits. The number of people receiving disability benefits varies with legislative and administrative changes and so provides at best a partial indicator of the prevalence of disability.

Figure 2.8: Primary disabling conditions, 1988



Source: Australian Bureau of Statistics 4118.0

Table 2.5: Pensioners receiving Commonwealth disability benefits, by type of benefit, 1987–88

(Number)

Type of benefit	*Recipients*
Invalid pension	388,886
Child disability allowance	33,850
Sheltered employment allowance	10,669
Rehabilitation allowance	2,629
Total	**436,034**

Source: Commonwealth Department of Social Security 1988

2.5 Congenital malformations

Between 1981 and 1987, 22,730 malformed fetuses and infants, or 1.5 per cent of all births, were notified to the National Perinatal Statistics Unit national monitoring system (NPSU 1989). From 1981 to 1985, the trend in single and total malformations was consistently downward but there were increases in 1986 and again in 1987, and the rates are now higher than in 1981 (Figure 2.9).

The highest reported malformation rates in 1987 were in Queensland and South Australia and the lowest in the Australian Capital Territory (Figure 2.10). Differences in notification sources, and variable reporting of relatively common malformations such as congenital dislocation of the hip, account for much of the variation among States.

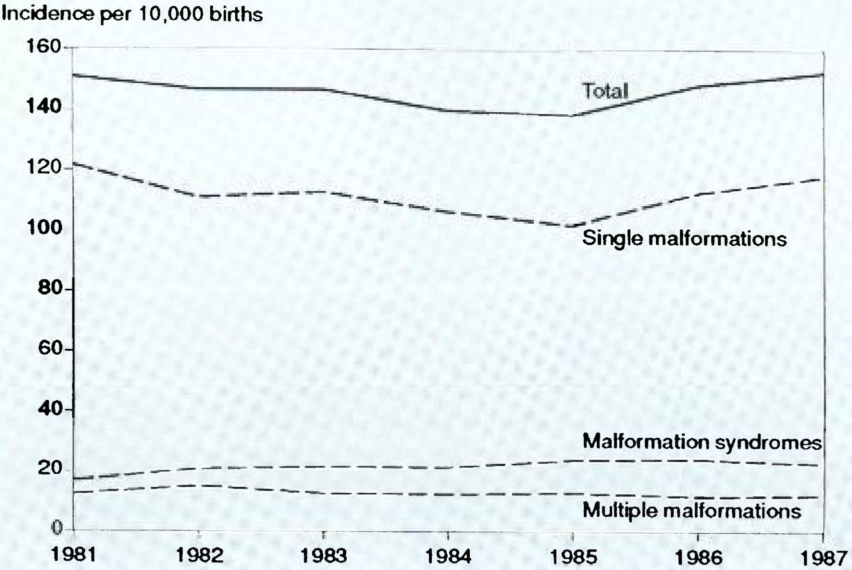
Box 2.7: Monitoring congenital malformations

National monitoring of congenital malformations is undertaken by the AIH National Perinatal Statistics Unit at the University of Sydney. This began in 1981 with data notified to the NPSU by some States. All States and Territories have now developed perinatal data systems so that national monitoring of malformations has been possible for several years.

Malformed fetuses and infants of at least 20 weeks' gestation or 400g birthweight, as well as induced abortions occurring after prenatal diagnosis of malformations or chromosomal abnormalities, are included in the national data system, which relies primarily on data from obstetric hospitals. The upper age limit for diagnosis is usually about 5–7 days when most infants are discharged from the hospital of birth, but chromosomal abnormalities diagnosed up to 12 months of age are notified by cytogenetic laboratories. Other sources of information are perinatal death certificates, children's hospitals and notifications of induced abortions.

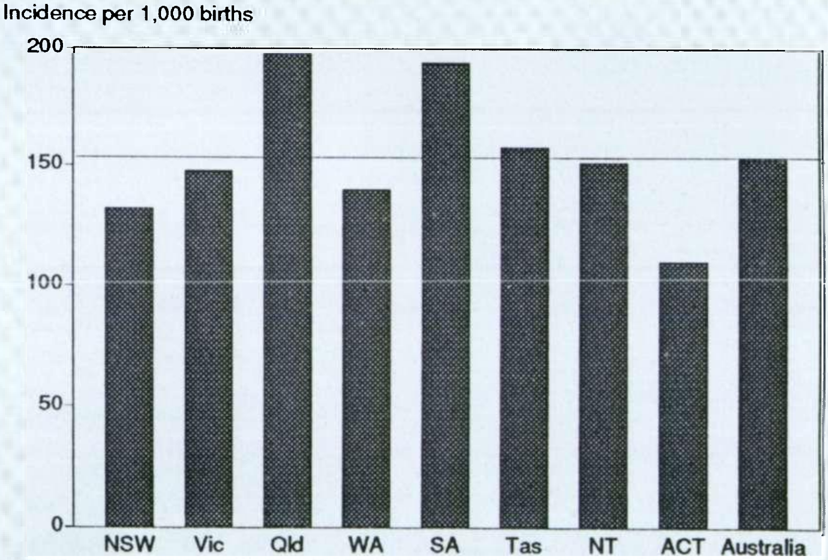
Australian data are reported to the International Clearinghouse for Birth Defects Monitoring Systems, and trends in Australia are compared with similar data from more than 20 other monitoring programs around the world.

Figure 2.9: Malformed fetuses and infants, incidence rates, 1981 to 1987



Source: Australian Institute of Health National Perinatal Statistics Unit 1989

Figure 2.10: Malformed fetuses and infants, incidence rates, States and Territories,1987



Source: Australian Institute of Health National Perinatal Statistics Unit 1989

Malformations of the musculoskeletal and cardiovascular systems and the genital organs were the most commonly reported groups (Table 2.6). Rates for some selected specific major malformations in 1987 are shown in Table 2.7.

Table 2.6: Incidence of congenital malformations by major anatomical group, 1987

		Fetuses and infants	
ICD-9	*Anatomical group*	*Number*	*Rate per 10,000 births(a)*
740–742	Nervous system	460	18.7
743	Eye	79	3.2
744	Ear, face and neck	24	1.0
745–746	Heart	699	28.5
747	Circulatory system	254	10.4
748	Respiratory system	60	2.4
749	Cleft palate and/or lip	362	14.8
750–751	Digestive system	305	12.4
752	Genital organs	588	24.0
753	Urinary system	294	12.0
755	Limbs	344	14.0
754, 756	Other musculoskeletal	845	34.4
757	Integument	28	1.1
758	Chromosomal	484	19.7
759	Other and unspecified	82	3.3

(a) Based on 245,391 births in 1987.

Source: Australian Institute of Health National Perinatal Statistics Unit 1989

Table 2.7: Incidence of selected major congenital malformations, 1987

		Fetuses and infants	
ICD-9	*Congenital malformation*	*Number*	*Rate per 10,000 births(a)*
740	Anencephalus	93	3.8
741	Spina bifida	177	7.2
742.3	Hydrocephalus	88	3.6
745.1	Transposition of great vessels	95	3.9
745.4	Ventricular septal defect	362	14.8
749.0	Cleft palate	128	5.2
749.1,2	Cleft lip and cleft palate	234	9.6
750.3	Tracheo–oesophageal fistula, oesophagealatresia, etc	88	3.6
751.2	Atresia or stenosis of large intestine, rectum and anus	99	4.0
752.6	Hypospadias	453	18.5
753.0	Renal agenesis, dysgenesis	90	3.7
754.3	Congenital dislocation of hip	510	20.8
758.0	Down's syndrome	297	12.1

(a) Based on 245,391 births in 1987.

Source: Australian Institute of Health National Perinatal Statistics Unit 1989

2.6 Dental health

There have been marked improvements in the dental health of Australians over the past 20 to 30 years, especially among children. However, the prevalence of dental and periodontal disorders is still high in some sections of the population, particularly among older people.

2.6.1 Dental health status

A substantial decline in the extent and severity of dental decay among Australian children has occurred (Spencer et al 1989; Carr 1985).

The Australian Child Dental Health Survey has collected data on the dental health status of schoolchildren examined by the State and Territory school dental services since 1977. Data on the dental caries experience of year of birth cohorts identified from the survey reveal a number of temporal trends in dental disease.

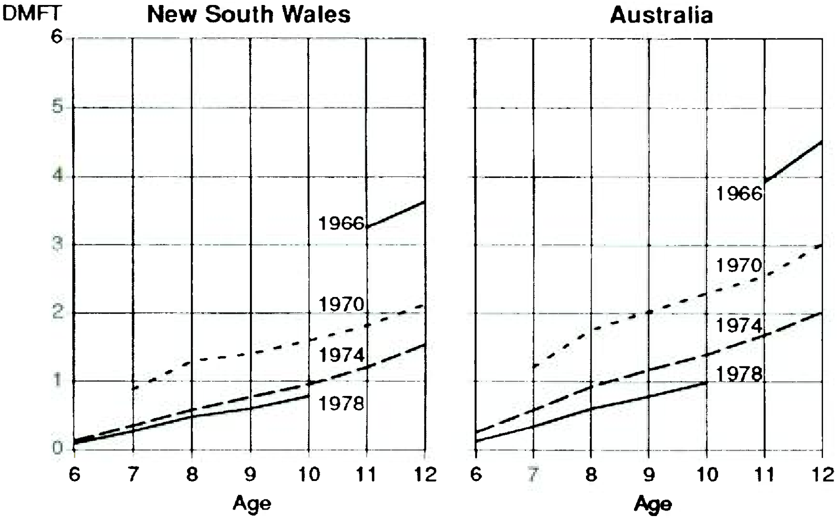
The dental caries experience (measured as the DMFT—Box 2.8) of children born in 1966, 1970, 1974 and 1978 in New South Wales and all Australia is shown in Figure 2.11. At corresponding ages, the earlier the year of birth the greater the DMFT prevalence (indicated by the higher position of the lines) and the higher the annual incidence of caries (DMFT increment—indicated by the slope of the lines).

The rate of decline is diminishing—the differences between the 1978 and 1974 cohorts are smaller than those between the 1970 and 1966 cohorts. The South Australian data have been examined using a linear regression model (Slade, Spencer and Dooland 1989) which projects a levelling of the decline early next century, before which the Health for All target of 1.0 DMFT for 12–year–olds is likely to be achieved (Health Targets and Implementation Committee 1988). Geographical differences also appear to be diminishing. Marked differences between New South Wales and Australian children in the earlier cohorts are now substantially less. In South Australia, a similar convergence may be seen between cohorts in Adelaide and the rest of the State (Figure 2.12).

Box 2.8: DMFT index

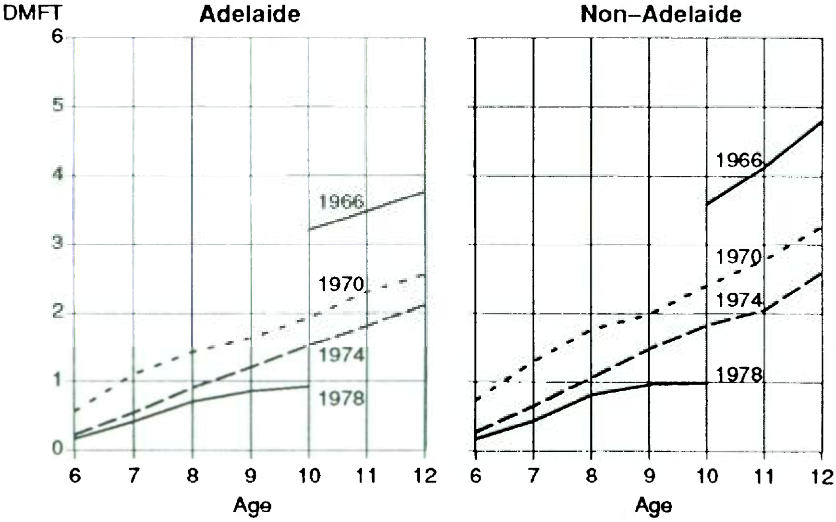
The status of the permanent teeth of dentate people (those with one or more natural teeth) is summarised in the DMFT index. The index is a measure of dental decay experience, and is assessed by counting the number of decayed, missing or filled permanent teeth. The most recent convention for constructing the 'M' (missing) component of the index (WHO 1987b) is used. For people under 30, extractions for decay contribute to the index, but extractions for other reasons do not. For older people, all missing teeth (regardless of the reason for extraction) are included.

Figure 2.11: Cohort changes in decayed, missing and filled permanent teeth in schoolchildren, NSW and Australia, 1977 to 1988



Source: Commonwealth Department of Health 1987
South Australia Dental Service unpublished

Figure 2.12: Cohort changes in decayed, missing and filled permanent teeth in schoolchildren, SA: Adelaide and non-Adelaide, 1976 to 1988



Source: Commonwealth Department of Health 1987
South Australian Dental Service unpublished

Box 2.9: Dental health surveys

The 1987-88 National Oral Health Survey of Australia was the first representative national oral health survey. It was conducted jointly by the Commonwealth and the States and Territories. The Commonwealth was responsible for the planning and coordination of the survey and the processing of data, and the States and Territories were responsible for the conduct of the survey in accordance with agreed methodology.

The ABS selected a representative sample of households, identifying 2,500 potential participants for each State and Territory. Members of each selected household were approached to participate. Times were scheduled for interviews with ABS interviewers and home dental examinations by dentists who volunteered their time. Some 16,897 people aged five years and over were interviewed and 14,430 were also examined.

One unanswered question concerns the distribution of children's dental caries among different socioeconomic groups. There would clearly be value in examining any trends over time in the association between socioeconomic status and DMFT, and recent modifications to the Child Dental Health Survey should provide a greater opportunity for future investigations of this nature (Chapter 8).

There are marked differences with age in the prevalence of edentulism, the loss of all natural teeth (Table 2.8). Less than 1 per cent of people aged 30 years have lost all natural teeth compared with about half of those over 65.

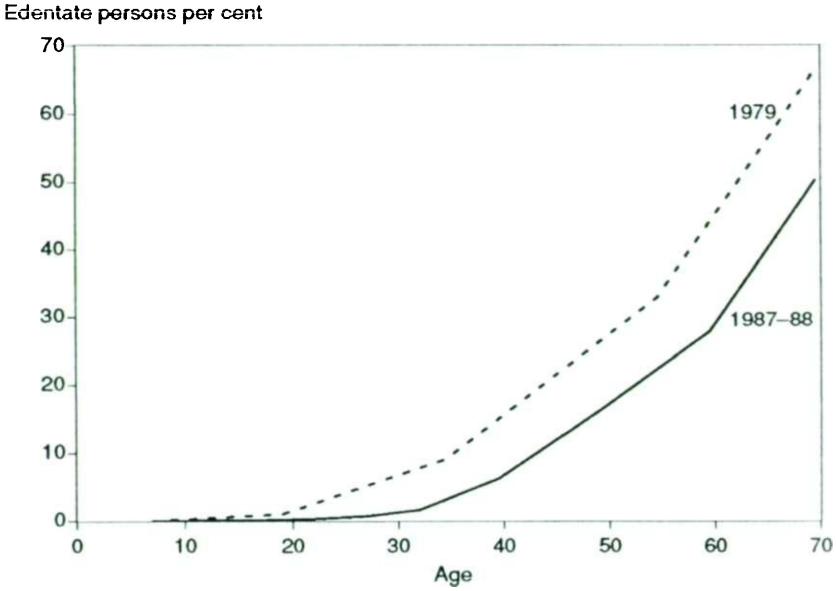
These same data, together with the findings from a 1979 Survey (ABS 4339.0), show that the prevalence of edentulism has declined in all age groups, particularly among those 65 and over (Figure 2.13). In 1979, 66 per cent of this age group had lost all their teeth. This was 16 per cent higher than the 1987–88 figure.

Table 2.8: Prevalence of edentulism by age group

	(Per cent)
Age group	*Edentate persons*
5–9	0.0
10–14	0.0
15–19	0.1
20–24	0.3
25–29	0.7
30–34	1.6
35–44	6.2
45–54	16.7
55–64	27.8
65 and over	50.2

Source: National Oral Health Survey 1987–88 unpublished (see Box 2.9)

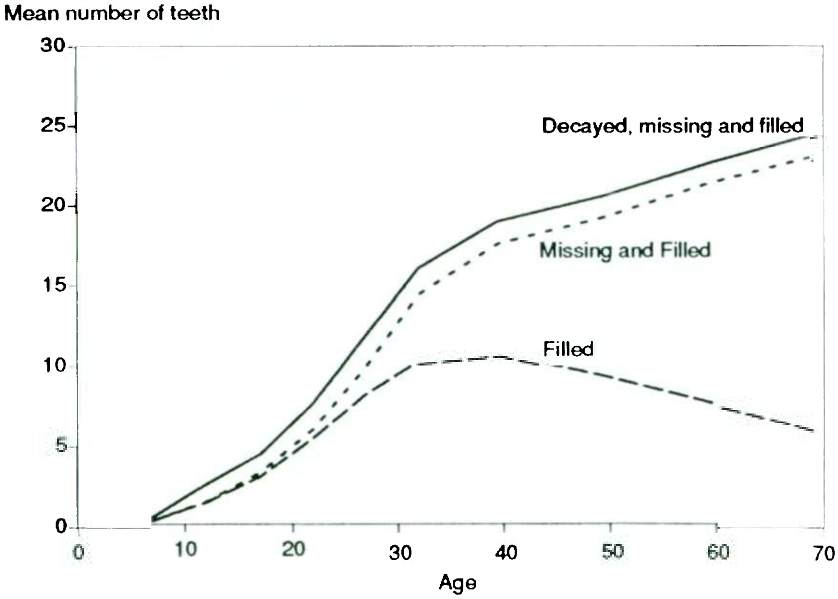
Figure 2.13: Prevalence of edentulism(a), 1979 and 1987–88



(a) No natural permanent teeth

Source: Australian Bureau of Statistics 4339.0
National Oral Health Survey 1987–88 unpublished

Figure 2.14: Decayed, missing and filled teeth for dentate(a) persons, mean number, 1987–88



(a) One or more natural permanent teeth

Source: National Oral Health Survey 1987–88 unpublished

In dentate people the total mean DMFT index increases across age groups to a mean level of 24.3 at 65 and over (Figure 2.14). There are also differences in the components of the index among age groups. Below age 25, the dental decay experience is almost exclusively represented by filled and decayed teeth. Above age 25, the number of missing teeth starts to become significant, and above the age of 35 the mean number of filled teeth reduces while the mean number of missing teeth increases. The mean number of decayed teeth is relatively constant in all adult age groups, ranging from 2.0 in those aged 25–29 years to 1.3 in people aged 55–64.

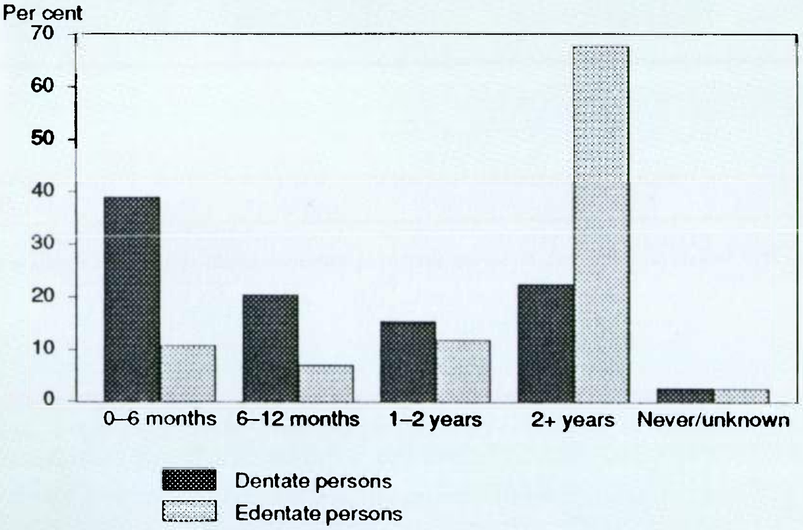
2.6.2 Use of dental services

Age specific utilisation rates which fail to control for dentition status appear to demonstrate a marked reduction in utilisation among older age groups. However, this is entirely a result of the lack of utilisation by the edentate.

The period since the most recent dental visit differs markedly between dentate and edentate people (Figure 2.15). Nearly 60 per cent of dentate people reported a visit for dental care within the previous year, compared with only about 18 per cent of edentate people. 68 per cent of edentate people had last attended two or more years before.

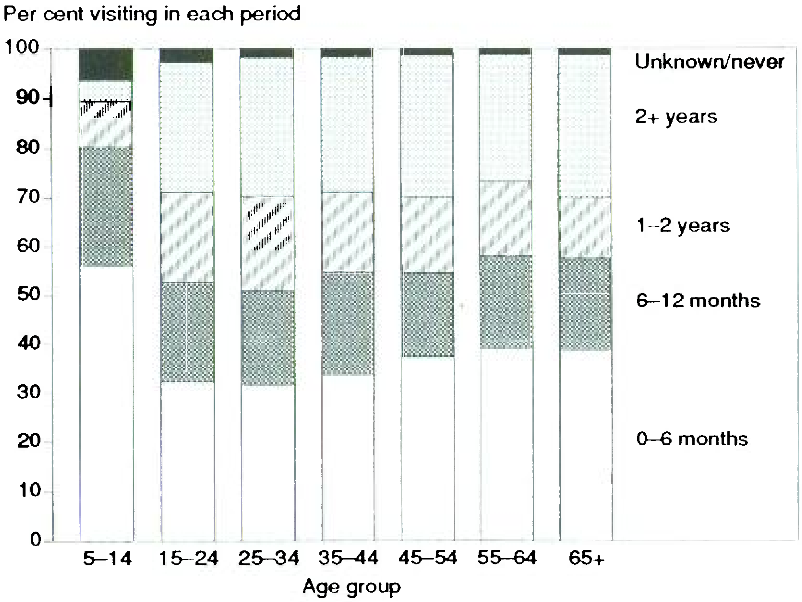
Among the dentate, children aged 5–14 years use dental services most frequently, with 80 per cent of them visiting within the previous year, and 56 per cent visiting within the previous six months (Figure 2.16). The percentage of dentate adults who visited a dentist within the previous year is relatively constant across age groups, ranging from 51 per cent among those aged 25 to 34 years, to 58 per cent for those aged 55 to 64.

Figure 2.15: Period since last dental visit, dentate and edentate persons, 1987–88



Source: National Oral Health Survey 1987–88 unpublished

Figure 2.16: Period since last dental visit, dentate persons by age, 1987–88



Source: National Oral Health Survey 1987–88 unpublished

The Australian experience of increasing numbers of older people retaining their teeth, and both tooth decay and the use of dental services remaining relatively constant throughout adulthood, reflects the experience in other comparable countries. These findings suggest also that future requirements for and use of dental services by adults are likely to increase, particularly among those aged 65 and over (Section .

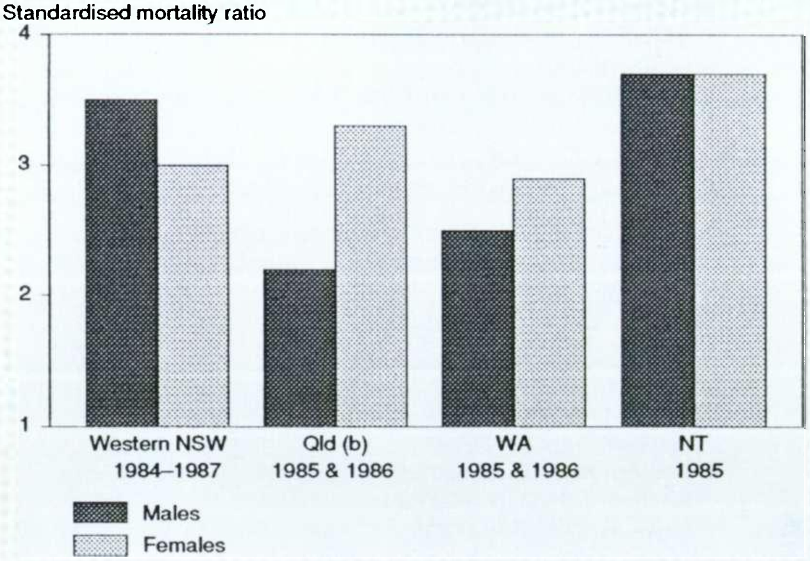
2.7 Health differentials

Overall, Australia has one of the healthiest populations in the world but there are significant disparities in the health status of different groups in Australia. The most significant disparities are between Aboriginal and non-Aboriginal Australians. The next most significant differences are between Australians in low and high socioeconomic status (SES) groups.

2.7.1 Australian Aborigines and Torres Strait Islanders

The descendants of the original inhabitants of Australia have not shared in the recent marked improvements in mortality in Australia, and their health remains substantially worse than that of other Australians. Their level of mortality is between two and four times that of the total Australian population (Figure 2.17) and their life expectancy is 12 to 20 years less than that of other Australians.

Figure 2.17: Standardised mortality ratio(a), Aborigines compared with total Australian population



(a) Ratio of age standardised death rate for Aborigines to age standardised death rate for the total Australian population
(b) Aboriginal reserve communities

Source: Gray and Hogg 1989
Queensland Department of Health unpublished
Health Department of Western Australia unpublished
Northern Territory Department of Health and Community Services unpublished
Australian Bureau of Statistics 3302.0

For males, available estimates of life expectancy range from 53 years for Aboriginal people living in the Northern Territory in 1985 to 61 years for those living in the Kimberley region of Western Australia in 1983–1984 (Table 2.9). For females, estimates range from 58 years for Queensland communities in 1985–1986 to 65 years for the western areas of New South Wales in 1984–1987 (Gray and Hogg 1989). Even the highest estimates were well below those of the total Australian population in 1988: 73 years for males and almost 80 years for females (ABS 3302.0).

Internationally, the expectation of life at birth for Aborigines and Torres Strait Islanders is comparable with levels reported for India, Indonesia, Haiti and Kenya (Figure 2.18).

On the basis of these estimates, less than one–third of Aboriginal or Torres Strait Islander males can expect to live to their 65th birthday, compared with more than three–quarters of all Australian males. Less than half of Aboriginal or Torres Strait Islander females can expect to live to 65, compared with nearly nine out of ten of all Australian females.

Despite substantial improvements during the 1970s, Aboriginal and Torres Strait Islander infant mortality remains much higher than that of the total Australian population. The rates for Aborigines and

Torres Strait Islanders living in Queensland communities and in Western Australia are between 2 and 2.5 times that of the total Australian population (Table 2.10). In the Northern Territory, the mortality rate in 1985–1987 was almost four times that of the total Australian population, and there has been no significant change since the late 1970s.

In 1985, death rates for Aborigines and Torres Strait Islanders living in the Queensland communities, Western Australia and the Northern Territory, exceeded those of the total Australian population for all ICD9 Chapter groupings of causes of death (Figure 2.19).

Table 2.9: Life expectancy of Aborigines by sex, selected regions, most recent years

	(Years)	
Region	*Male*	*Female*
Aborigines		
Western New South Wales, 1984–1987	53.5	64.8
Queensland(a), 1985–1986	56.2	57.8
Western Australia, 1985–1986	55.2	61.9
Kimberley, Western Australia, 1983–1984	60.8	64.2
Northern Territory, 1985	53.0	63.0
Total Australian population, 1986	72.8	79.1

(a) Aboriginal reserve communities (see Glossary).

Sources: Gray and Hogg 1989
Holman and Quadros 1986
Queensland Department of Health unpublished
Health Department of Western Australia unpublished
Northern Territory Department of Health and Community Services unpublished
Australian Bureau of Statistics 3302.0

Table 2.10: Aboriginal infant mortality rate(a), 1973–1975 to 1985–1987

	Infant mortality rate(a)				*Aboriginal/total population rate ratios(b)*		
	Aborigines						
Triennium	*Qld(c)*	*WA*	*NT*	*Australia*	*Qld*	*WA*	*NT*
1973–1975	78.8	n.a	61.7	15.7	5.0	na	3.9
1976–1978	56.1	n.a	58.4	12.8	4.4	na	4.5
1979–1981	27.4	24.7	36.8	10.7	2.6	2.3	3.5
1982–1984	28.6	24.8	32.9	9.7	2.9	2.6	3.4
1985–1987	18.2	22.9	35.5	9.1	2.0	2.5	3.9

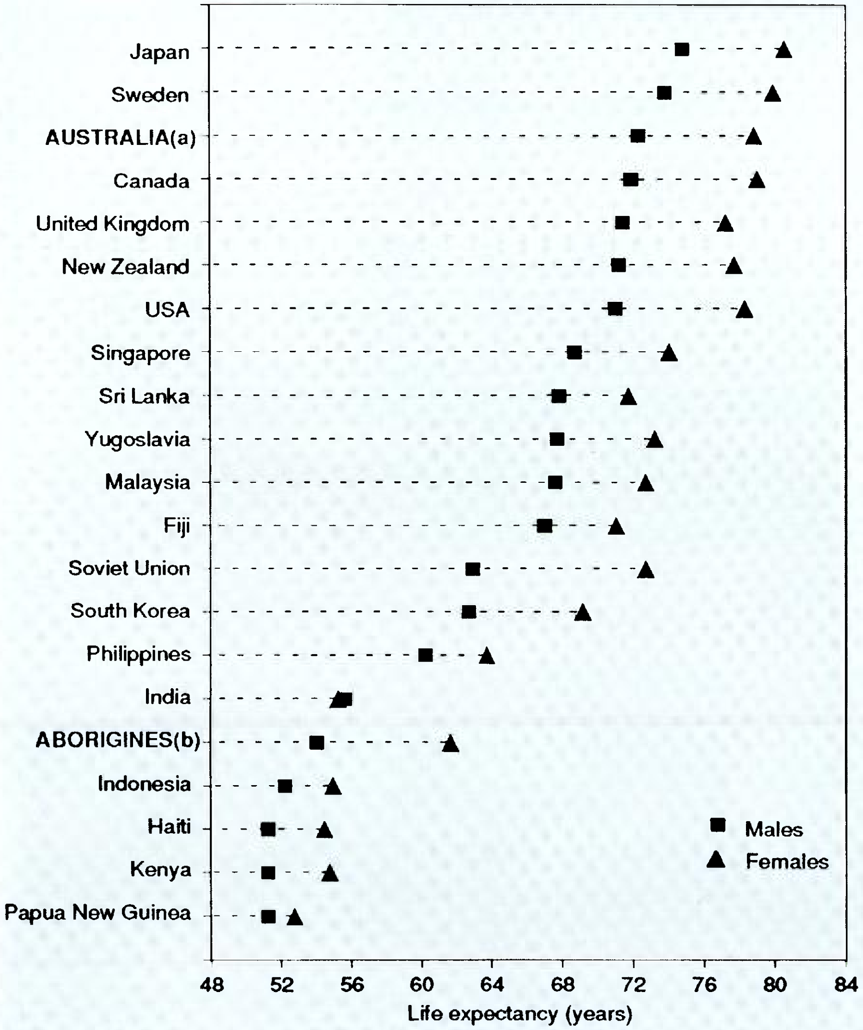
(a) Infant deaths per 1,000 live births.

(b) The ratio of the infant mortality rate for Aborigines to the infant mortality rate for the total population.

(c) Aboriginal reserve communities.

Sources: Queensland Department of Health unpublished
Health Department of Western Australia unpublished
Northern Territory Department of Health and Community Services unpublished
Australian Bureau of Statistics 3302.0, 3304.0

Figure 2.18: Life expectancy at birth for Aborigines and selected countries, 1985

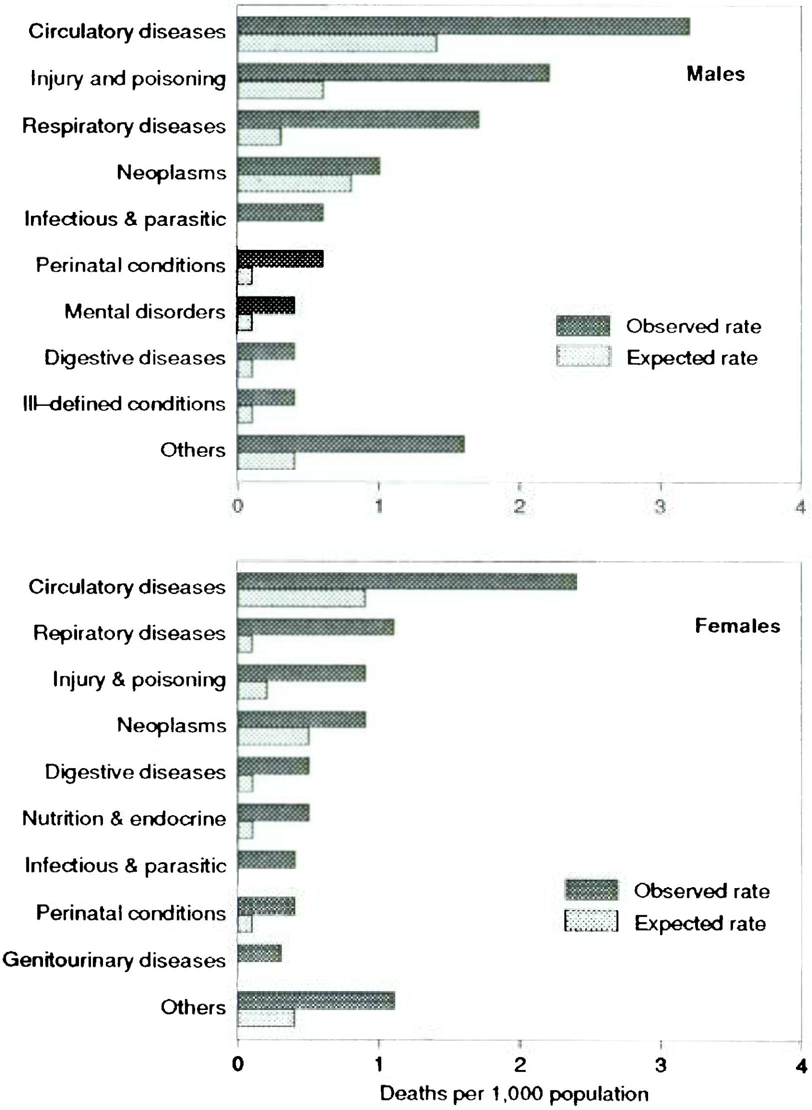


(a) Includes Aborigines and Torres Strait Islanders
(b) Includes Torres Strait Islanders

Source: United Nations 1987
Australian Bureau of Statistics 3302.0

The leading cause of death for both male and female Aborigines and Torres Strait Islanders was diseases of the circulatory system (including heart disease and stroke). In 1985, Aboriginal or Torres Strait Islander death rates due to diseases of the circulatory system were 2.2 and 2.6 times higher than the age-adjusted Australian rates, while for young and middle-aged adult Aborigines and Torres Strait Islanders, they were between 10 and 20 times higher.

Figure 2.19: Deaths of Aborigines by cause, observed(a) and expected(b) rates, 1985



(a) The observed rates represent the combined data for Aborigines of the Queensland reserve communities, Western Australia, South Australia, and the Northern Territory.

(b) The expected rates are the mortality rates for the total Australian population applied to the Aboriginal population.

Source: Queensland Department of Health unpublished
Health Department of Western Australia unpublished
Northern Territory Department of Health and Community Services unpublished
Australian Bureau of Statistics 3302.0

For Aborigines and Torres Strait Islanders in general, as for other Australians, deaths from circulatory system disease are predominantly because of degenerative conditions such as ischemic heart disease and cerebrovascular disease.

However, for those in the more remote areas of Australia, there are also still a number of deaths due to acute rheumatic fever and chronic rheumatic heart disease: these results of infection in childhood are uncommon causes of death for other Australians. This highlights the complexity of Aboriginal and Torres Strait Islander health disadvantages: they experience high levels of diseases characteristic of developed countries as well as those, such as infectious diseases and their sequelae, common only in developing countries.

Injury and poisoning is the second most frequent cause of death for Aboriginal and Torres Strait Islander males and the third most common (after respiratory diseases) for females. In 1985, the death rate from injuries for Aborigines and Torres Strait Islanders was 3.6 times higher for males than in the general population and 4.3 times for females. For both males and females, motor vehicle accidents and injuries purposefully inflicted by others were the main causes of fatal injuries among Aborigines and Torres Strait Islanders. In the Northern Territory the Aboriginal death rate from injuries inflicted by others was close to 27 times that of the general population between 1977 and 1982 (Devanesen et al 1986).

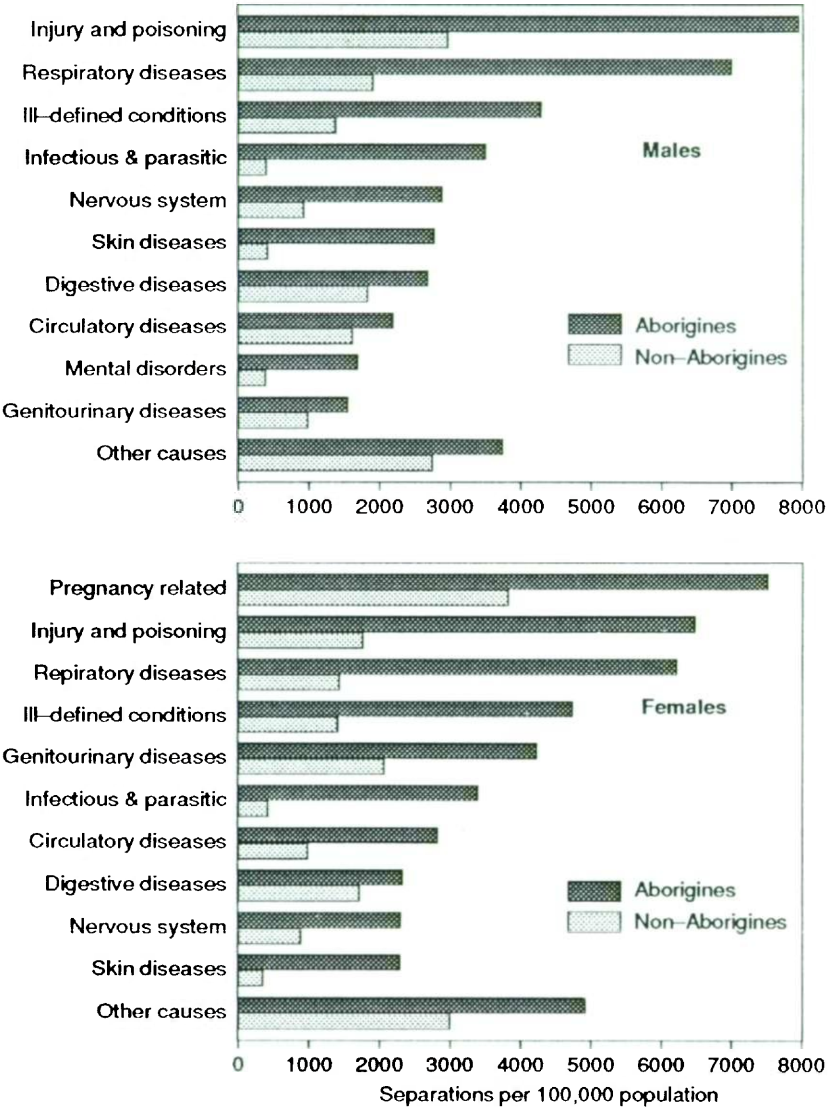
The overall hospital admission rates of Aborigines or Torres Strait Islanders are 2.5 to 3 times those of the rest of the population, with higher rates in every age group and for every cause at ICD9 Chapter level (Figure 2.20). Unlike the rest of the population, where the highest hospitalisation rates are among older people, the rates for Aborigines and Torres Strait Islanders are highest among infants and young children. The highest rate ratios are in the 0–4 age group at 3.9 for males and 4.8 for females, with the next highest among young and middle aged adults (3.7 for males aged 35–44 years and 3.8 for females aged 45–54 years).

Excluding pregnancy–related admissions, injury and poisoning is the leading cause of hospitalisation among Aborigines and Torres Strait Islanders, for both males and females. For males, the age standardised admission rate for Aborigines and Torres Strait Islanders was 2.7 times that of the general population (Figure 2.20). For females, the age standardised admission rate was 3.7 times higher. The leading causes of injury resulting in hospitalisation were assault, traffic accidents, and burns and scalds.

Respiratory disease is the next most common reason for Aborigines and Torres Strait Islanders being admitted to hospital. Their admission rate for respiratory disease is 3.7 times higher than for the rest of the population for males and 4.4 times higher for females. Pneumonia and other infectious respiratory diseases are significantly more common among Aboriginal and Torres Strait Islander people, and levels of chronic respiratory disease are also higher.

For hospitalisation, the ratio of inequality between Aborigines and Torres Strait Islanders and the general population is greatest in the case of infectious and parasitic diseases, where the admission rates are 9 times higher for males and 8.3 times for females.

Figure 2.20: Hospital separations for Aborigines and non–Aborigines, age standardised rates by principal diagnosis, 1986



Note: Figures for both Aborigines and non–Aborigines represent the combined data for Western Australia, South Australia, and the Northern Territory.
Northern Territory data are for 1984.

Source: Health Department of Western Australia unpublished
South Australian Health Commission unpublished
Northern Territory Department of Health and Community Services unpublished

2.7.2 Socioeconomic disadvantaged

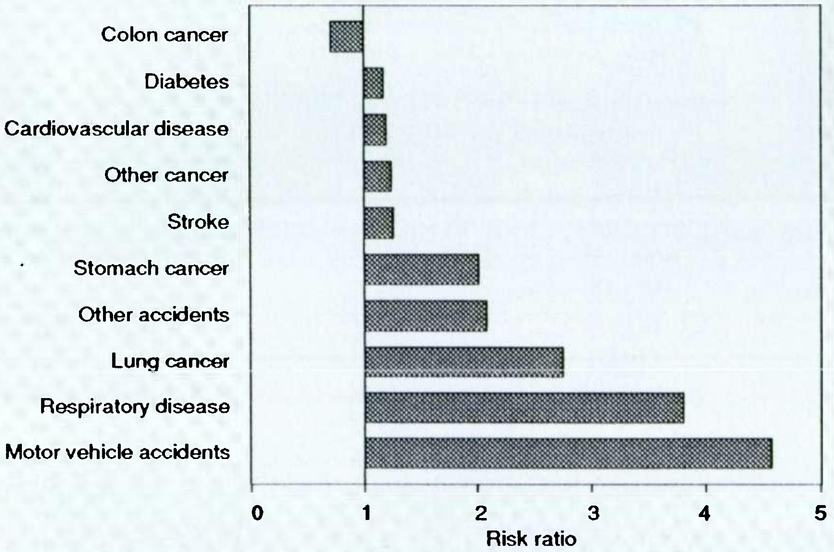
As the Health Targets and Implementation Committee (1988) observed, socioeconomic status dominates any other explanation of the variance in health in a given population.

A variety of indicators has been used to establish socioeconomic status, for example, income, education, occupation or employment status. But whichever measure is used, the socioeconomically disadvantaged have higher death rates than the socioeconomically advantaged for all major causes of death (Figure 2.21). For example, in the 1970s males in the lowest socioeconomic group had 1.3 times the rate of heart disease and stroke and 2.8 times the rate of bronchitis, emphysema and asthma of those in the highest socioeconomic group. Only colon cancer and the relatively rare brain cancers show a higher incidence in men of higher socioeconomic status (McMichael 1985; Baumann 1989).

Ischemic heart disease death rates for both males and females in Australia have declined at a greater rate in higher SES groups than in lower SES groups as measured by broad occupational grouping (Gibberd et al 1984; Dobson et al 1985). The differential between low and high SES groups has thus widened in Australia.

Risk factor surveys by the National Heart Foundation (1980; 1983) have found that lower SES groups have higher levels of high blood pressure and smoking, and are more often overweight than higher

Figure 2.21: Social class risk ratio(a) for selected causes of death, males, 1970



(a) Ratio of age standardised death rate for lowest social class to age standardised death rate for highest social class. Social class defined by using Congalton 4–point scale classification of occupation.

Source: McMichael 1985

SES groups. This could explain much of the difference in death rates, particularly for cardiovascular diseases and some cancers. In addition, environmental, occupational and social inequalities almost certainly contribute to these differentials.

Reduction of health inequalities between the advantaged and disadvantaged is a major goal of the National Better Health Program (see Chapter 4).

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3 Today's epidemics

The major diseases affecting developed societies such as Australia are no longer the infectious diseases, but those associated with lifestyle and related social and environmental factors. Several categories of disease warrant closer examination because a substantial proportion of deaths from these causes could be prevented.

3.1 Today's epidemics: injury and poisoning

Each year, as a result of injuries, one in 2,000 Australians dies, one in 50 is admitted to hospital, and more than one in two visit private doctors (Table 3.1). For every fatal injury among females, there are 2.5 fatal injuries among males.

Injury (including poisoning) accounts for 7 per cent of all deaths and is the leading cause of death in Australia for males aged under 45 and females under 30. Injuries kill more Australians aged between one and 34 years than all diseases combined and account for more years of life lost to age 65 than cardiovascular disease and cancers combined (Table 3.2).

Table 3.1: Doctor consultations, hospital admissions and deaths resulting from injury by age and sex, 1988

(Per 1,000 population)

	Doctor consultation rate(a)	*Hospital admission rate(b)*	*Death rate*
Age group			
0–4	610	18.7	0.21
5–14	710	18.3	0.11
15–24	890	29.2	0.69
25–44	590	18.3	0.51
45–64	560	15.6	0.48
65 or more	320	30.5	1.09
Males	780	25.5	0.72
Females	470	16.3	0.30
All persons	**620**	**20.9**	**0.51**

(a) Estimated using Medicare claims data for 1988 and data from Australian Bureau of Statistics Australian Health Survey 1983 on reason for most recent doctor visit.

(b) Separation rates for public and private hospitals in New South Wales, Queensland and Western Australia in 1986.

Source: Health Insurance Commission 1989
Australian Bureau of Statistics 3302.0; 4303.3; 4306.1; 4311.0
Health Department of Western Australia 1987
Australian Institute of Health

Table 3.2: Potential years of life lost to age 65, cause of death, 1988

Cause of death	*Years of life lost to age 65*	*Proportion of all causes*
	('000)	*(Per cent)*
Injury and poisoning	211.6	33.1
Cancers	114.2	17.9
Cardiovascular disease	81.8	12.8
Other causes	231.2	36.2
All causes	**638.8**	**100.0**

Source: Australian Institute of Health, based on unpublished data supplied by Australian Bureau of Statistics

In 1986, injuries were the leading cause of hospital admission in Australia, accounting for 10 per cent of all admissions. Accidental falls accounted for close to one in four injury admissions, followed by motor vehicle accidents. Iatrogenic injury (misadventures to patients during surgical and medical care, and adverse or abnormal reactions to medical procedures and medications) accounted for about 13 per cent of all injury-related episodes in acute hospitals (Figure 3.1).

In the 0–4 year age group, accidental drownings are the leading cause of fatal injury, followed by motor vehicle accidents (Figure 3.2). Among older people, accidental falls are the leading cause of fatal injury, followed by motor vehicle accidents and suicides.

Age standardised death rates from injury have decreased consistently for both sexes over recent years. In 1967 the rates were 106 per 100,000 males and 47 per 100,000 females, while in 1988 they were 75 per 100,000 males and 28 per 100,000 females. Death rates declined for all major components except suicides among males, the largest declines being for motor vehicle accidents in males and falls in females.

Australia's fatal injury rate is lower than that of many comparable developed countries, but significantly higher than that of Malta, the Netherlands, the United Kingdom, and Greece (Figure 3.3), mainly due to higher rates of motor vehicle accident fatalities and suicides.

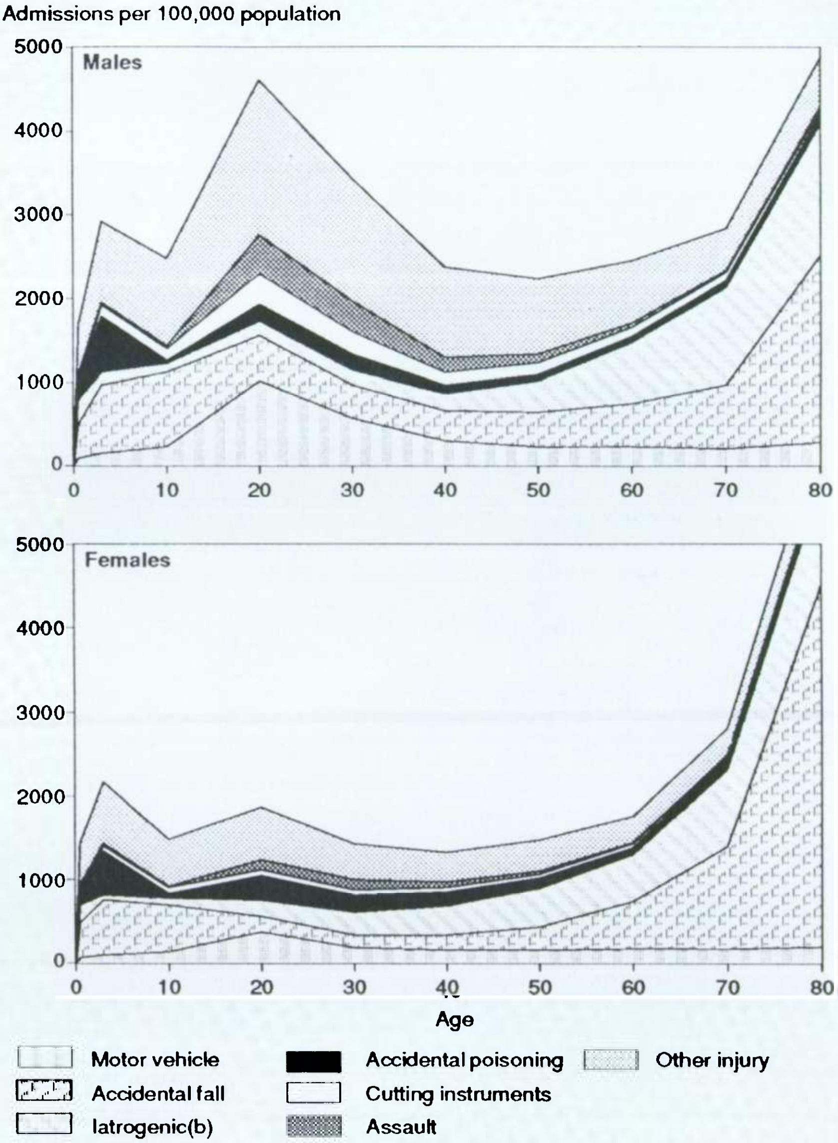
3.1.1 Motor vehicle accidents

Motor vehicle accidents are the greatest cause of fatal injury in Australia. In 1988, they were responsible for 3,078 deaths, one-third of all fatal injuries: the male death rate was 26 per 100,000 and the female rate 11 per 100,000. The rates for both sexes peaked in the age ranges 15–29 and 70 and over. Motor vehicle accidents are the major cause of death in the 15–29 year age group, being responsible for 52 per cent of fatal injuries and nearly 37 per cent of all deaths (Figure 3.2).

Between 1960 and 1988, the road accident fatality rate fell by more than 30 per cent, from 25 to 17 deaths per 100,000 a year. Relative to vehicle kilometres travelled, the decline was 60 per cent, from 44 to 18 deaths per billion kilometres (Federal Office of Road Safety 1989).

Australia's road fatality rate of 18.5 per 100,000 is similar to that of the United States and Canada (19 per 100,000 and 17 per 100,000 respectively in 1987) but much higher than that of the United Kingdom and Sweden (both 9.4 per 100,000) and Japan (9.9 per 100,000).

Figure 3.1: Hospital admission rates for injury by cause, age(a), Queensland, 1988



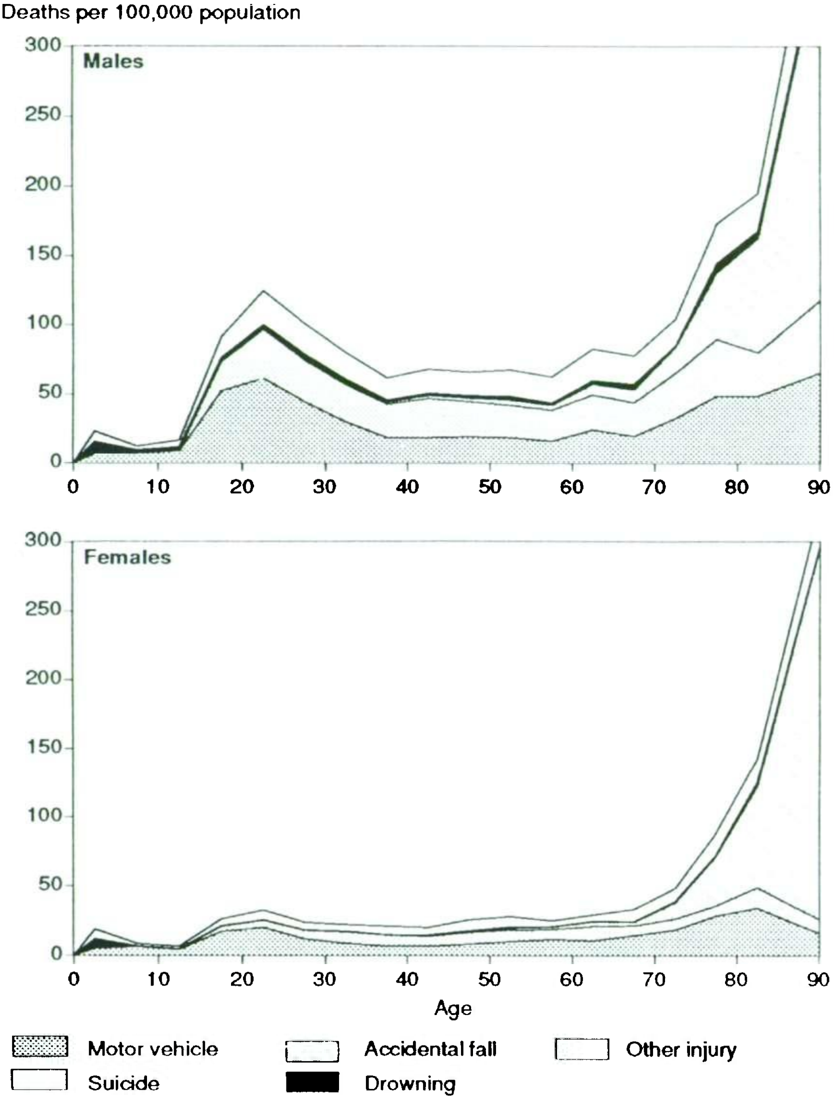
(a) Rates plotted at mid–points of age groups, rates for persons aged 75 years or more plotted at 80 years.

(b) Includes misadventures during medical care, abnormal reactions, late complications and injuries because of therapeutic use of drugs, medicinal and biological substances.

Source: Australian Bureau of Statistics 4303.3

However, in relation to vehicle kilometres travelled the international differences are less pronounced. In 1987, there were 19 deaths per billion kilometres in Australia compared with 15 per billion in Sweden and the United States, 17 per billion in the United

Figure 3.2: Fatal injury rates by cause, age, 1988



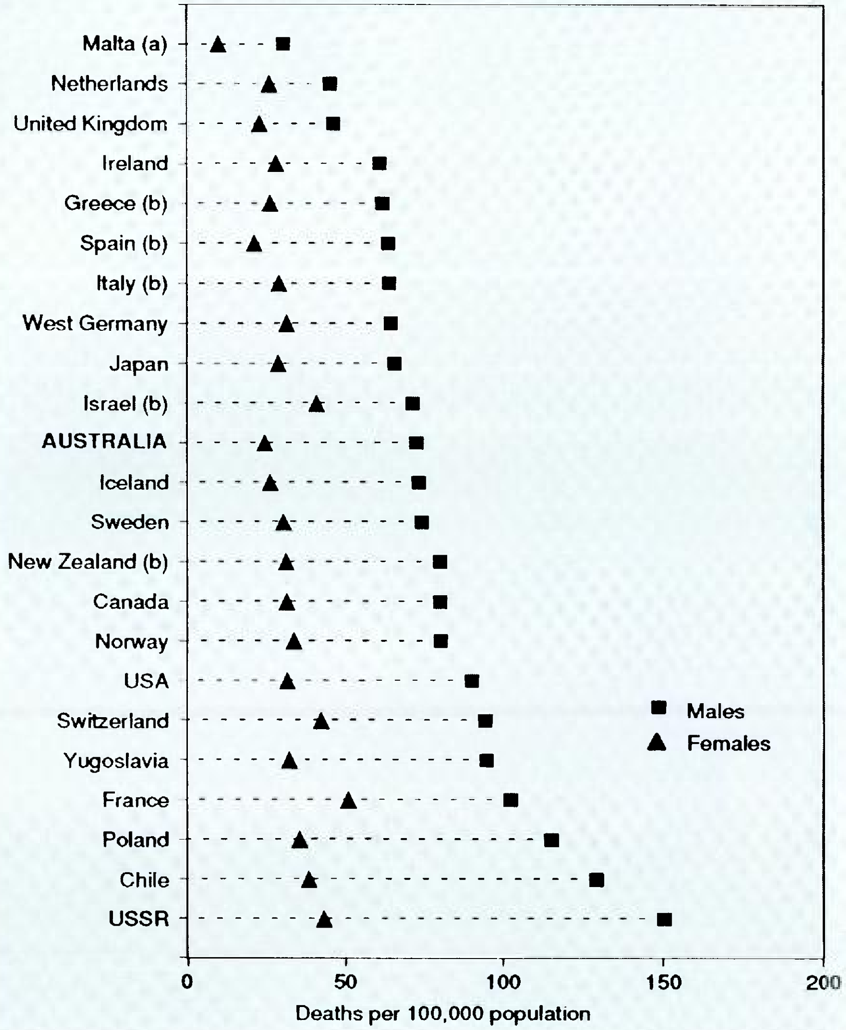
Note: Rates for 5–year age groups plotted at mid–points of age ranges, rates for persons aged 85 years or more plotted at 90 years.

Source: Australian Bureau of Statistics unpublished

Kingdom and 21 per billion kilometres in Japan. The most recent data available for Canada and New Zealand relate to 1985, when the fatality rates per kilometre travelled were 14 per cent and 43 per cent higher respectively than the Australian rate (Federal Office of Road Safety 1989).

In 1988, 37 per cent of car drivers and motor cycle riders who were killed had a blood alcohol level over the legal limit for the State or Territory where the accident occurred.

Figure 3.3: Injury and poisoning deaths, age standardised rates, selected countries, 1987



(a) Malta 1988
(b) Greece, Italy, Israel and New Zealand 1986, Spain 1985

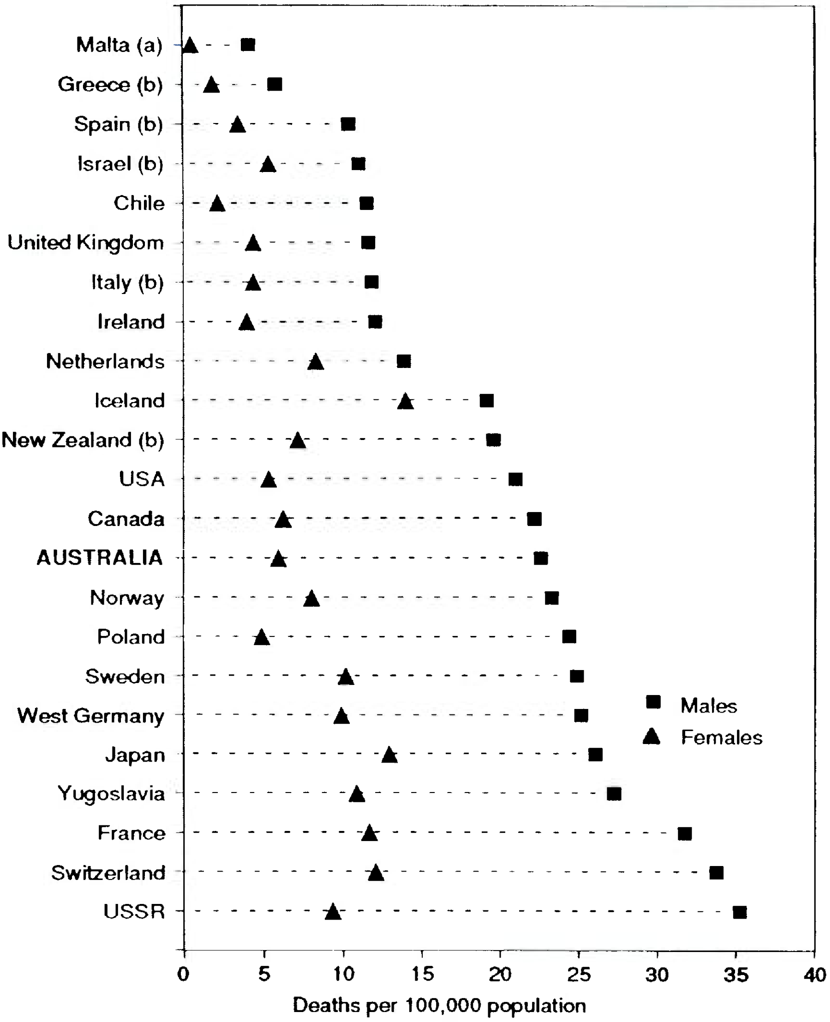
Source: World Health Organization 1988; 1989

3.1.2 Suicide and self-inflicted injury

In 1988, the second largest cause of fatal injury was suicide, accounting for 2,197 deaths. The male suicide rate was 21 per 100,000 and the female rate was 6. Suicides accounted for 2.7 per cent of male deaths and 0.9 per cent of female deaths.

Since the early 1970s, the female suicide rate has declined by about 25 per cent, falling to 6 per 100,000 in 1988. However, the male rate remained steady through the 1970s at about 16 per 100,000 and then increased to 21 per 100,000 in 1988.

Figure 3.4: Suicides, age standardised rates, selected countries, 1987



(a) Malta 1988
(b) Greece, Israel, Italy and New Zealand 1986, Spain 1985

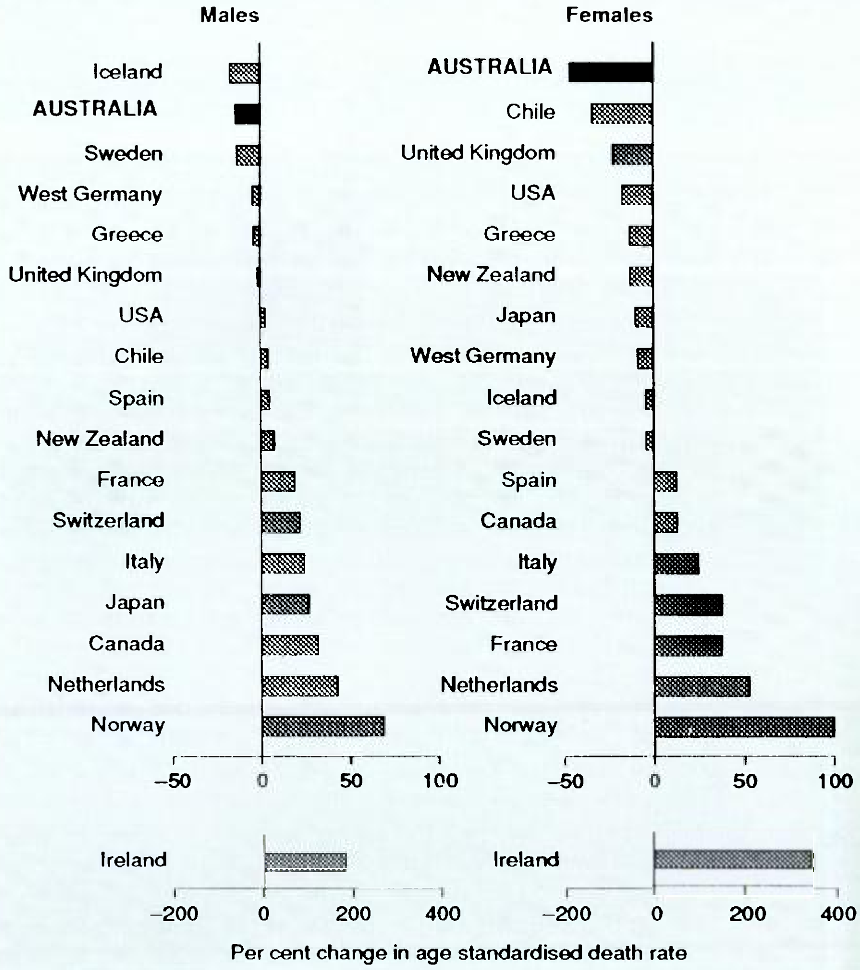
Source: World Health Organization 1988; 1989

Australia's age standardised suicide rates are substantially lower than those in Japan, Switzerland and France but higher than those in the United Kingdom (Figure 3.4).

It is a matter of particular concern that the Australian male suicide rate increased by 30 per cent in the 1980s. In 1983, suicide for the first time overtook deaths from motor vehicle accidents as the leading cause of death among males aged 30–39 years.

This negated the substantial gains made between 1965–1969 and 1980–1984, when Australia had one of the greatest relative declines in suicide death rates among developed countries (Figure 3.5).

Figure 3.5: Suicides, changes in rates, selected countries 1965–1969 to 1980–1984



Source: World Health Organization 1988

Over that period many countries experienced large increases in suicide rates, particularly for males. Australia is now following the overseas trend, although the increase in Australia in the 1980s is too recent to be evident in Figure 3.5. The increasing suicide rate of working–age males in the United Kingdom closely parallels the increase in unemployment (Smith and Jacobson 1989). It is possible that higher unemployment and its impact on the social roles of young males has been a factor also in the increase in Australian male suicide rates.

In 1901 there were 4.5 male suicides for every female suicide. This ratio fell to less than 2 in 1965 but has now increased, to 3.7 in 1988 (ABS 3309.0; 3302.0).

Similar sex differentials in trends in suicide rates have been observed in the United Kingdom and for young adults in the United

States. (National Center for Health Statistics 1988; Smith and Jacobson 1989).

Overseas studies indicate a relationship between the reduction in the female suicide rate over the last 20 years and an increase in the autonomy of women, as reflected in divorce rates and increased female participation in the labour force (Hassan and Tan 1988). Improvements in medical services and technology have also reduced the fatality of non–violent forms of attempted suicide favoured by females (Hassan and Carr 1987).

Overseas studies have found that the majority of people who commit suicide have suffered depressive illness and contacted their general practitioner in the month beforehand (Murphy 1983; Smith and Jacobson 1989). However, since only a small minority of people suffering from depression commit suicide, it is difficult for the primary care provider to identify those people most in need of help, and attempts to develop profiles to predict suicide have not been successful (Goldney and Spence 1987).

Although opinion is divided, there is evidence that elimination of a method of suicide can have a substantial effect on overall suicide rates (Goldney and Burvill 1980). Oliver and Hetzel (1973) have argued that a decline in the suicide rates in Australia in the late 1960s and early 1970s was directly attributable to legislation in 1967 which reduced the quantity of hypnotic/sedative drugs available per prescription. The significant reduction in suicides in the United Kingdom in the 1960s and early 1970s was generally attributed to the elimination of carbon monoxide from domestic gas supplies (Smith and Jacobson 1989).

Drug overdose was the most common form of suicide in the early 1960s: poisoning by solid or liquid substances accounted for 30 per cent of suicides in 1961 compared with 18 per cent in 1988 (Table 3.3). Poisoning by domestic gas accounted for 13 per cent of suicides in 1961, but only 0.5 per cent in 1988, because of the shift to use of carbon monoxide–free natural gas.

Table 3.3: Leading methods of suicide by sex, 1961 and 1988

	(Per cent)	
Method of suicide	*1961*	*1988*
Males		
Firearms and explosives	32	28
Hanging, strangulation and suffocation	16	25
Poisoning by solid or liquid substances	22	12
Poisoning by gases in domestic use	9	1
Poisoning by other gases and vapours	9	21
Females		
Poisoning by solid or liquid substances	50	40
Hanging, strangulation and suffocation	6	20
Firearms and explosives	5	7
Poisoning by gases in domestic use	22	—
Poisoning by other gases and vapours	2	15

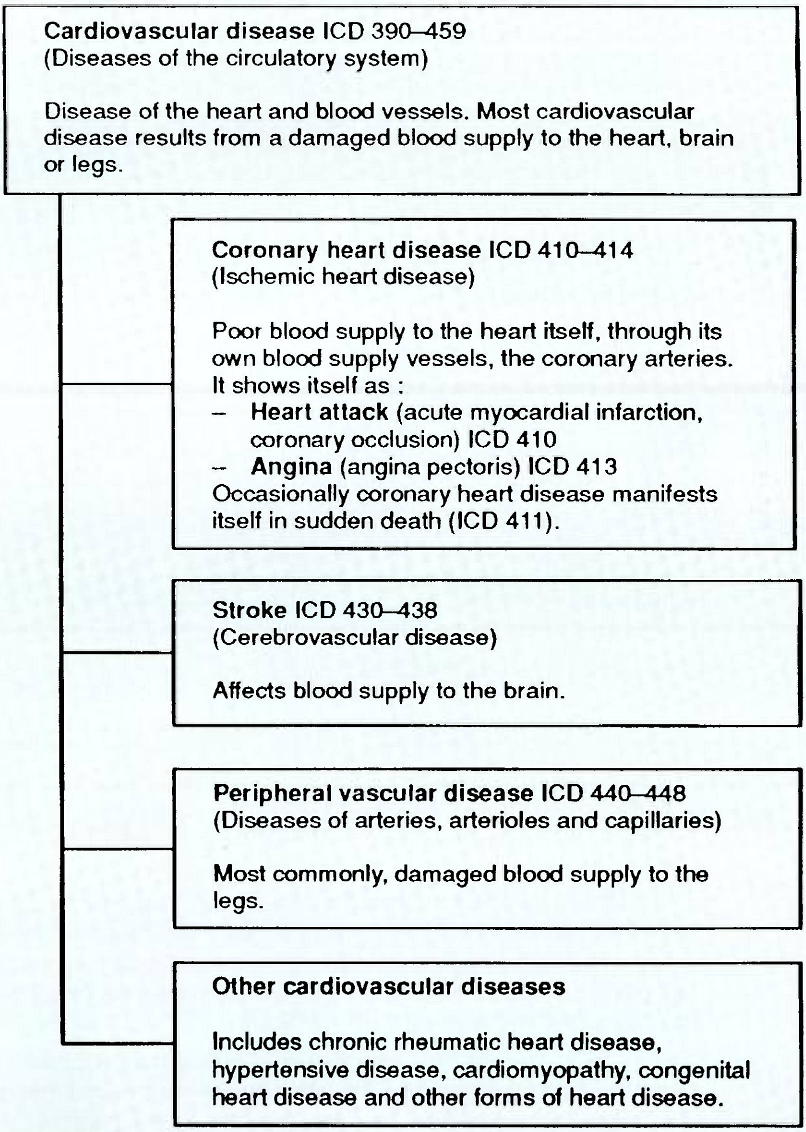
Source: Australian Bureau of Statistics 3302.0; 3309.0

3.2 Today's epidemics: cardiovascular disease

Cardiovascular disease, which includes all diseases of the heart and the circulatory system, is the leading cause of death in Australia, accounting for 46 per cent of all deaths. The classification includes ischemic heart disease and cerebrovascular disease (Figure 3.6).

The epidemic of cardiovascular disease in Australia reached a peak about 1970, and has been in decline since. The male age standardised death rate for cardiovascular disease increased from 372 per 100,000 in 1921 to 804 in 1968 before falling to 411 in 1988. The female rate increased from 330 per 100,000 in 1921 to 519 in 1968 before declining to 261 in 1988.

Figure 3.6: Cardiovascular disease



Cardiovascular disease ICD 390–459
(Diseases of the circulatory system)

Disease of the heart and blood vessels. Most cardiovascular disease results from a damaged blood supply to the heart, brain or legs.

Coronary heart disease ICD 410–414
(Ischemic heart disease)

Poor blood supply to the heart itself, through its own blood supply vessels, the coronary arteries. It shows itself as :

- **Heart attack** (acute myocardial infarction, coronary occlusion) ICD 410
- **Angina** (angina pectoris) ICD 413

Occasionally coronary heart disease manifests itself in sudden death (ICD 411).

Stroke ICD 430–438
(Cerebrovascular disease)

Affects blood supply to the brain.

Peripheral vascular disease ICD 440–448
(Diseases of arteries, arterioles and capillaries)

Most commonly, damaged blood supply to the legs.

Other cardiovascular diseases

Includes chronic rheumatic heart disease, hypertensive disease, cardiomyopathy, congenital heart disease and other forms of heart disease.

Figure 3.7: Cardiovascular deaths, age standardised rates, selected countries, 1987

(a) Greece, Israel, Italy and New Zealand 1986, Spain 1985
(b) Malta interpolated from 1986 and 1988

Source: World Health Organization 1988; 1989

In 1921, deaths from cardiovascular disease accounted for 22 per cent of male and 25 per cent of female deaths. As the death rate rose, so did the proportion, peaking in 1968 at 57 per cent for males and 60 per cent for females before declining to 43 per cent for males and 50 per cent for females in 1988.

In 1988, nearly 57 per cent of deaths from cardiovascular disease were due to ischemic heart disease, which accounted for 26 per cent of all deaths. Cerebrovascular disease accounted for 23 per cent, with the remaining 20 per cent due to other conditions such as hypertensive disease, cardiomyopathy and peripheral vascular disease. Despite substantial falls since 1970, the Australian rate is still high compared with many other countries (Figure 3.7)

3.2.1 Ischemic heart disease

The National Heart Foundation (1990) estimated there were about 26,000 heart attacks among Australians aged 20 to 69 years in 1987 (19,500 in males and 6,500 in females). There were about 20,000 first heart attacks, accounting for 77 per cent of all attacks. About 37 per cent of people suffering a heart attack died within 12 months.

Age standardised death rates for heart disease declined by 43 per cent for females and 46 per cent for males between 1968 and 1988 (Figure 3.8), representing an average 3 per cent annual decline over the 20 years. These declines were the major factor in the increase in life expectancy and the decline in adult death rates between 1963–67 and 1983–87.

Declines occurred at all ages in both males and females (Table 3.4). Percentage declines were fairly uniform across age groups, although because death rates are very much higher in the older age groups, the greatest absolute reductions in numbers occurred in the older age groups.

Table 3.4: Decreases in ischemic heart disease death rates by age group and sex, 1964–1968 to 1984–1988

	(Per cent)	
Age group	*Males*	*Females*
30–34	36	69
35–39	53	71
40–44	55	61
45–49	55	58
50–54	56	56
55–59	52	57
60–64	51	54

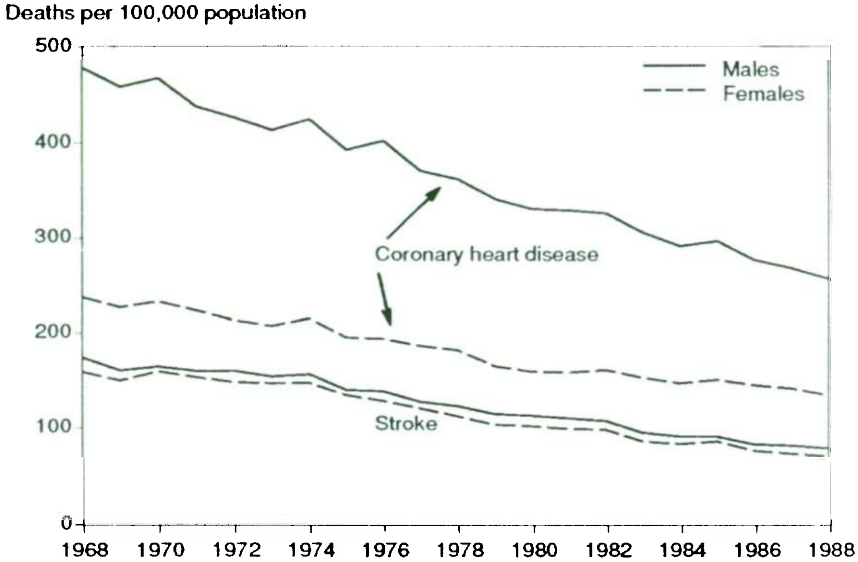
Source: National Heart Foundation 1990

The greatest declines in heart disease death rates during the 1970s were among the professional occupational groups. The least advantaged socioeconomic groups not only had higher mortality rates at the beginning of the period but also experienced smaller declines (Dobson et al 1985).

Despite the declines, Australia's ischemic heart disease mortality rates are high compared with many other countries (Figure 3.9). In 1987, Japan had the lowest death rates from ischemic heart disease: they were close to one–fifth of the Australian rates. The French rates were about one third of those in Australia.

Many other developed countries including the United States, Canada and Japan experienced declines in heart disease death rates in the 1970s and 1980s (Figure 3.10). On the other hand, the declines were much smaller or non–existent in other developed countries such as the United Kingdom, West Germany and France; and in some countries, including Sweden, Spain, Greece and Malta, the death rate for males increased.

Figure 3.8: Coronary heart disease and stroke deaths, age standardised rates, 1968 to 1988



Source: Australian Institute of Health

The declines in deaths from ischemic heart disease have been attributed mainly to decreasing incidence of the disease, in turn due to reductions in the risk factors leading to heart attacks. However, improved treatment of heart attacks has also made a contribution.

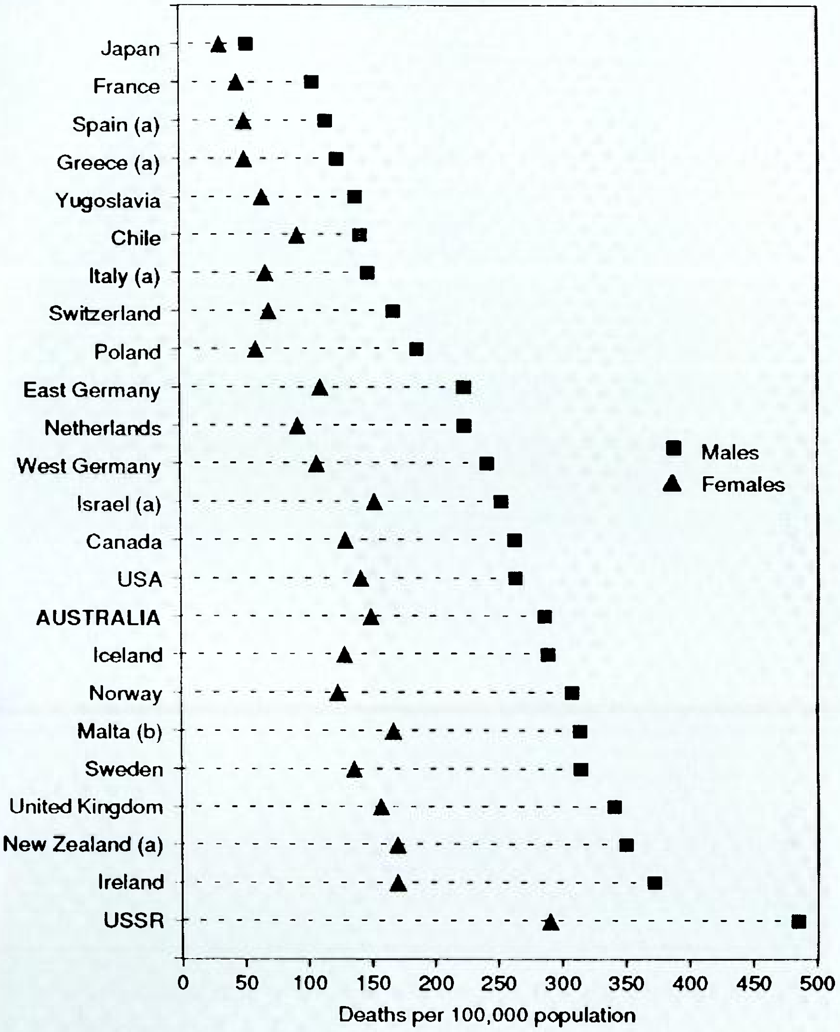
A Western Australian study of heart attacks found that 80 per cent of the decline in mortality from heart attack was in deaths outside hospital (Martin et al 1989), mainly due to a decrease in incidence of heart attacks.

Reductions in levels of three risk factors—cigarette smoking, high blood pressure and high serum cholesterol levels—have been estimated by Dobson (1987) to account for 75 per cent of the decline in Australian heart disease death rates among females in their 50s and for 40 to 50 per cent among males in their 40s.

Similar findings have been made in other countries. New Zealand data suggest that 40 to 50 per cent of the decline in mortality can be attributed to improvements in population risk factor levels (Jackson and Beaglehole 1987).

Goldman and Cook (1984) estimated that more than half the decline in heart disease mortality in the 1970s in the United States was due to changes in lifestyle, particularly to reductions in cholesterol levels and cigarette smoking, while about 40 per cent was attributed to medical interventions, particularly medical treatment of hypertension and diagnosed heart disease. Burke et al (1989) concluded that a substantial proportion of the decline in heart disease observed in the Minnesota Heart Survey between 1980 and 1986 was due to reductions in average community levels of blood cholesterol and of blood pressure, and in smoking rates.

Figure 3.9: Coronary heart disease deaths, age standardised rates, selected countries, 1987

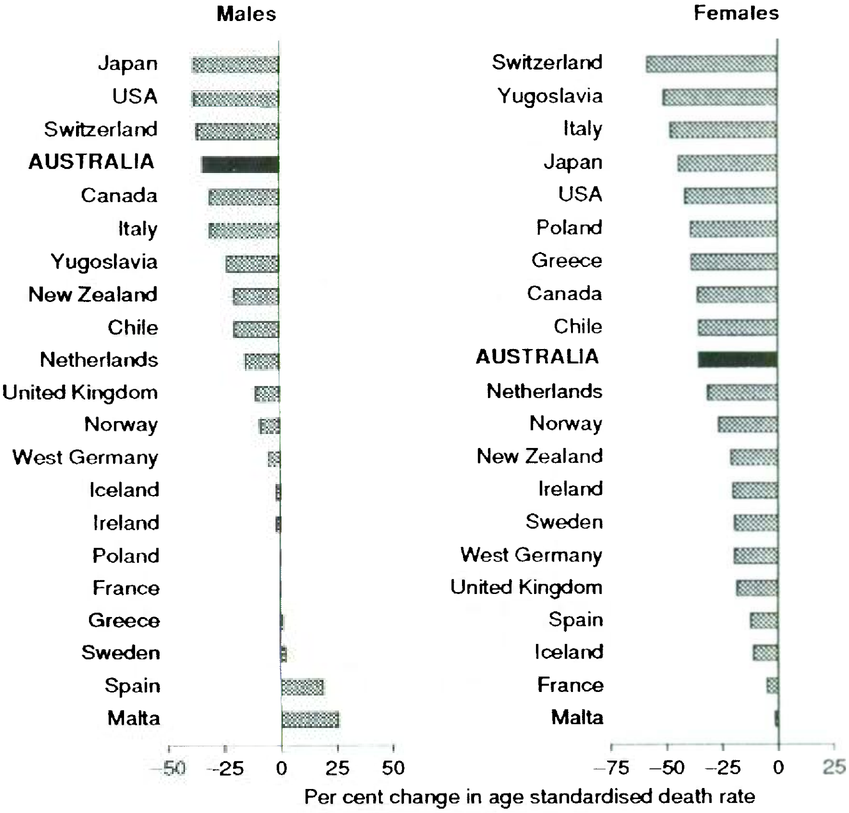


(a) Greece, Italy, Israel and New Zealand 1986, Spain 1985
(b) Malta interpolated from 1986 and 1988

Source: World Health Organization 1988; 1989

The Pooling Project study of 27 countries estimated that most of the decline was due to risk factor changes, with medical care contributing little (Blackburn 1989). The influence of diet on heart disease mortality is supported by correlations between population trends in consumption of animal fats and trends in coronary death rates across 27 countries between 1961 and 1985 (Epstein 1989). In nearly every case where heart disease mortality rose, there was increased consumption of animal fat; where consumption did not change, there was no change in heart disease mortality; and where consumption fell, there was a fall in heart disease mortality (Epstein 1989).

Figure 3.10: Coronary heart disease deaths, changes in rates, selected countries, 1965–69 to 1980–84



Source: World Health Organization 1988

A number of other recent studies have emphasised the importance of dietary and other lifestyle factors in the causation and prevention of cardiovascular disease (Blackburn and Jacobs 1988; Austin 1989; Gordon et al 1989; Paul 1989; Rose 1989; Steinberg 1989), although other authors (Ahrens 1985; Oliver 1986) have questioned the role of dietary and other lifestyle risk factors.

If improvements in lifestyle and related risk factors have been major contributors to the decline in heart disease mortality, greater declines would be expected among the socioeconomically advantaged (who have more scope and resources to alter lifestyle factors) and in the better informed. Such differential improvements in mortality have been observed in the United States (Stamler 1989), the United Kingdom (Marmot 1989) and Australia (Dobson et al 1985).

In spite of the major declines in incidence and mortality in Australia, premature death rates remain high, particularly among disadvantaged groups. Primary prevention needs to be extended and intensified to ensure that all socioeconomic and ethnic groups share in the decline in heart disease mortality.

3.2.2 Stroke

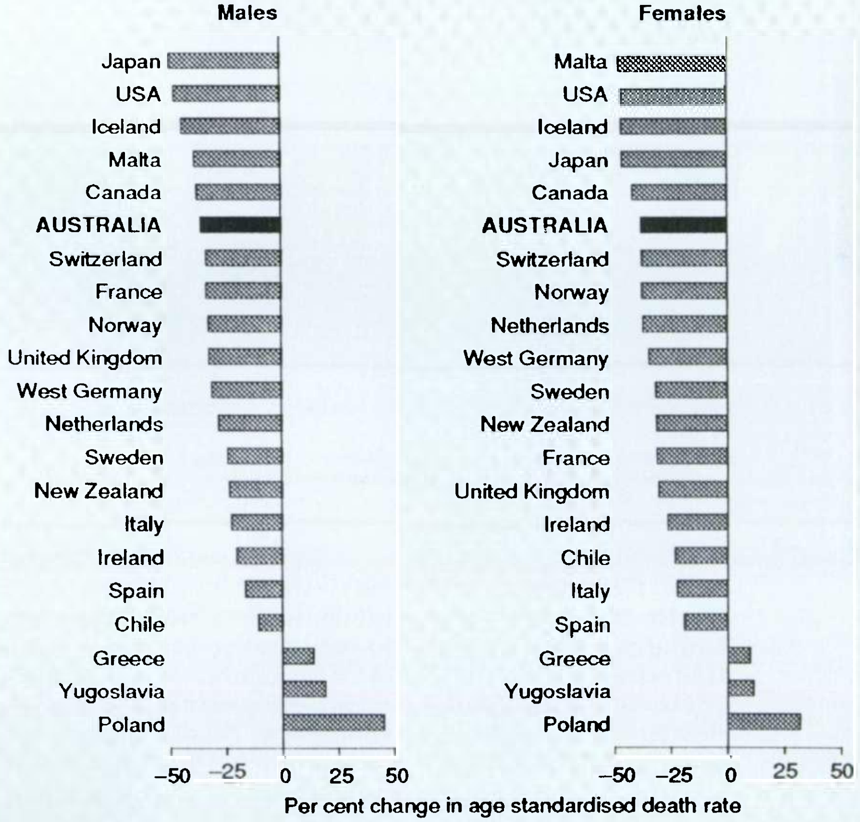
Death rates from stroke rise rapidly with age; from 1.8 per 100,000 a year for those aged under 45 to about 2,777 per 100,000 a year for those aged 85 and over.

In 1968, stroke accounted for 31 per cent of female deaths and 22 per cent of male deaths due to diseases of the circulatory system. Stroke death rates have declined faster than deaths from other circulatory diseases, notably heart disease, so that in 1987 stroke accounted for 27 per cent of the female and 19 per cent of the male deaths due to diseases of the circulatory system.

Stroke death rates began falling in the early 1950s. Between 1968 and 1988, the age standardised stroke death rates declined by 55 per cent for males and 56 per cent for females, corresponding to an average annual decline of 4 per cent compounded over the 20 years.

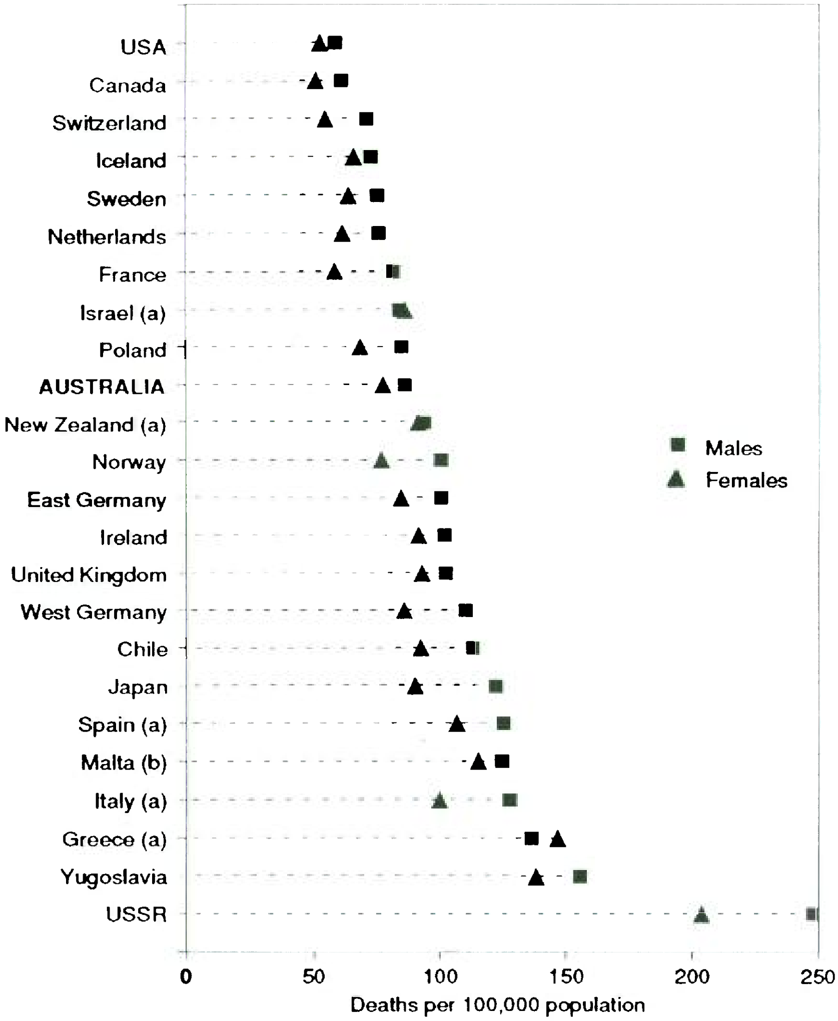
Similar declines occurred in many other developed countries, in contrast to Greece, Yugoslavia and Poland which had significant increases (Figure 3.11).

Figure 3.11: Deaths from stroke, changes in rates, selected countries, 1965–69 to 1980–84



Source: World Health Organization 1988

Figure 3.12: Deaths from stroke, age standardised rates, selected countries, 1987



(a) Israel, New Zealand, Italy and Greece 1986, Spain 1985
(b) Malta interpolated from 1986 and 1988

Source: World Health Organization 1988; 1989

Despite substantial falls in the past few decades, Australia's stroke death rates are substantially higher than those for the US and Canada, which were the lowest among developed countries in 1987 (Figure 3.12).

The dramatic declines in stroke mortality in Australia and other developed countries are thought to be due mainly to decreases in average blood pressure levels (Rose 1989; Blackburn 1989). The relationship between high blood pressure and stroke rates is stronger than for heart disease, and there have been proposals to use stroke mortality in a population as an indicator of mean blood pressure (Ashton 1988; Rose 1989).

3.3 Today's epidemics: cancer

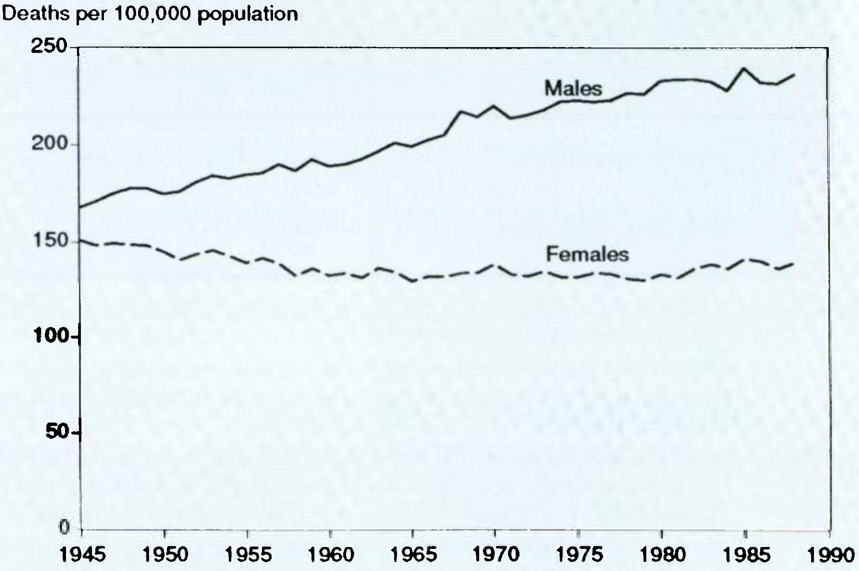
Cancer remains the second most common cause of death in Australia, accounting for 25 per cent of all deaths in 1988. At current rates, about one in three males and one in four females will develop a cancer, excluding non-melanoma skin cancers, by the age of 75 (Giles, Armstrong and Smith 1987).

Cancer is the only major cause of death in Australia which is increasing in both sexes (Figure 3.13). There has been a very large increase in cancer death rates in males since the 1940s, mainly due to smoking related cancers. Female death rates have fallen slightly: the smaller increase in deaths from lung cancer in females has been offset by a reduction in deaths from cancer of the stomach (Figure 3.14).

In 1921, the age adjusted cancer death rate was similar for males and females at 153 deaths per 100,000. Cancer accounted for 11 per cent of male and 9 per cent of female deaths. The male death rate increased significantly from 1921, rising to 236 deaths per 100,000 in 1988. The increase was most marked from the 1940s, especially for males aged 50 years and over. The female death rate has fallen somewhat from its 1921 level to 139 per 100,000 in 1988. Between 1968 and 1988, age adjusted cancer death rates increased by 8 per cent for males and 4 per cent for females, corresponding to average annual increases of 0.4 per cent and 0.2 per cent respectively.

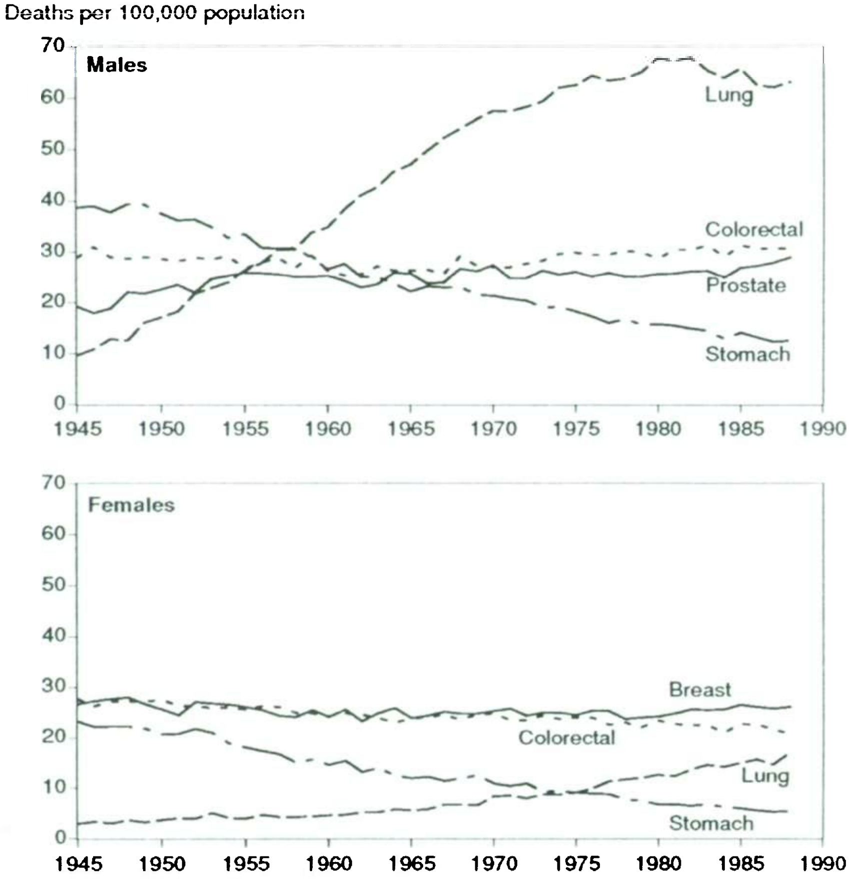
The higher incidence and mortality for males is largely due to their greater use of tobacco. About one-third of cancer deaths can be ascribed to tobacco and another 3 per cent to alcohol. Sexual behaviour and reproductive patterns account for a further 7 per cent

Figure 3.13: Cancer deaths, age standardised rates, 1945 to 1988



Source: Australian Institute of Health

Figure 3.14: Death rates due to major cancers, 1945 to 1988



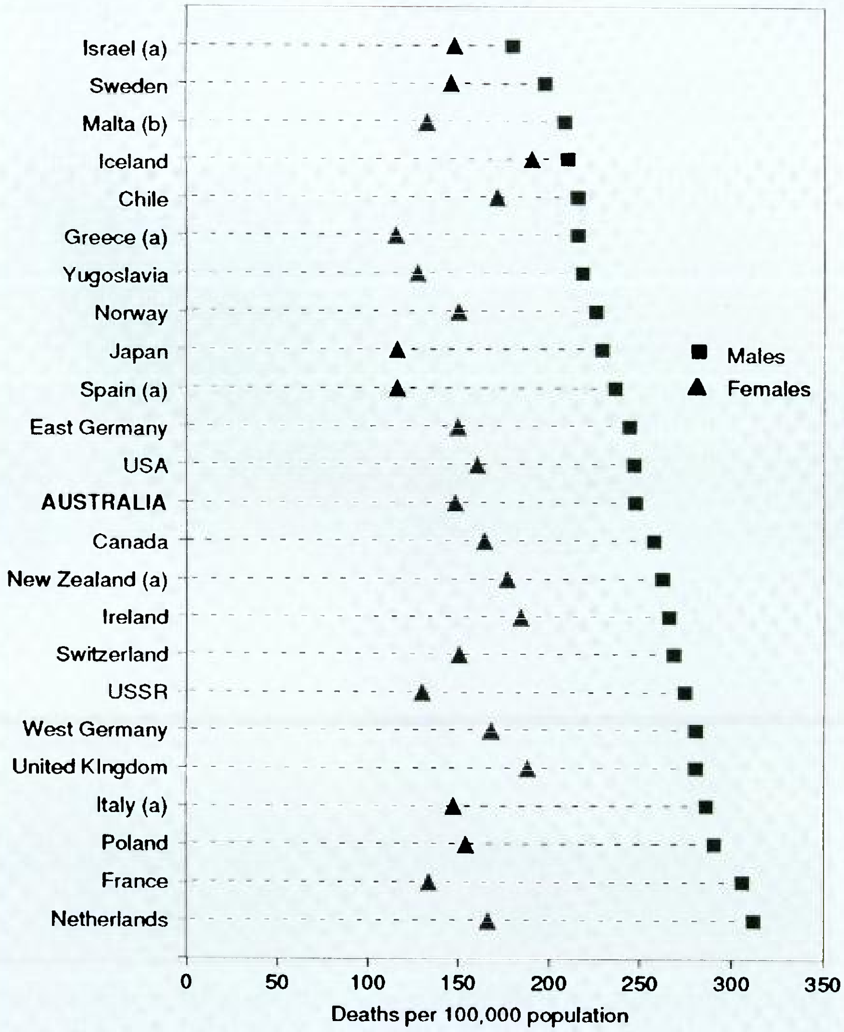
Source: Australian Institute of Health

of deaths, and about 4 per cent of cancer deaths may be due to occupational factors. It has been estimated that between 10 per cent and 70 per cent of cancer could be due to diet but the responsible factors have not been fully established and quantified (Doll and Peto 1981).

On a world-wide basis, cancer death rates are highest in the developed countries. Within selected countries of a similar level of economic development, Australia's rate is similar to that of the United States, higher than those of Japan and Scandinavian countries and lower than those of other Western European countries (Figure 3.15).

Male cancer death rates rose in the 15 years to 1984 in most developed countries, whereas female cancer death rates showed small increases in some countries and small declines in others (Figure 3.16).

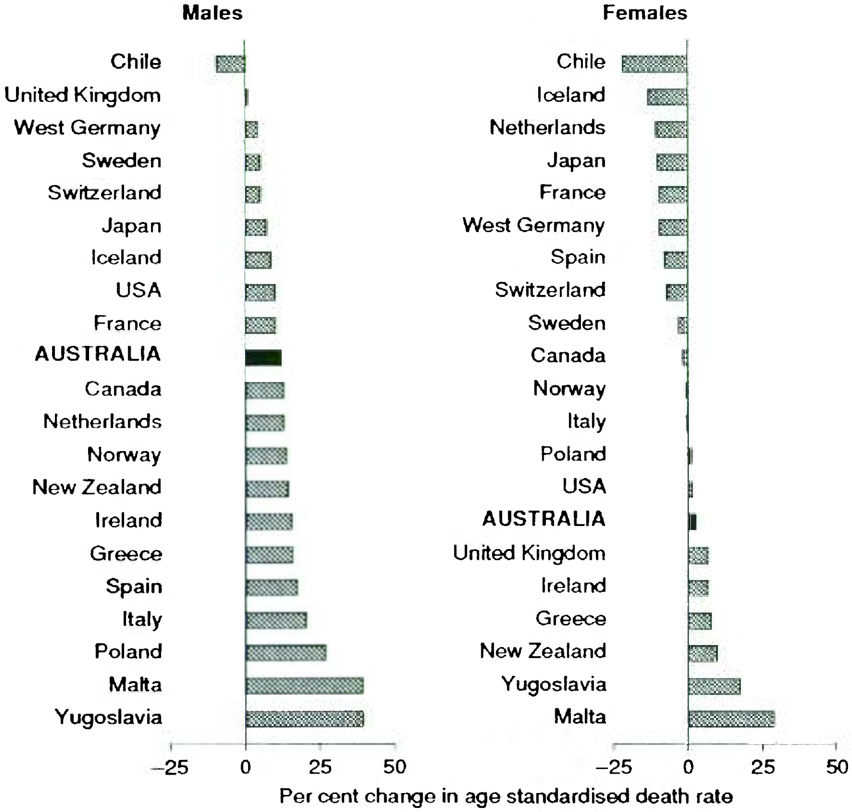
Figure 3.15: Cancer deaths, age standardised rates, selected countries, 1987



(a) Israel, Greece, New Zealand and Italy 1986, Spain 1985
(b) Malta interpolated from 1986 and 1988

Source: World Health Organization 1988; 1989

Figure 3.16: Cancer deaths, changes in rates, selected countries, 1965–1969 to 1980–1984



Source: World Health Organization 1988

3.3.1 Lung cancer

Apart from non–melanoma skin cancer, which is rarely fatal, lung cancer is the most common cancer in Australia both in terms of incidence and deaths (Table 3.5), accounting for one in eight new cancers (Giles, Armstrong and Smith 1987) and one in five cancer deaths. At current rates of incidence, about one in 14 males and one in 61 females will develop lung cancer (Giles, Armstrong and Smith 1987) and almost all of these will die from it. Most lung cancers are due to smoking and could be avoided (See Section 4.4.4).

In 1945, the age adjusted lung cancer death rate was 10 per 100,000 males and 3 per 100,000 females. The male death rate increased seven–fold to a peak of 68 per 100,000 in 1982, and has since declined slowly to 63 per 100,000 in 1988, reflecting the declining prevalence of smoking among males over recent years. The female death rate increased nearly six–fold to 17 deaths per 100,000 in 1988. Female smoking rates, while showing declines, have not been proportionately as great as those for males, and female lung cancer mortality is unlikely to decline significantly in the near future.

Table 3.5: Death, incidence and survival rates by sex, for the 10 leading cancers(a), most recent years

Type of cancer	*Proportion of cancer deaths (1988)*	*Death rate (1988)*	*Incidence rate(b) (1982)*	*Survival rate(c) (1977-1987)*
	(Per cent)	*(Per 100,000 population)*	*(Per 100,000 population)*	*(Per cent)*
Males				
1 Lung	27.3	56.1	61	11
2 Prostate	11.1	22.8	44	62
3 Colon	9.0	18.6	28	48
4 Stomach	5.2	10.6	15	22
5 Pancreas	3.9	8.1	9	4
6 Rectum	3.9	8.0	19	49
7 Non-Hodgkinson's lymphoma	3.6	7.4	11	(d)44–70
8 Bladder	3.0	6.2	21	72
9 Melanoma	2.9	5.9	20	82
10 Brain	2.9	5.9	7	24
Other	27.2	54.2	90	—
All cancers	**100.0**	**203.8**	**325**	**44**
Females				
1 Breast	18.2	28.4	66	74
2 Colon	12.0	18.7	31	51
3 Lung	11.9	18.6	16	12
4 Ovary	4.8	7.5	11	33
5 Pancreas	4.5	7.0	7	3
6 Stomach	4.1	6.3	9	22
7 Non-Hodgkinson's lymphoma	3.7	5.8	9	(d)45–75
8 Rectum	3.2	4.9	14	54
9 Brain	2.8	4.4	5	23
10 Cervix	2.7	4.2	12	69
Other	32.2	48.1	97	—
All cancers	**100.0**	**153.8**	**277**	**56**

(a) All neoplasms (ICD 149–239), ranked according to mortality.

(b) Incidence data relates to all malignant neoplasms (ICD 149–208) excluding non-melanocytic skin cancers (ICD173).

(c) Five–year survival rate in South Australia.

(d) Lower survival rate relates to diffuse non–Hodgkinson's lymphoma, upper survival rate relates to modular lymphoma.

Source: Australian Bureau of Statistics 3201.0, 3302.0
Giles, Armstrong, Smith 1987
Bonett, Roder, Esterman 1989

3.3.2 Mesothelioma

Mesothelioma is a form of cancer of the lung lining predominantly due to occupational exposure to asbestos.

Its incidence in Australia is higher than in any other country for which adequate data are available (Ferguson 1989). The incidence is highest in Western Australia where Australia's largest asbestos mine operated until 1966. Mesothelioma causes more work–related deaths a year in Australia than any other single disorder or injury.

The incidence of mesothelioma rose from very low levels in the 1950s to 4 cases per 100,000 a year for males and 0.5 for females in 1982–1985. Between 1970 and 1980 a five-fold rise in the age standardised mortality rate was observed (Musk et al 1989).

The rise in mortality rates followed an increase in the production and use of asbestos during and after World War II. Although asbestos production and use peaked in 1958 and has now almost ceased, the incidence and mortality are not expected to peak before the year 2000.

3.3.3 Breast cancer

Excluding non–melanoma skin cancers, breast cancer is the third most common cancer in Australia, with more than 99 per cent of cases occurring in females. Females have a one in 16 chance of developing breast cancer and a one in 45 chance of dying from it before age 75 (Giles, Armstrong and Smith 1987).

The age standardised breast cancer mortality has risen from 21 per 100,000 females in 1921 to 26 per 100,000 in 1988. It has been relatively stable since the 1950s. Despite advances in screening and treatment technologies little impact has been made on breast cancer mortality.

3.3.4 Colorectal cancer

Colorectal cancer (cancer of the colon or the rectum) is the most common cancer in Australia in terms of incidence (again excluding non–melanoma skin cancer) and the second most common, after lung cancer, in terms of mortality. The risk of developing colorectal cancer is one in 20 for males and one in 27 for females. The risk of dying from colorectal cancer before age 75 is about one in 45 for males and one in 57 for females (Giles, Armstrong and Smith 1987).

In 1945, the age adjusted colorectal cancer death rate was 29 per 100,000 males and 28 per 100,000 females. Since then,the male age adjusted rate has increased to 31 per 100,000 in 1988, whereas the female rate has declined to 21 per 100,000 (Figure 3.14).

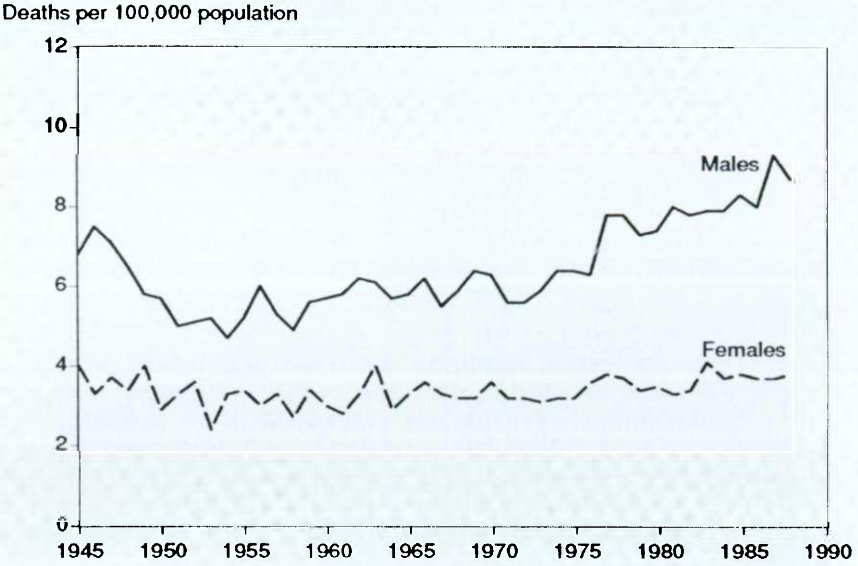
Colorectal cancer appears to be associated with the modern Western diet which is high in fat and protein and low in vegetables, fruit and fibre. Australia has a relatively high incidence compared with the majority of countries, but intermediate rates compared with countries of similar economic development (Giles, Armstrong and Smith 1987).

3.3.5 Skin cancer

Australian skin cancer rates are the highest in the world (Marks 1989). There are three major types of skin cancer: melanomas, basal cell carcinomas (BCC) and squamous cell carcinomas (SCC). BCC and SCC are classed as non–melanocytic or non melanoma skin cancer (NMSC) and usually are not fatal, although they can be disfiguring if not treated early.

For females, the age standardised death rate for skin cancer fluctuated around 4 per 100,000 between 1945 and 1988 (Figure 3.17). The male rate increased slowly from 1950 until the mid–1970s when it began to increase more rapidly to 9 per 100,000 today.

Figure 3.17: Skin cancer deaths, age standardised rates, 1945 to 1988



Note: Includes melanoma and non-melanocytic skin cancers

Source: Australian Institute of Health

Data on the incidence of NMSC are not routinely collected, but a 1985 national survey estimated approximately 800 new cases per 100,000 population a year (Giles et al 1988), making it the most common cancer in Australia in terms of incidence.

Melanomas are the fifth most common cancer (after lung, colorectal, breast and prostate). Melanomas are responsible for 3 per cent of cancer deaths and 0.7 per cent of all deaths. Early detection and treatment can prevent many of these deaths. In 1988, there were 784 melanoma related deaths compared with 219 NMSC deaths. 14 per cent of melanoma deaths were among people under 40 compared with only 4 per cent of NMSC deaths (ABS unpublished data).

Australians have slightly less than a one in 50 risk of developing malignant melanoma before age 75. The incidence of malignant melanoma is 10 times higher than in the United Kingdom, where the majority of Australians' forebears originated, suggesting that about 90 per cent of melanomas in Australia are related to the environment and behaviour.

The ultraviolet component of sunlight is the major risk factor for skin cancer. Australian-born people are more than twice as likely to develop skin cancer than people who emigrated from the United Kingdom as adults, suggesting that reducing childhood exposure to sunlight is important in the prevention of skin cancer (Holman et al 1986; Marks et al 1990).

Queensland has the highest reported incidence rate for melanoma in Australia (and the world) and Tasmania usually has the lowest incidence in Australia, reflecting differences in exposure to sunlight with latitude (Giles, Armstrong and Smith 1987). Between 1978 and 1988 there was an 88 per cent increase in melanoma incidence and an almost doubling of melanoma mortality in Tasmania (Dwyer et al 1989). Given the long lag between sunlight exposure and development of skin cancers, the most likely explanation is increased exposure to sunlight associated with lifestyle changes.

There are fears that depletion of stratospheric ozone may lead to increased skin cancer incidence and mortality. The National Health and Medical Research Council (1989) has estimated that for every 1 per cent increase in biologically active ultraviolet radiation, there will be an increase of about 2,500 new cases of NMSC and 50 new cases of melanoma a year. Associated with this will be an extra 4 to 6 deaths due to NMSC and an extra 10 to 15 deaths a year due to melanoma.

The likely effects of ozone depletion on skin cancer rates will also depend on whether people change their behaviour to avoid exposing themselves to sunlight. Australians can take action to reduce both skin cancer rates and the possible effects of ozone depletion by changing their attitudes and exposure to sunlight.

3.4 Today's epidemics: AIDS

AIDS continues to be a major concern in Australia. Although AIDS deaths still represent a very small proportion of total mortality, AIDS mortality has been increasing much faster than for any other single cause of death, leading to concern about a widespread epidemic. No vaccine or cure is yet available.

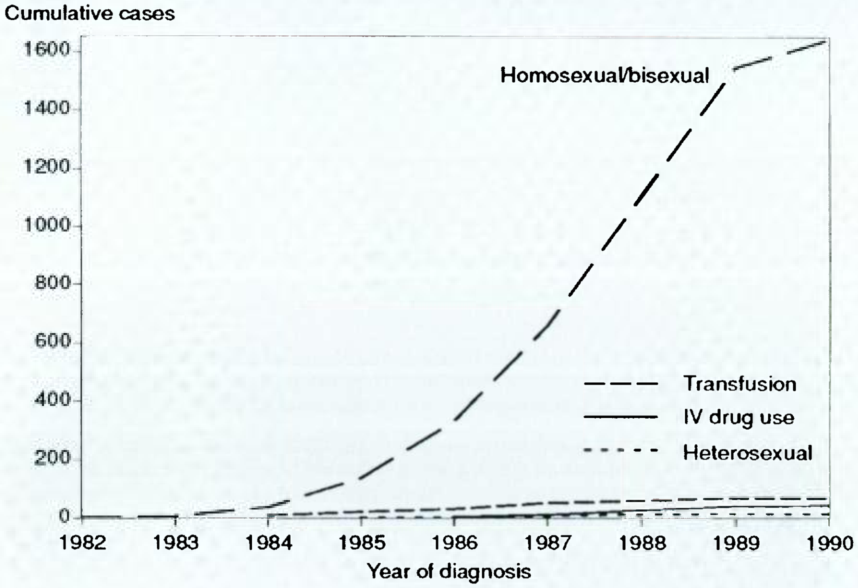
To 1988, the Australian Bureau of Statistics had recorded 396 AIDS deaths as such, although many other AIDS deaths appear to have been classified as other causes. Because of the long incubation, the number of diagnoses in the next few years is already largely determined by the numbers of people currently infected with Human Immunodeficiency Virus (HIV), the virus that causes AIDS. New AIDS cases will continue to develop for several years, even if no new transmission occurs.

There is evidence that the epidemic is unlikely to affect as many people as previously feared. Early estimates of the numbers already infected with HIV, and of the likely increase in cases, appear to have been too high. Previously, the estimates of the number of people infected varied greatly but ranged up to 100,000. The National HIV/AIDS strategy is based on an estimate that about 15,000 Australians are infected (Commonwealth Department of Community Services and Health 1989). The most recent estimate of 12,500 to 17,000 infected is of the same magnitude (Solomon and Wilson 1990).

The AIDS epidemic is made up of sub–epidemics in largely separate risk groups. It began in homosexual and bisexual men, then affected blood transfusion and blood product recipients, and only later involved intravenous drug users and heterosexuals (Figure 3.18).

The epidemic has had different characteristics in these different subgroups: for example transmission of HIV through blood transfusion and blood products ceased once treatment of blood factors and testing of blood donations was introduced in 1985, whereas infection via intravenous drug use is continuing.

Figure 3.18: Cumulative AIDS cases by year of diagnosis and transmission group, 1982 to 1990(a)



(a) Data to 23 April 1990

Source: National Centre in HIV Epidemiology and Clinical Research unpublished

The time between successive doublings of the number of AIDS cases in homosexual and bisexual men has lengthened considerably (Table 3.6), indicating that in those risk groups at least the epidemic is slowing.

Despite the seriousness of the infection, it is clear that not all AIDS cases are routinely notified. For example, 90 cases which had not previously been included in the national statistics were recently identified in New South Wales. (National Centre in HIV Epidemiology and Clinical Research 1990).

There are also problems with the data on deaths from AIDS. The National Centre in HIV Epidemiology and Clinical Research identified 199 deaths of AIDS patients in 1988, while according to the Australian Bureau of Statistics figures, there were 136. There were a further 95 deaths with AIDS mentioned on the death certificate, and 8 deaths from opportunistic infections almost certainly due to AIDS even though the death certificates did not mention it, giving a total of 239. This is substantially higher than the National Centre's figure, and itself may be an underestimate.

In June 1987 the anti-viral agent azidothymidine, generally known as AZT, became widely available for the treatment of AIDS. Until then, the only treatment available was for the complicating illnesses such as infections and cancers. Use of AZT has substantially extended the survival of AIDS patients (Figure 3.19).

Table 3.6: Intervals between successive doubling of the number of cases of clinical AIDS in homosexual and bisexual men

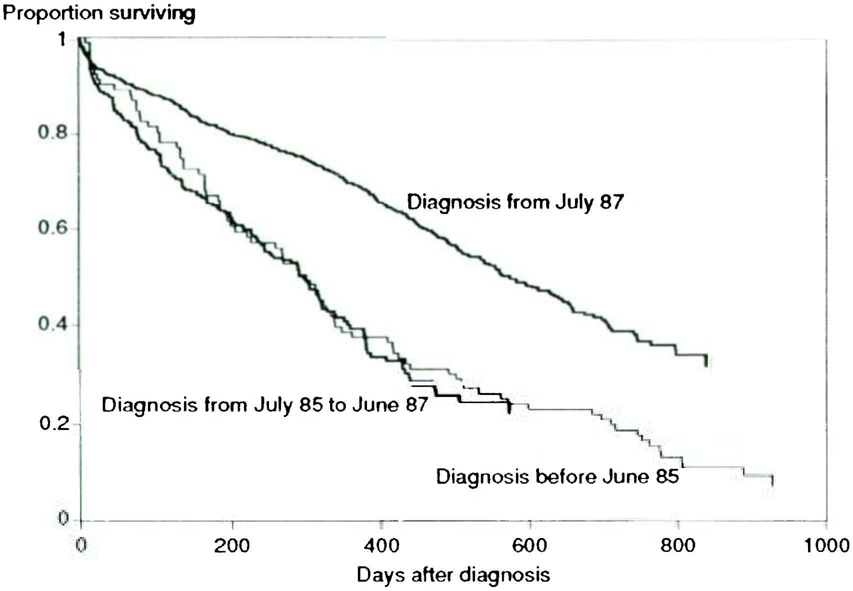
Case	*Month and year diagnosed*	*Interval*
50th	February 1985	
		5 months
100th	July 1985	
		10 months
200th	May 1986	
		10 months
400th	March 1987	
		14 months
800th	May 1988	
		19 months
1,600th(a)	December 1989	

(a) There were 1,549 notified AIDS cases in homosexual and bisexual men at 31 December 1989. Late registrations mean that the 1600th registration will have occurred in December 1989 or January 1990.

Note: The definition of AIDS was broadened in January 1988. Use of AZT prior to development of AIDS will also have affected intervals from about this time. The net effect of these two opposing influences on growth of the epidemic is not known.

Source: National Centre in HIV Epidemiology and Clinical Research 1990

Figure 3.19: Homosexual/bisexual men with AIDS in Australia: survival since diagnosis by time of diagnosis



Source: National Centre in HIV Epidemiology and Clinical Research unpublished

3.5 Asthma: a new epidemic?

Asthma deaths in Australia increased in the 1980s, from 543 in 1980 to 826 in 1988. Although standardised death rates fluctuate from year to year, Figure 3.20 indicates a general increase over the period.

For all ages, combined 1988 mortality was about 5 per 100,000 in both sexes. Among those aged 20 to 34 years and 60 and over, age specific rates for males were slightly higher than those for females.

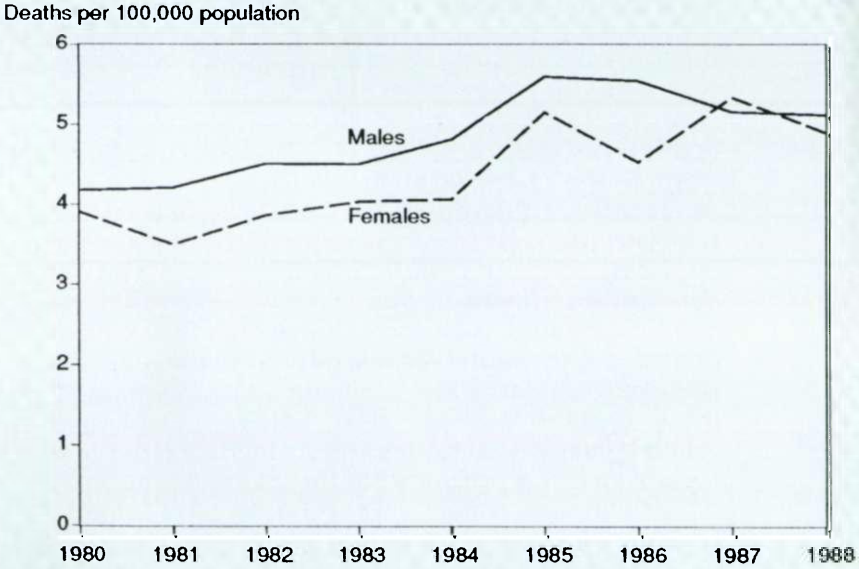
The highest rates of asthma mortality occur at older ages. Although there are problems in establishing asthma as a cause of death at older ages, the data indicate that, throughout the 1980s, about 70 per cent of asthma deaths occurred in people aged 55 or over.

The data do not indicate any increases in asthma mortality in people under age 20, but it is difficult to draw firm conclusions about trends in asthma mortality at these ages because the numbers of deaths are very low. Above age 20, asthma mortality has increased in almost every age/sex group (Australian Institute of Health, unpublished data).

Australian asthma mortality rates are higher than those of England and Wales, Canada and the United States, but lower than those in New Zealand (Figure 3.21). Further, the Australian rate has risen at a greater rate than in Canada and the United States.

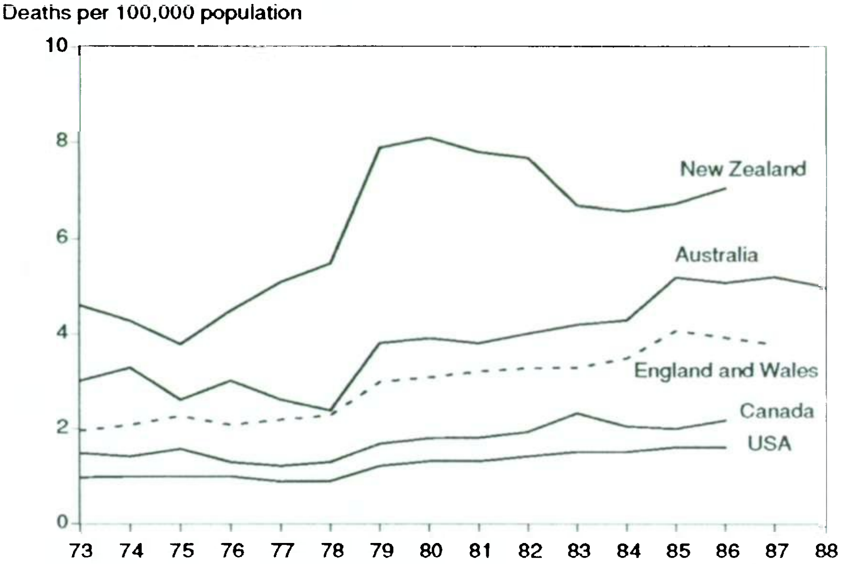
Much less is known about the differences in prevalence and severity of the disease between countries. Prevalence in Australia has been estimated variously from 7 per cent to 15 per cent of the population. Available data on asthma prevalence are incomplete, longitudinal studies are rare and comparisons are made difficult by the problem of defining the disease accurately.

Figure 3.20: Asthma deaths, age standardised rates, 1980 to 1988



Source: NHMRC Working Party on Asthma Associated Deaths 1988

Figure 3.21: Asthma deaths, international trends, 1973 to 1988



Source: NHMRC Working Party on Asthma Associated Deaths 1988
Australian Institute of Health

Most available population prevalence data relate to children (Table 3.7). Reported prevalence ranges from negligible in some developing countries to about 13 per cent in 8 to 10 year olds in Sydney. New Zealand, which has the highest reported death rates, also has the highest current prevalence rates, except for a few island populations, such as the Maldives.

Increased hospital admission rates for asthma have been documented in recent years in Australia, New Zealand and England (van Asperen 1987). Such data may reflect increases in prevalence or severity, but may also reflect changes in treatment practices or community attitudes.

Apparent changes in incidence and prevalence over time, and international differences, may relate to a variety of factors apart from true variations in the occurrence of the disease including variations in oding of deaths, variations in severity, and variations in health care and treatment.

Research has suggested that a significant proportion of asthma deaths are preventable. Key patient management factors present in preventable deaths include inadequate assessment of prior asthma, inappropriate therapy, poor patient compliance, and delays in seeking medical care. Risk factors include chronic severe asthma, the occurrence of a previous life threatening attack, a previous hospital admission for asthma, and psycho–social problems. Further research is required, particularly in the development of an index of risk of death from asthma. More data are also required relating various sociodemographic characteristics and the treatment and management of asthma to asthma mortality.

Table 3.7: International comparison of reported prevalence of current asthma in children

	Prevalence (Per cent)	*Age group (Years)*
Gambia	0	(a)
Papua New Guinea	0	(a)
India (rural)	0	0—9
India (city)	0.2—0.4	0—9
England	2	11
Tuscon, United States	8.4	5—14
Busselton, Western Australia	6	6—12
Sydney, New South Wales	12.7	8—10
New Zealand	17.2	7
Maldives	20.2	(a)

(a) Age not specified.

Source: Woolcock 1986

3.6 Drug abuse: another epidemic?

Although drug abuse is not a specific disease, it is a factor in many of the epidemics already reviewed. It also contributes to morbidity and mortality in numerous other ways.

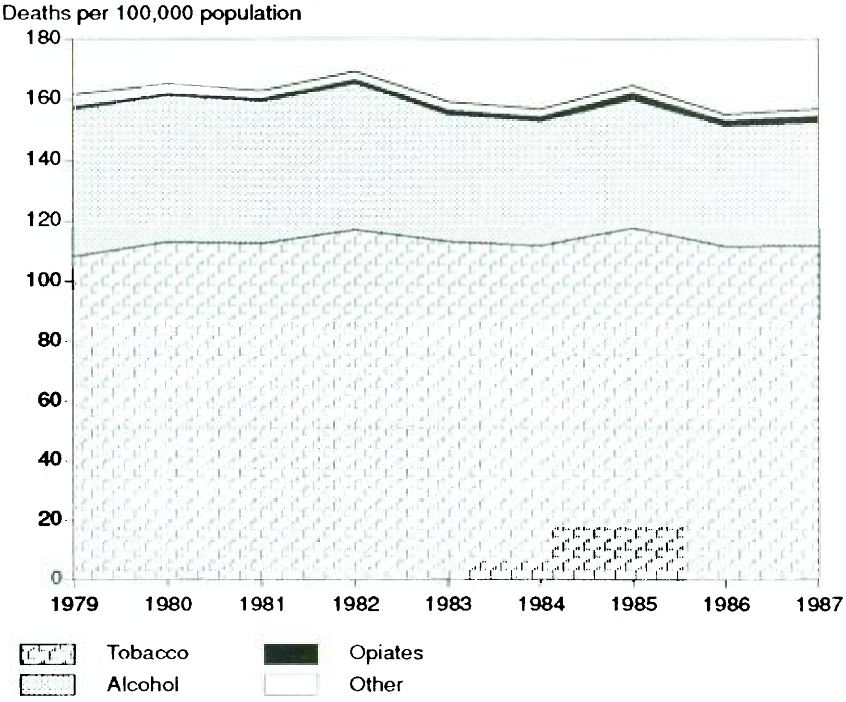
In Australia, about one in five deaths and one in eight hospital bed–days are estimated to be caused by drugs. In the 15–34 year age group, about one in three deaths is estimated to be caused by drugs (Holman et al 1988).

Tobacco was estimated to be responsible for 15 per cent of all deaths in 1987, accounting for about 71 per cent of all drug–caused deaths (Figure 3.22). Tobacco smoking remains Australia's largest preventable cause of death and disease. By the end of the century, a further 500,000 Australians will have died because they smoked (Daube 1987). For every death due to heroin and other opiates, there are 56 deaths due to tobacco–caused illness (Table 3.8).

Among young people, the majority of drug–caused deaths are due to alcohol. In 1987, an estimated 65 per cent of all drug–caused deaths in the 15–34 year age group were due to alcohol, and 17 per cent were due to opiates (Figure 3.23).

The overall rate of drug–caused deaths in Australia decreased slightly between 1979 and 1987 (Figure 3.22), mainly because of an estimated decrease of 15 per cent in alcohol–caused deaths. This was due mainly to a decrease in the overall level of road accident fatalities combined with a decrease in the proportion of road fatalities caused by alcohol. The estimated rate of drug–caused deaths in the 15–34 year age group decreased by 30 per cent, again mainly due to the substantial fall in alcohol–caused deaths (Figure 3.23). However, the rate of opiate–caused deaths in 15–34 year olds more than doubled.

Figure 3.22: Estimated drug–caused death rates, 1979 to 1987



Source: Commonwealth Department of Community Services and Health 1990

3.6.1 Tobacco

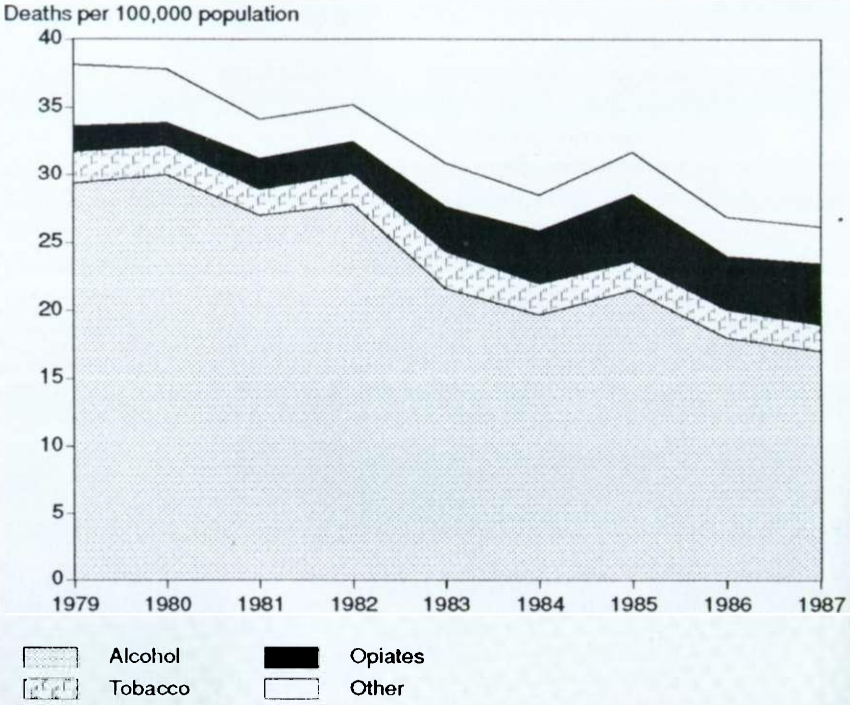
Tobacco–caused disease is generally considered to be the leading preventable cause of mortality and morbidity in Australia.

The major conditions contributing to tobacco–caused mortality are ischemic heart disease (29 per cent), lung cancer (25 per cent), chronic bronchitis (18 per cent), peripheral vascular disease (6 per cent), stroke (5 per cent) and upper alimentary tract and laryngeal cancers (5 per cent)(Holman et al 1988).

Tobacco is the leading addictive substance causing death and premature mortality in Australia and is likely to remain so for the rest of the century. Tobacco smoking was responsible for an estimated 18,165 deaths in 1987, representing more than 15 per cent of all deaths (Table 3.8). It is estimated to be the cause also of 11 per cent of potential years of life lost before age 70, 3 per cent of hospital episodes, 4 per cent of hospital bed–days, and 16 per cent of all new cancers (Table 3.9).

The prevalence of tobacco smoking is declining in Australia for both males and females, although the female rate is declining much more slowly than the male (Section 4.4.4). Despite these trends, Australia still has one of the highest levels of tobacco smoking in the world (Commonwealth Department of Community Services and Health 1990).

Figure 3.23: Estimated drug–caused death rates among persons aged 15–34 years, 1979 to 1987



Source: Commonwealth Department of Community Services and Health 1990

3.6.2 Alcohol

Alcohol is estimated to be responsible for about 5.5 per cent of all deaths, 8 per cent of potential years of life lost before age 70, 2 per cent of hospital episodes, 4 per cent of hospital bed–days, and 5 to 6 per cent of all newly diagnosed cancers (Tables 3.8 and 3.9).

The major conditions contributing to alcohol–related mortality are cancers of the upper alimentary tract and larynx (25 per cent of all alcohol–related mortality), stroke (17 per cent), road injuries (16 per cent), alcoholic liver cirrhosis (13 per cent), suicide (8 per cent), colorectal cancer (8 per cent) and breast cancer (7 per cent).

Major conditions contributing to alcohol–related hospital morbidity are alcoholic psychosis and dependence (42 per cent of all alcohol–related bed–days), fall injuries (20 per cent), stroke (15 per cent) and road injuries (13 per cent).

There has been a 10 per cent decline in the per capita consumption of alcohol in Australia in the last decade. A draft National Health Policy on Alcohol is being developed.

Table 3.8: Estimated drug–caused deaths(a) by drug involved, Australia, 1987

Drug/cause of death	*Deaths (Number)*	*Deaths per 100,000 population*	*Per cent of drug deaths*	*Per cent of all deaths*
Tobacco				
Cancers	6,222	**38.3**	24.4	**5.2**
Ischemic heart disease	5,134	**31.6**	**20.1**	**4.3**
Chronic bronchitis	3,510	21.6	13.8	**2.9**
Other	3,299	20.3	12.9	**2.8**
Total tobacco	**18,165**	**111.7**	**71.2**	**15.2**
Alcohol				
Cancers	1,898	**11.7**	**7.4**	**1.6**
Alcoholism & alcoholic liver cirrhosis	1,038	**6.4**	**4.1**	**0.9**
Road injuries	805	**4.9**	**3.2**	**0.7**
Other	2,880	**17.7**	**11.3**	**2.4**
Total alcohol	**6,621**	**40.7**	**26.0**	**5.5**
Other drugs (b)				
Total opiates	323	**2.0**	**1.3**	**0.3**
Total barbiturates	85	**0.5**	**0.3**	**0.1**
Total other	301	1.9	1.2	**0.3**
Total other drugs	**709**	**4.4**	**2.8**	**0.6**
Total all drugs	**25,495**	**156.7**	**100.0**	**21.3**

(a) Total drug–caused deaths. These figures do not take account of deaths prevented by drug use (see Footnotes to Table 3.9).

(b) Includes illicit drug use and licit drug use (prescribed and over–the–counter pharmaceuticals) but excludes deaths due to adverse reactions to therapeutic use of drugs.

Source: Commonwealth Department of Community Services and Health 1990

3.6.3 Illicit drugs

The major conditions contributing to mortality related to the illicit drugs are narcotic dependence and drug suicide.

The study by Holman et al (1988) defined illicit drugs as narcotics, cannabis, hallucinogens, stimulants and sedatives. Some of these drugs are available legally only on medical prescription, whereas others are not available legally for any purpose.

Because morbidity and mortality statistics do not distinguish between licit and illicit use of such drugs, it is difficult to estimate the number of deaths they cause.

Holman et al (1988) looked at the total health impact of these drugs, irrespective of whether use was licit or illicit. They estimated that in 1986, illicit drugs caused 479 deaths, representing 0.4 per cent of all deaths. They also accounted for about 2 per cent of potential years of life lost before age 70 and probably less than 0.5 per cent of hospital episodes and bed–days (Tables 3.8 and 3.9).

In the same study, an alternative method of estimating deaths based on mortality rates in addict populations indicated that mortality due to illicit drugs could be underestimated by at least 30 per cent.

Table 3.9 Estimated net health impact of alcohol, tobacco and illicit drugs by sex, 1986

Health impact	*Tobacco(a)*	*Alcohol(b)*	*Other(c)*	*Total*
		(Number)		
Males				
Deaths	13,330	3,129	309	16,768
PYLL before age 70(d)	69,129	45,515	11,218	—
Hospital episodes(e)	73,963	55,727	4,579	134,269
Hospital bed-days(e)	717,283	727,513	30,544	147,340
Newly diagnosed cancers	6,947	1,655	—	8,602
Females				
Deaths	4,470	2,231	170	6,871
PYLL before age 70(d)	22,894	20,519	5,220	—
Hospital episodes(e)	29,369	20,740	4,720	54,829
Hospital bed-days(e)	297,053	282,078	26,741	605,872
Incident cancers	1,991	1,427	—	3,418
		(Per cent)		
Males				
Deaths	21.4	5.0	0.5	27.0
PYLL before age 70(d)	12.9	8.5	2.1	>23.5
Hospital episodes(e)	4.5	3.4	0.3	8.0
Hospital bed-days(e)	6.6	6.7	0.3	13.6
Incident cancers	25.3	6.0	—	31.3
Females				
Deaths	8.4	4.2	0.3	13.0
PYLL before age 70(d)	8.0	7.2	1.8	>17.1
Hospital episodes(e)	1.3	1.0	0.2	2.5
Hospital bed-days(e)	2.1	2.0	0.2	4.5
Incident cancers	7.2	5.2	—	12.4

(a) Net health impact of tobacco estimated by taking into account the protective effects of smoking against endometrial cancer, Parkinson's disease, ulcerative colitis and hypertension of pregnancy. These protective effects saved an estimated 159 lives in 1986 compared with 17958 deaths due to active tobacco smoking. The health effects of passive smoking are not included in the above estimates. Lung cancer deaths in 1986 due to passive smoking probably numbered around 146.

(b) Net health impact of alcohol estimated by taking into account its potential protective effects against ischemic heart disease and cholelithiasis. These protective effects saved an estimated 994 lives in 1986 compared with 6354 alcohol-caused deaths.

(c) Estimated health impact of illicit drugs. Includes all accidental drug poisoning and self-inflicted injury due to narcotics, sedatives and stimulants, whether use is licit or illicit. Does not include adverse health effects of licit drug use.

(d) Potential years of life lost (PYLL) before 70 years of age, adjusted for residual causes of death. PYLL due to different causes cannot be added. The total PYLL due to all drug causes will be greater than the sum of the PYLL due to each drug group.

(e) National levels of hospital use estimated using Western Australian data for public, private and psychiatric hospitals.

Source: Holman et al 1988

3.6.4 Other drugs

Pharmaceutical drugs (prescribed and over-the-counter) are a significant cause of morbidity and mortality in Australia. Excluding prescribed opiates, barbiturates and sedatives (included in deaths due to illicit drugs referred to above), other licit drugs caused an estimated 173 deaths in 1986, of which over 50 per cent were suicides and the remainder due to accidental poisoning (29 per cent) and adverse reactions (18 per cent) (ABS unpublished data).

Adverse reactions to drugs used for therapeutic purposes account for about 0.6 per cent of hospital bed-days (Health Department of Western Australia 1987).

A National Campaign Against the Misuse of Pharmaceuticals has been developed as part of the National Campaign Against Drug Abuse.

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4 Australia's health goals and strategies

4.1 Inequalities in health

In recent years it has become increasingly clear that the health of individuals, how they live, the conditions under which they do so, and the structures of society are closely connected. Advances in medical treatment and reduction of financial barriers to health care have not greatly reduced the inequalities in health status that relate to social conditions.

The Health Targets and Implementation Committee (1988) concluded that socioeconomic inequalities dominate any other explanations for these continuing health inequalities. It emphasised that the ability to choose healthy behaviours depends on the social and economic circumstances of individuals.

Lifestyle and behaviour based health promotion programs introduced in the 1970s and 1980s have failed to improve the health status or the risk avoidance behaviour of socioeconomically deprived groups as much as those of advantaged groups. This has led to a renewed emphasis on structural approaches to health, health promotion and disease prevention.

4.2 Health goals and targets

It has been recognised internationally that targeted and time-limited national health programs are needed to meet the problems described in the previous section. Health goals and targets are an integral part of the World Health Organization's Health for All strategy, which includes regular monitoring and evaluation of 12 global indicators (WHO 1981). WHO's success in eradicating smallpox and increasing world-wide levels of child immunisation are striking examples of the effectiveness of setting specific targets and striving to attain them (Mahler 1988). Setting goals and targets focuses resources and commitment and facilitates evaluation and monitoring of progress.

Within Europe, the strategy has led to 33 countries agreeing to 38 targets as steps on the path to Health for All (Ashton 1988). The United States has adopted five broad health goals and a set of specific and measurable objectives for 1990 within 15 priority areas (National Center for Health Statistics 1987).

In Australia, the Federal Government established the Better Health Commission in 1986. The Commission identified national health goals and targets for three priority areas: cardiovascular disease, nutrition and injury.

Box 4.1: Goals and targets

Goals are general statements concerning desirable health improvements and represent broad aspirations. Targets are specific and measurable, to make it possible to identify and monitor progress toward achievement of goals. Targets must take account of the mechanisms available for achieving goals and the availability of suitable data.

Health for All Australians **proposed goals and targets under the following detailed headings:**

- **Population groups**
  Socioeconomically disadvantaged people
  Aboriginal people
  Migrants
  Women
  Men
  Older people
  Children and adolescents
- **Major causes of illness and death**
  Heart disease and stroke
  Cancers (including lung, breast, cervical and skin)
  Injury
  Communicable diseases
  Musculoskeletal disease
  Diabetes
  Disability
  Dental disease
  Mental illness
  Asthma
- **Risk factors**
  Drugs (including tobacco smoking, alcohol misuse, pharmaceutical misuse or abuse, illicit drugs and substance abuse)
  Nutrition
  Physical inactivity
  High blood pressure
  High blood cholesterol
  Occupational health hazards
  Unprotected sexual activity
  Environmental health hazards

In 1987, the Australian Health Ministers' Conference set up the Health Targets and Implementation (Health for All) Committee to develop comprehensive health goals and targets for Australia in the year 2000 together with recommendations for prevention strategies and programs.

The Committee's report, *Health for All Australians*, proposed major national goals (and targets where appropriate) under three headings: population groups, major causes of illness and death, and risk factors (see Box 4.1).

Health for All Australians set targets for reduced differences in health status between advantaged and disadvantaged groups so that by the year 2000 the actual differences in health status between population groups and between geographical areas will be reduced by at least 25 per cent.

The report also set targets for major causes of illness and death, and risk factors. Some of these are examined in Section 4.4.

4.3 The National Better Health Program

The Commonwealth, State and Territory Governments established a National Better Health Program in 1988 based on the recommendations in *Health for All Australians*. The program focuses on five priority areas:

- improved nutrition
- prevention and control of high blood pressure
- cancer prevention (lung, skin, breast and cervical)
- improved injury prevention
- improved health of older people.

Costs of the national program are shared between the Commonwealth and the States and Territories, with both levels of government contributing $20.5 million each over the three years 1989–90 to 1991–92.

Funding is being provided for health promotion and prevention activities in the priority areas, including intervention projects, changes in public policy (especially in the non–health sectors) and structural change in health services. The interventions will be largely community based. The program will be supported by national communications, monitoring, evaluation and coordination components.

4.4 Monitoring progress towards goals and targets

Monitoring of progress toward the targets is an integral part of the National Better Health Program. Information on the current or baseline situation and, where available, on progress towards the targets is outlined in this section. In some areas performance indicators are not yet available.

4.4.1 Priority area: improved nutrition

Unbalanced nutrition is one of three major risk factors for premature death in Australia (the others are smoking and high alcohol consumption).

Diseases related to diet include coronary heart disease, high blood pressure and stroke, some cancers including bowel and breast cancers and mature onset diabetes. These disorders, which are also related to other lifestyle factors, are major causes of death in Australia. Other conditions in which diet plays a role include gallbladder disease, diverticulitis, iron deficiency anemia, dental caries, osteoporosis, obesity, overweight and under–nutrition.

Less active lifestyles compound the effect of overconsumption of food. A contributing factor to overconsumption is the increase in the energy density of the food supply because of the addition of fat and/or refined sugar to many foods. Unbalanced nutrition leading to nutritional disorders is also linked with excessive consumption of sodium and alcohol, and low intakes of complex carbohydrates and dietary fibre.

Health for All Australians set a goal of reducing the incidence and prevalence of diet–related health disorders. Seven nutrition targets to be achieved by the year 2000 were set (Figures 4.1 to 4.7) and a number of other targets specified for some conditions associated with diet.

Box 4.2: Overweight and obesity

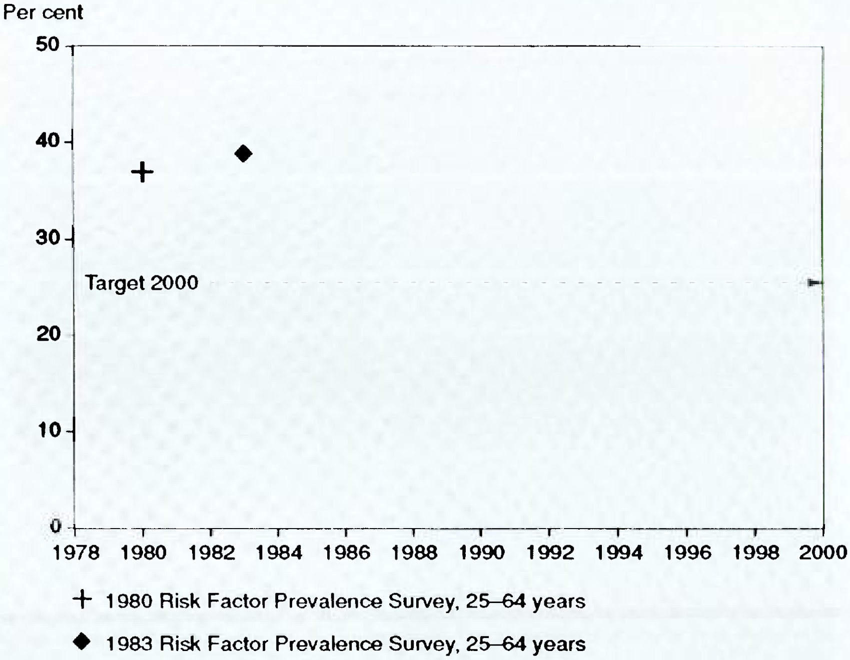
The Risk Factor Prevalence Studies conducted by the National Heart Foundation (1980; 1983) classified people as underweight, acceptable weight, overweight or obese, which is calculated as weight divided by the square of height.

Body Mass Index(kg/m2)

Descriptive term	Men	Women
Underweight	<19	<18
Acceptable weight	20–25	19–24
Overweight	26–30	25–30
Obese	>30	>30

Target: To reduce the prevalence of overweight and obesity from 38 per cent (1983) to 25 per cent or less in people aged 25–64 years by the year 2000.

Figure 4.1: Prevalence of overweight and obesity

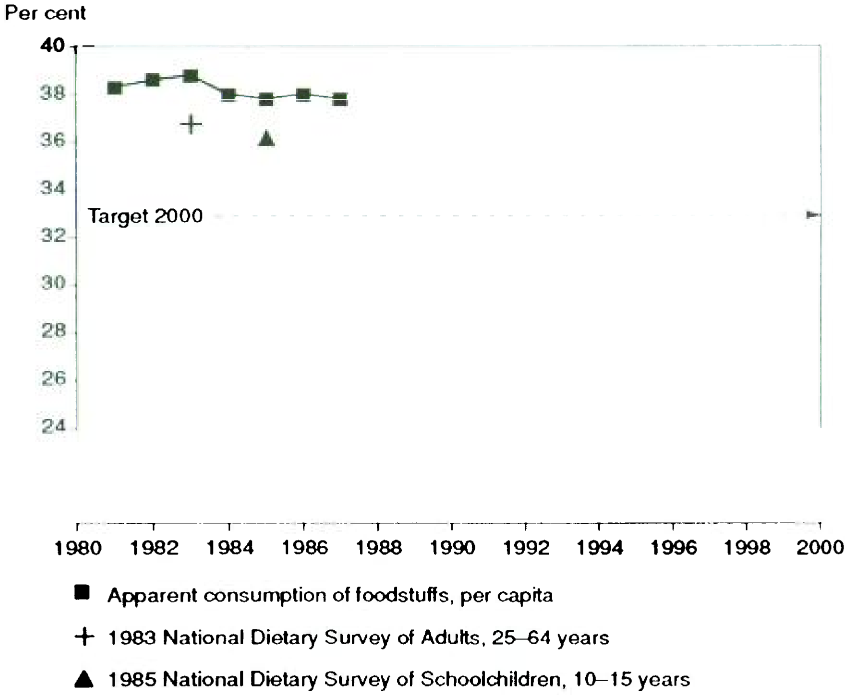


Source: National Heart Foundation 1980; 1983

Excess body weight is very common in Australia. For those aged 25 to 64 years 6 per cent of men and 9 per cent of women are obese, and a further 36 per cent of men and 26 per cent of women are overweight (Box 4.2). The prevalence of overweight and obesity is higher for men (42 per cent) than for women (35 per cent) and increases with age. Overweight and obesity are associated with a number of chronic diseases, including cardiovascular disease, and their reduction and prevention would greatly improve health.

Target: To reduce the contribution of fat to dietary energy from 38 per cent (1983–84) to 33 per cent or less by the year 2000

Figure 4.2: Contribution of fat to dietary energy

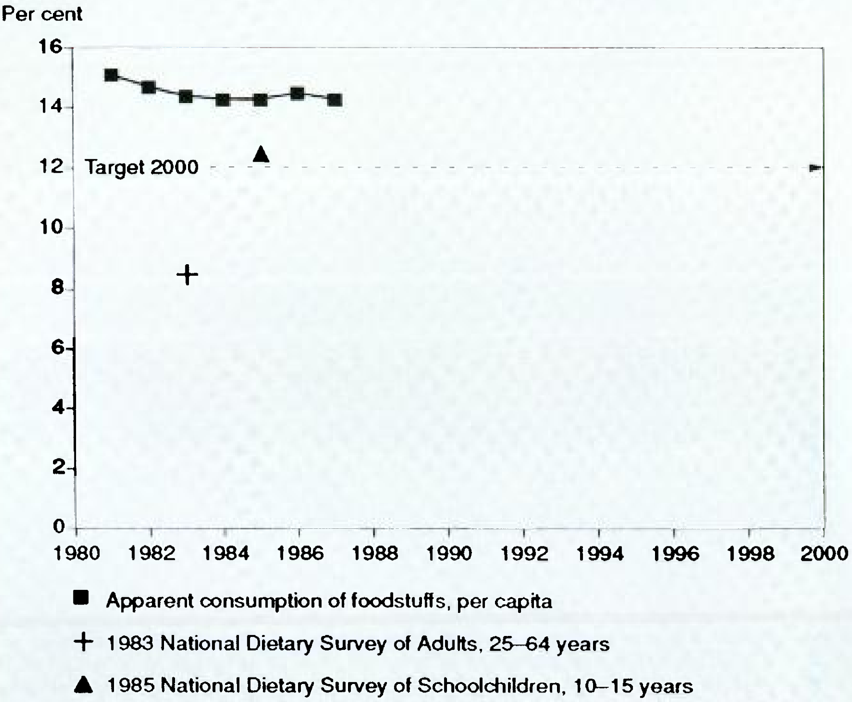


Source: Australian Bureau of Statistics 4306.0
Commonwealth Department of Community Services and Health 1987; 1989a

The target is based on production and import statistics from *Apparent consumption of foodstuffs and nutrients* (ABS 4306.0). These include estimates of fat on meat when sold and make no allowance for domestic trimming or cooking loss. They do allow for butchering waste. The 1983 National Dietary Survey of Adults collected information on fats and optional fat sources, eg type of milk used in cooking. It specifically sought information on trimming of meat (Commonwealth Department of Community Services and Health 1987).

Target: **To reduce the contribution of refined sugars to dietary energy from 14 per cent (1983–84) to 12 per cent or less by the year 2000.**

Figure 4.3: Contribution of refined sugars to dietary energy



Source: Australian Bureau of Statistics 4306.0
Commonwealth Department of Community Services and Health 1987; 1989a

The target is based on data from *Apparent consumption of foodstuffs and nutrients*. Estimates of intake from the National Dietary Survey are below the apparent consumption figures because the food composition tables used to derive refined sugar intake assume the maximum amount of natural sugars for each food. The refined sugar estimates are minimum values.

The biggest growth in sugar usage is in soft drinks and confectionery. Data on consumption at 15 to 24 years, missing at present, is therefore a very important component of the total picture.

Target: To reduce dietary sodium intake to 100 millimoles (2.3 grams) per day or less by the year 2000.

Figure 4.4: Dietary sodium intake

Source: National Health and Medical Research Council 1984

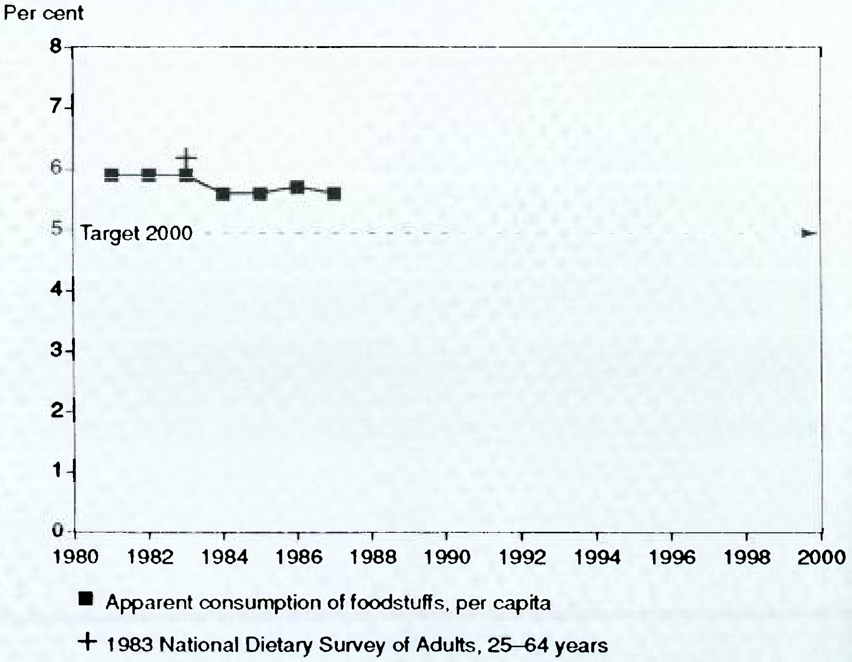
The sodium target is the only nutrition target on which there are no baseline data. There are no comprehensive national figures available on the average sodium intake of Australians. The target was based on a recommendation of a National Health and Medical Research Council working party on sodium in the Australian diet (NHMRC 1984).

Measurement of 24 hour urinary excretion is believed to provide the best estimate of sodium intake. In the few studies which have measured 24 hour sodium excretion levels of small groups of Australians, the average sodium intake of Australians appears to range from 130 mmol/day to over 200 mmol/day.

The Intersalt Study measured 24 hour sodium excretion in 52 centres in 36 countries. In 49 of these centres, median excretion rates ranged between 100 and 200 mmol/day. Four of the study groups (in Brazil, Papua New Guinea and Kenya) had median sodium excretion rates ranging from 1 to 51 mmol/day. The prevalence of hypertension was 5 per cent or less in these groups compared with 16 per cent in Australia (Intersalt Cooperative Research Group 1988).

Target: To reduce the contribution of alcoholic beverages to dietary energy from 6 per cent (1983–84) to 5 per cent or less by the year 2000.

Figure 4.5: Contribution of alcoholic beverages to dietary energy



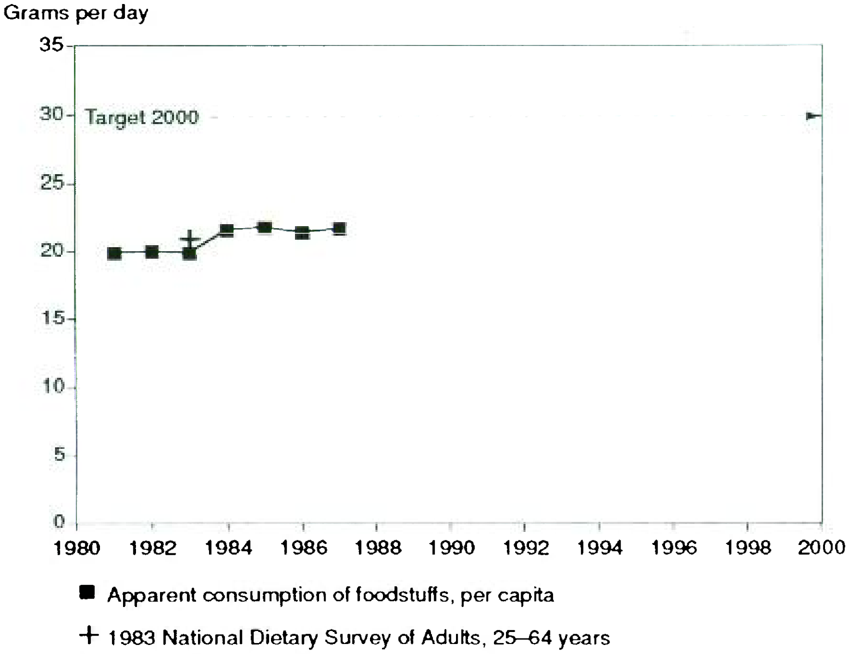
Source: Australian Bureau of Statistics 4306.0
Commonwealth Department of Community Services and Health 1987

The target is based on data from *Apparent consumption of foodstuffs and nutrients*. Although the data from the National Dietary Survey of Adults are similar to the ABS estimates, it is also well established that alcohol consumption is under-reported in survey collections.

A reduction in alcohol consumption by changing from standard to reduced alcohol products will not necessarily reduce the contribution of alcoholic beverages to dietary energy intake. Wine coolers (made from white wine and fruit juice), for example, have lower alcohol levels than wine, but energy is added with the fruit juice.

Target: To increase dietary fibre intake to 30 grams or more per day by the year 2000

Figure 4.6: Dietary fibre intake

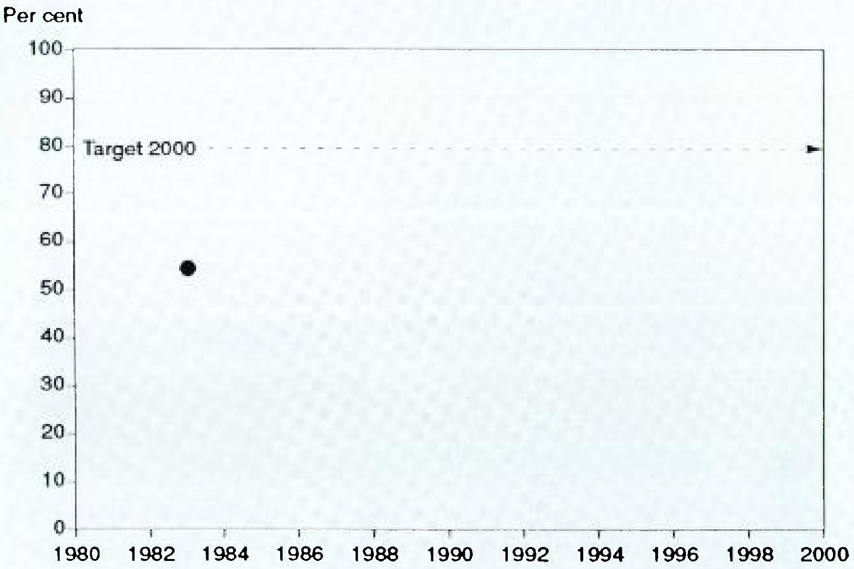


Source: Australian Bureau of Statistics 4306.0
Commonwealth Department of Community Services and Health 1987

The target needs careful interpretation for children and older people who have lower food intakes. The time series for dietary fibre intake is derived from *Apparent consumption of foodstuffs* data by applying edible portion factors and fibre content estimates to detailed apparent consumption figures for fruit, vegetables and grain.

Target: To increase the level of breastfeeding at three months of life to 80 per cent or more by the year 2000

Figure 4.7: Breast-feeding at three months of life



Source: Palmer 1985

The most recent national survey of infant feeding practices was carried out in 1983. The ABS National Health Survey in 1989–90 will obtain further data.

The prevalence of breastfeeding at hospital discharge is already high. The intention is to increase its duration.

As with other nutrition targets, there are large variations between socioeconomic groups and ethnic groups in breastfeeding practices.

4.4.2 Priority area: high blood pressure

High blood pressure is the most prevalent of all cardiovascular disease risk factors, affecting an estimated 2.7 million Australians, or 16 per cent of the population.

High blood pressure (diastolic >90 mm Hg pressure) is almost twice as prevalent in men as in women. Its prevalence rises rapidly with age.

The 1983 Risk Factor Prevalence Survey (National Heart Foundation 1983) found that 50 per cent of men and 32 per cent of women with high blood pressure (defined as ≥160/95) were not being treated for it. Untreated high blood pressure results in a seven-fold increase in the risk of stroke, a two-fold increase in myocardial infarction and a six-fold increase in congestive heart failure (Health Targets and Implementation Committee 1988).

Two equity target population groups disproportionately affected by high blood pressure are Aborigines and Torres Strait Islanders and the socioeconomically disadvantaged.

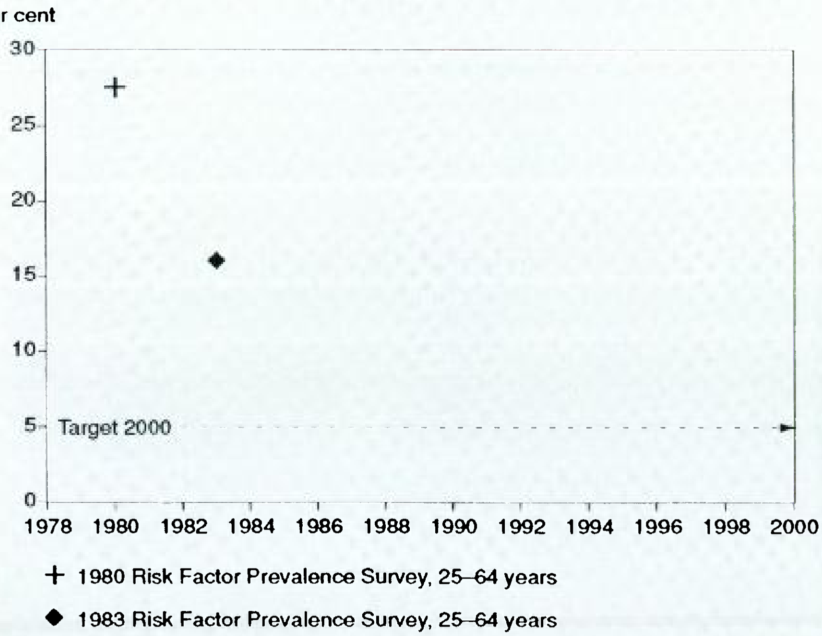
The following risk factors are known to be associated with high blood pressure:

- Obesity
- Physical inactivity
- High dietary salt intake
- High alcohol intake

Health for All Australians set a goal of reducing the incidence and prevalence of high blood pressure. Two blood pressure-related targets were set.

Target: To reduce the proportion of adults who persistently have a diastolic blood pressure greater than 90 mm Hg to 5 per cent or less by the year 2000.

Figure 4.8: Prevalence of high blood pressure



Source: National Heart Foundation 1980; 1983

The data points shown on Figure 4.8 come from the Risk Factor Prevalence Surveys (National Heart Foundation 1980; 1983), which measured blood pressure at a single visit for a sample of people aged 25–64 years resident in Australian capital cities. They relate to the prevalence, at screening, of diastolic blood pressure of 90 millimetres of mercury or more. No prevalence data are available relating to all adults in Australia or to levels of persistent high blood pressure, as referred to by the current target.

Target: To increase the proportion of adults who have had their blood pressure accurately measured within the last two years to 90 per cent or more by the year 1992.

No data are currently available to set a baseline for this target. The 1989 Risk Factor Prevalence Survey will provide data relating to this target.

4.4.3 Priority area: injury prevention

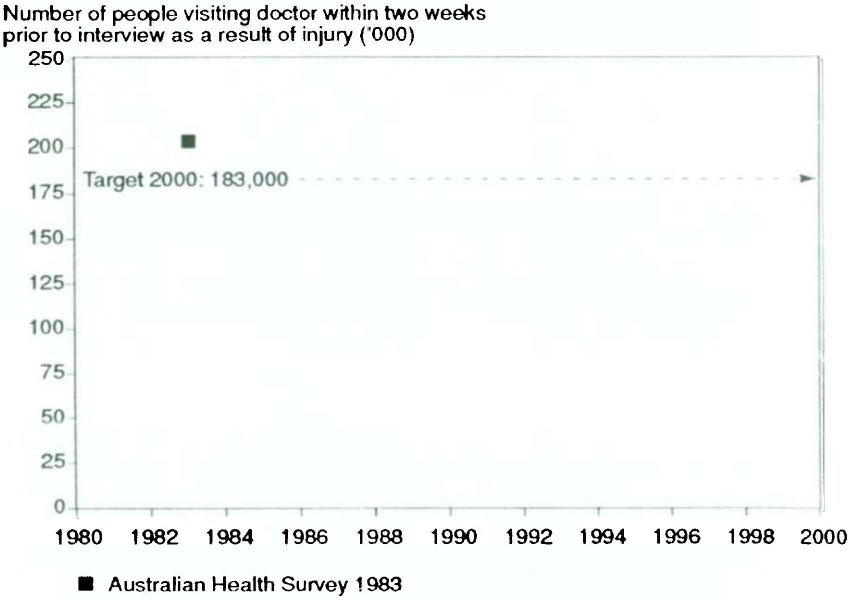
As mentioned in Section 3.1, injury is a major cause of preventable illness, disability and death in Australia. Moller and Vimpani (1985) estimated the total direct cost of medical treatment of injuries in Australia was $1.18 billion a year. The Better Health Commission (1986) estimated the annual total economic burden of injury in Australia at approximately $11 billion.

The great majority of injuries are preventable. Injury prevention programs offer enormous potential for reducing premature mortality and illness, and the related economic burden.

Health for All Australians set a goal of reducing preventable death and disability from injury and poisoning. Nine injury-related targets were set.

Target: To reduce the incidence of injury severe enough to require medical attention by 10 per cent or more by the year 2000.

Figure 4.9: Incidence of injury requiring medical attention



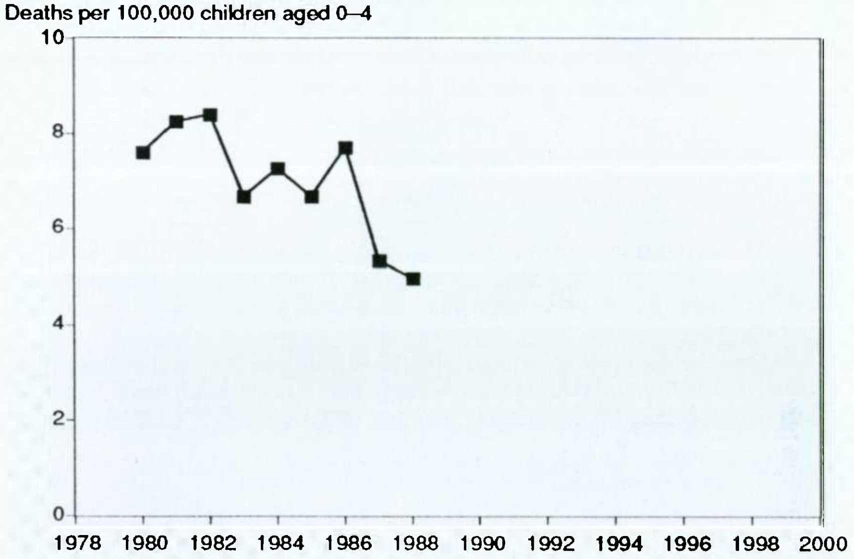
Note: 1983 data taken as baseline for calculating target.

Source: Australian Bureau of Statistics 4311.0

No routine statistical information on the reason for private doctor consultations is collected in Australia. The data in Figure 4.9 comes from the Australian Health Surveys conducted by ABS in 1978–79 and 1983 (ABS 4311.0). These estimated the number of Australians who consulted a doctor in relation to an injury within the two weeks prior to interview.

Target: To reduce early childhood deaths due to motor vehicle accidents (under revision)

Figure 4.10: Deaths due to road traffic accidents in children aged 0–4

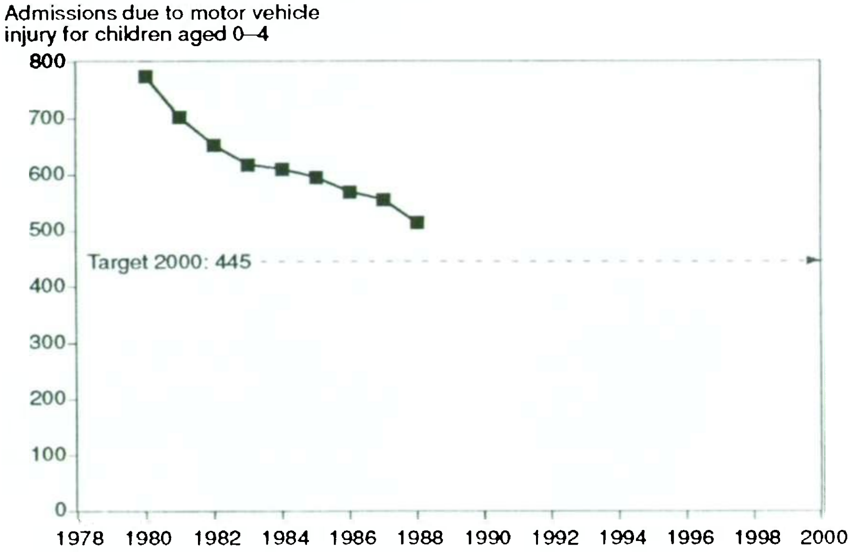


Source: Australian Bureau of Statistics 9405.0

There are currently of the order of 70 deaths a year among children aged 0–4 years due to motor vehicle accidents (ABS 9405.0). The target is under revision.

Target: **To reduce by 20 per cent or more the incidence of motor vehicle injury severe enough to require hospitalisation in children aged 0–4 years by the year 2000.**

Figure 4.11: Early childhood hospitalisation due to motor vehicle traffic accidents



Note: 1987 data taken as baseline for calculating target.

Source: Australian Bureau of Statistics 9405.0

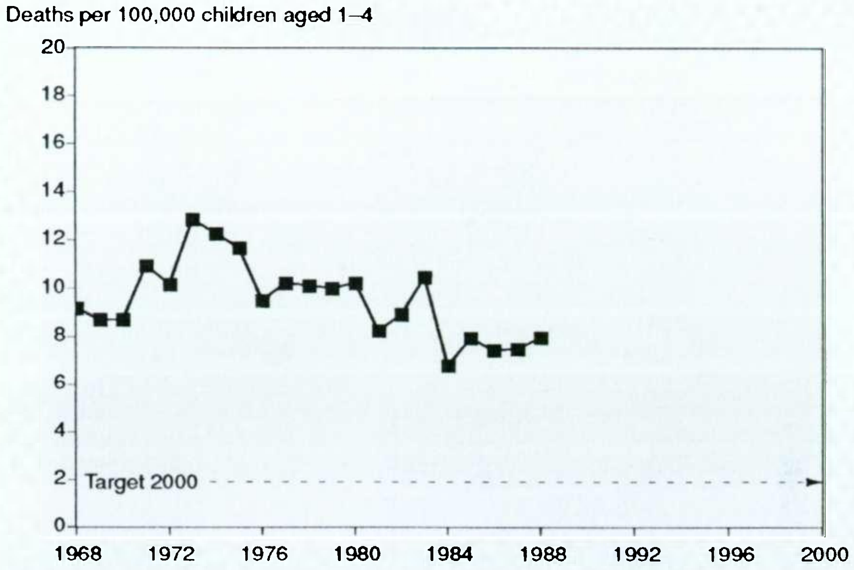
This target will be met by the year 2000 if current trends continue.

Target: **To reduce by 10 per cent or more by the year 2000 the incidence of motor vehicle injury, including whiplash, due to rear-end collisions involving passenger cars.**

No data are currently available to set a baseline for or to monitor this target.

Target: To reduce the death rate from drowning to 2 per 100,000 a year or less in children aged 1–4 years by the year 2000.

Figure 4.12: Drowning in children aged 1–4



Source: Australian Bureau of Statistics unpublished

Pool drowning is the major cause of death in children under school age. The rates vary from very high in New South Wales, Victoria and Queensland (over 10 pool fatalities per 100,000 at risk) to negligible in the Australian Capital Territory (0.34 pool fatalities per 100,000) (Better Health Commission 1986). The variation appears to be related to the different legal requirements for fencing around pools.

The target of two deaths per 100,000 children aged 1–4 years represents a considerable reduction on the 1988 rate of 8 per 100,000. However, the target is considered to be realistic in view of the levels which have been achieved in some Australian communities.

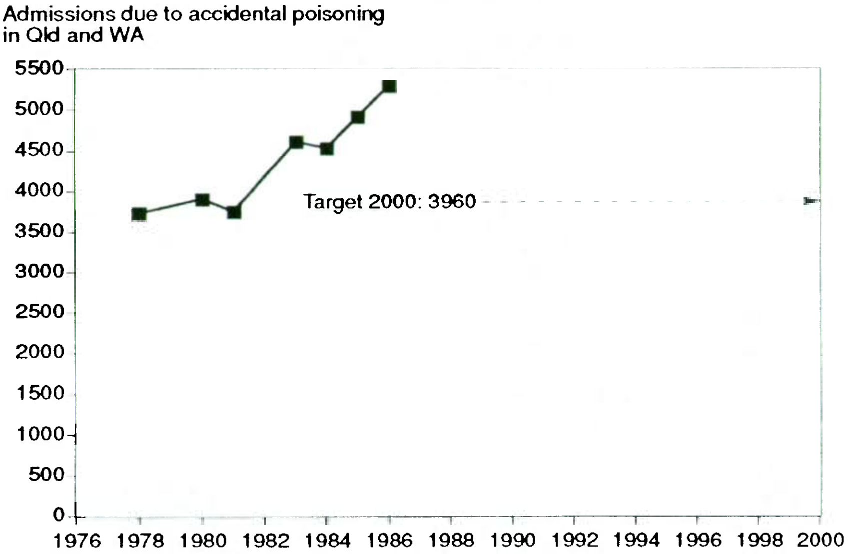
Target: To reduce fractures related to playground equipment by 20 per cent or more by the year 2000.

Hospital casualty department data collected by the National Injury Surveillance and Prevention Project (Vimpani and Hartley 1988) indicates that playground equipment is a major source of fall injuries in younger children and that two–thirds of all playground injuries are due to falls on to hard under–surfaces. Other playground equipment hazards identified include excessive fall height and lack of guard rails. The national playground standard of the Standards Association of Australia has been redrafted to take account of these hazards.

The injury surveillance data collection is not comprehensive enough to provide indicative incidence data for monitoring this target.

Target: To reduce by 25 per cent by the year 2000 the incidence of poisoning severe enough to require hospitalisation.

Figure 4.13: Hospitalisation caused by poisoning



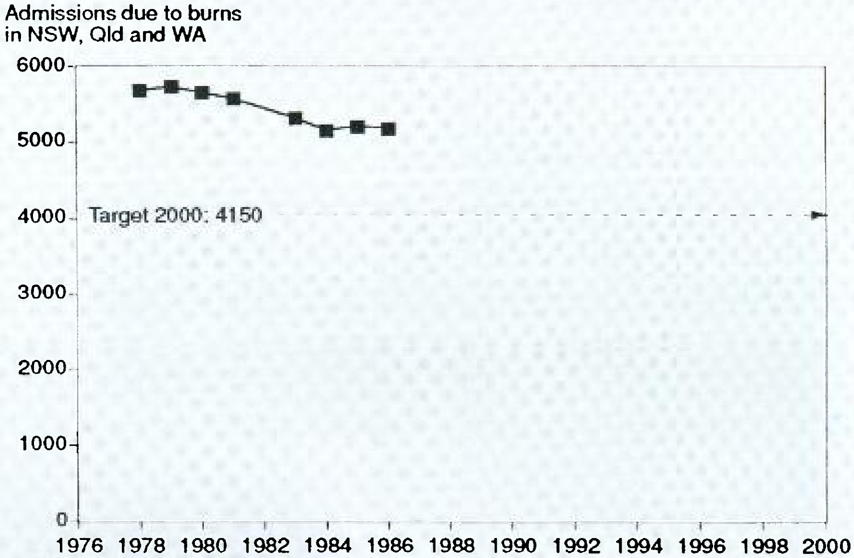
Note: 1986 data taken as baseline for calculating target.

Source: Australian Bureau of Statistics 4303.3
Health Department of Western Australia 1979, 1981, 1982, 1984 to 1987

The interim data in Figure 4.13 relate to total admissions to public and private hospitals in Queensland and Western Australia where the principal diagnosis was accidental poisoning. The baseline data will be revised to include admissions from all States and Territories when available.

Target: To reduce by 20 per cent by the year 2000 the incidence of burns and scalds severe enough to require hospitalisation.

Figure 4.14: Hospitalisation caused by burns and scalds



Note: 1986 data taken as baseline for calculating target.

Source: Australian Bureau of Statistics 4306.1, 4303.3
Health Department of Western Australia 1979 to 1982, 1984 to 1987

The interim data in Figure 4.12 relate to total admissions to public and private hospitals in New South Wales, Queensland and Western Australia where the principal diagnosis was burns and scalds. The baseline data will be revised to include admissions from all States and Territories when available.

4.4.4 Priority area: preventable cancers

Health for All Australians identified four cancers—lung cancer, breast cancer, cancer of the cervix and skin cancer—for which known prevention and early detection methods could prevent one quarter of all cancer deaths. Table 4.1 shows the contribution of the preventable cancers to total mortality and total cancer mortality for 1988.

Higher risk population sub-groups for these preventable cancers are listed in Box 4.3. Major risk factors are shown in Box 4.4. For each cancer, they are listed in order of priority based on current epidemiological consensus (Giles, Armstrong and Smith 1987; Anti-Cancer Council of Victoria 1985; New South Wales Cancer Registry 1988).

Table 4.1: Preventable cancers and their contribution to mortality in females, 1988

	Preventable cancer deaths		
Type of cancer	*Number*	*As percentage of cancer deaths*	*As percentage of total deaths*
Lung	6,169	20.9	5.1
Breast	2,348	18.4	4.3
Skin	1,003	3.4	0.8
Cervical	350	2.7	0.6
Total	**9,870**	**33.4**	**8.2**

Source: Australian Bureau of Statistics 3302.0

Box 4.3: Higher risk population subgroups

Lung cancer
- **Blue collar occupations**
- **Men and women over age 50**

Breast cancer
- **Nulliparous women**
- **Obese women**
- **Women aged over 50 years**
- **Women who have a direct relative with breast cancer**

Cervical cancer
- **Women having early first intercourse**
- **Women over age 50**

Skin cancer
- **People in lower latitudes**
- **People with fair skin**
- **Outdoor occupations**

Box 4.4: Major risk factors for preventable cancers

Lung cancer

- **Tobacco smoking**
- **Occupational exposure to carcinogens (eg asbestos)**
- **Air pollution**

Breast cancer

- **Family or personal history of the disease**
- **Obesity**
- **Benign breast disease**
- **Nulliparity or late age at first full term pregnancy**

Cervical cancer

- **Early age at first sexual intercourse**
- **Sexual intercourse with many partners**
- **A male partner having intercourse with a number of other female partners**
- **Human papilloma virus (HPV), a sexually transmitted infectious agent**

Skin cancer

- **Fair skin which burns rather than tans**
- **Fair or red hair and blue eyes, living in high sun exposure areas**
- **Mean annual hours of bright sunlight at place of residence**
- **Intermittent recreational exposure**
- **Number and type of moles a person has (eg dysplastic moles show increased risk)**

Lung cancer

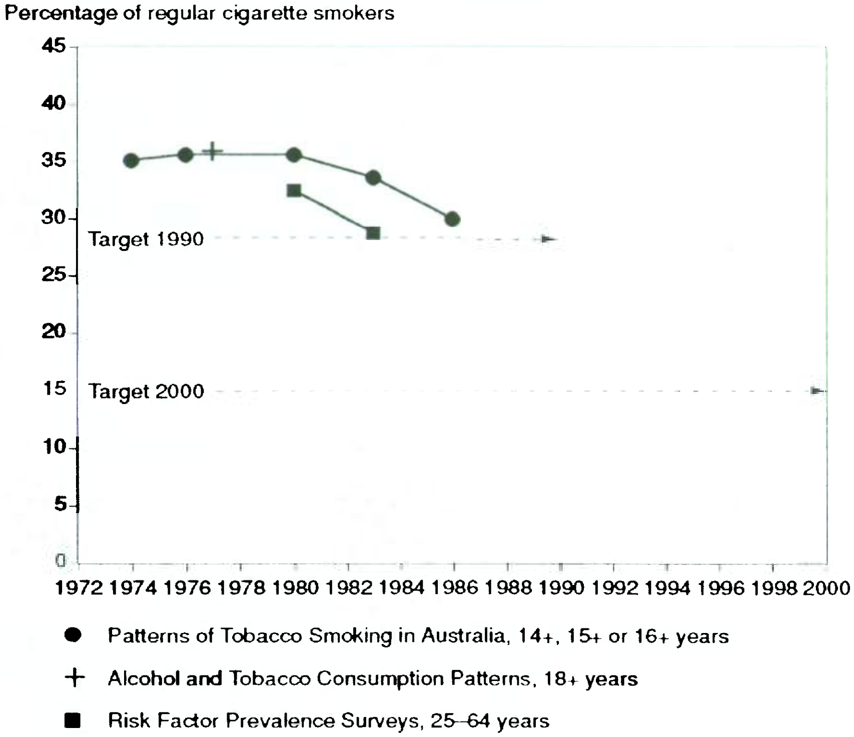
Health for All Australians set five lung–cancer related goals:

- To reduce the incidence of death from lung cancer.
- To prevent the onset of smoking in non–smokers, especially children.
- To reduce the number of smokers.
- To reduce the exposure of smokers to tobacco derived carcinogens.
- To reduce involuntary exposure to tobacco smoke.

The following four targets were set also.

Target: To reduce the prevalence of smokers from 33 per cent (1983) to 28 per cent or less by the year 1990 and to 15 per cent or less by the year 2000.

Figure 4.15: Prevalence of regular smokers 15 years and over

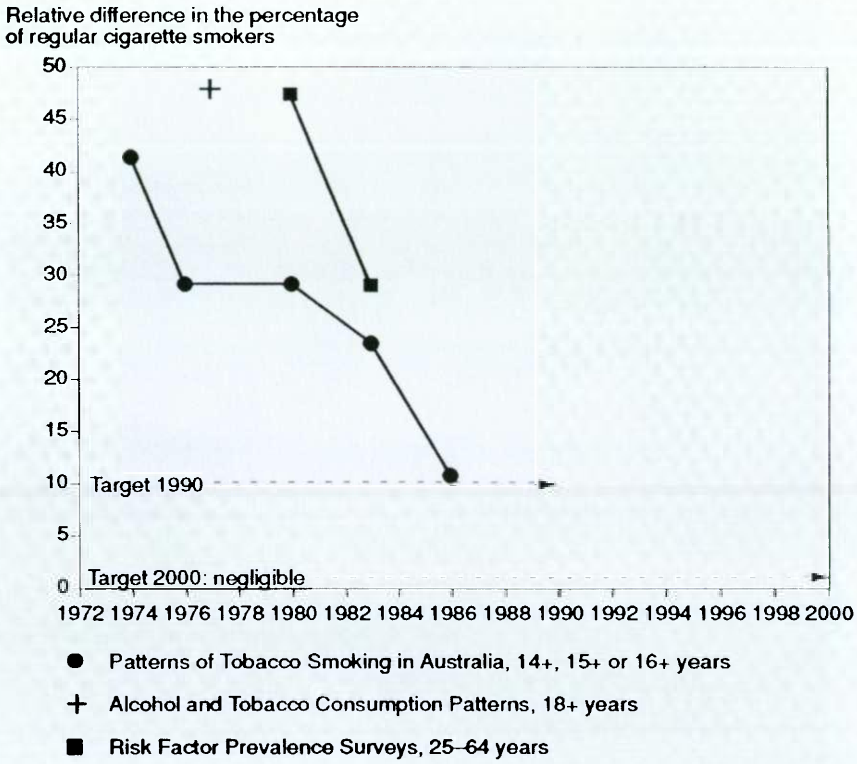


Source: Gray and Hill 1975; 1977
Hill and Gray 1982; 1984
Hill 1988
Australian Bureau of Statistics 4308.0
National Heart Foundation 1980; 1983

The prevalence of tobacco smoking has been declining steadily since 1980, according to two national surveys conducted by ABS and the Anti–Cancer Council of Victoria. It is likely that the 1990 target has been achieved, and if the trend continues, the year 2000 target will also be achieved.

Target: **To reduce the difference in prevalence of smoking between males and females from 23 per cent to 10 per cent or less by the year 1990 and to a negligible figure by the year 2000.**

Figure 4.16: Difference in prevalence of male and female regular smokers



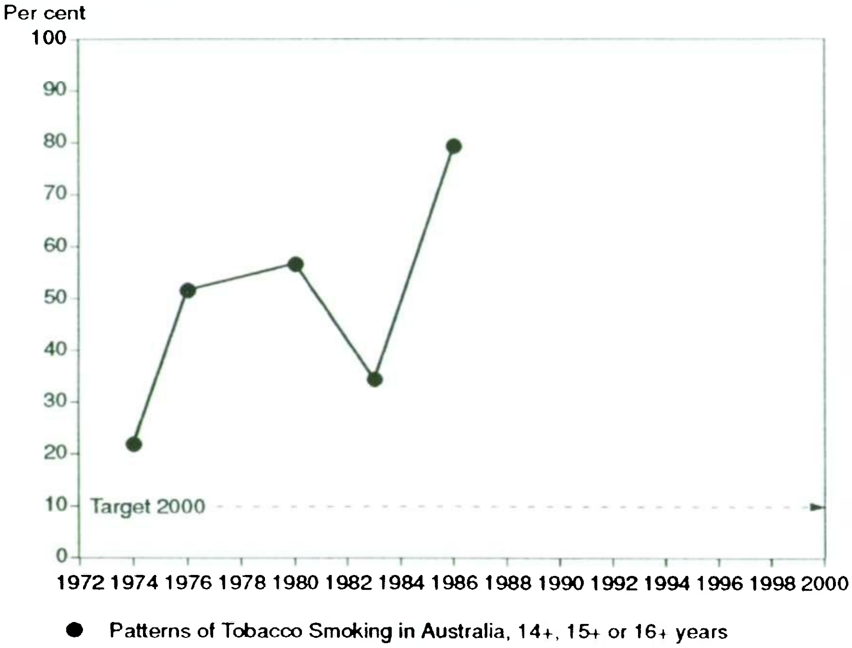
Source: Gray and Hill 1975; 1977
Hill and Gray 1982; 1984
Hill 1988
Australian Bureau of Statistics 4308.0
National Heart Foundation 1980; 1983

The prevalence of tobacco smoking in males declined from 40 per cent in 1980 to 33 per cent in 1986 compared with a decline from 33 per cent to 29 per cent in females over the same period (Hill, White and Gray 1988). It is likely that the 1990 target has been achieved, and if the trend continues, the year 2000 target will also be achieved. It is hoped that the prevalence of female smoking will begin to decrease faster.

Target: **To reduce the difference in the prevalence of smoking between upper white collar and lower blue collar males from 34 per cent (1983) to 10 per cent or less by the year 2000.**

Figure 4.17: Difference in prevalence of regular male smokers by occupational grouping

Relative difference in the prevalence of regular cigarette smokers between upper white collar and lower blue collar men

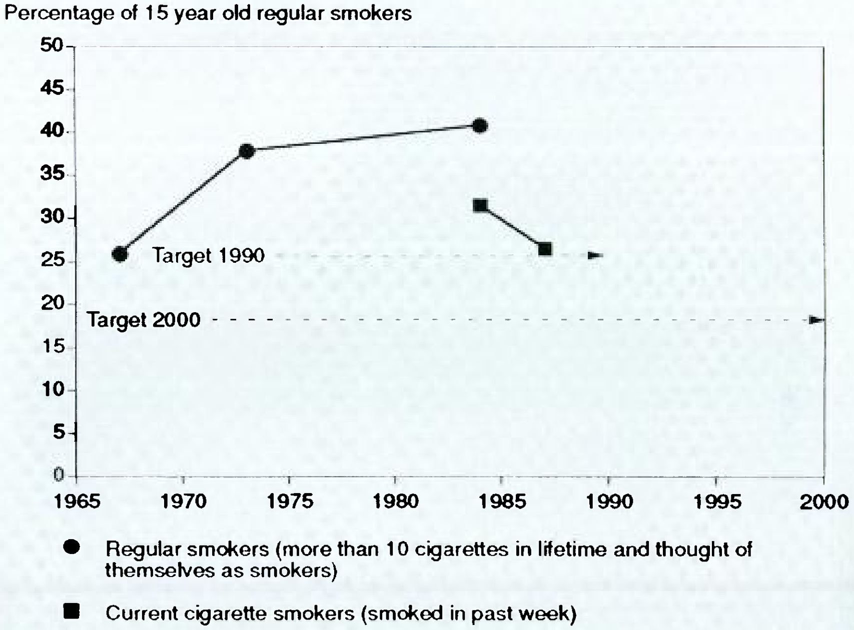


Source: Gray and Hill 1975; 1977
Hill and Gray 1982; 1984
Hill 1988

National data from surveys conducted by the Anti-Cancer Council of Victoria indicate that the differential smoking prevalence between male upper white collar and lower blue collar occupational groups is increasing. Smoking in both groups has declined, but the decline among upper white collar workers has been substantial while the decrease among the lower blue collar occupations has been very small. As a result, the difference in prevalence has been moving away from the target of a 10 per cent difference by the year 2000.

Target: **To reduce the prevalence of regular smokers from 31 per cent (1984) to 26 per cent or less for adolescents aged 15 years by the year 1990 and 18 per cent or less by the year 2000.**

Figure 4.18: Prevalence of 15 year old regular smokers



Source: Hill et al 1987; 1990

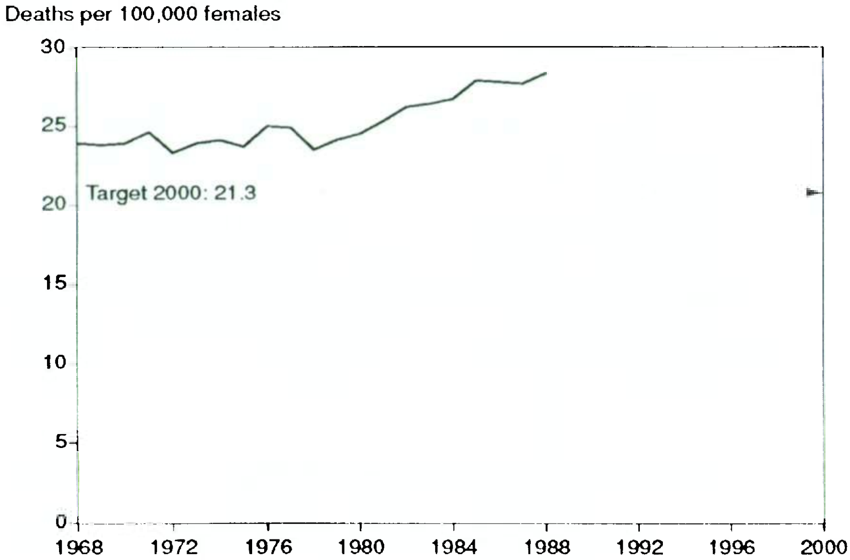
There are quality and compatibility problems with the existing data on smoking behaviour among adolescents, creating difficulties in comparing studies against the baseline rate of 31 per cent, which is the mean 1984 Australian Cancer Society male and female rates. New South Wales, South Australia and Australian Capital Territory surveys suggest that males are closer to the target than females, although further data is required to assess the trends.

Breast cancer

Health for all Australians set a goal of reducing illness and death from breast cancer. Two targets were set also.

Target: To reduce the death rate from breast cancer by 25 per cent or more by the year 2000.

Figure 4.19: Breast cancer death rates



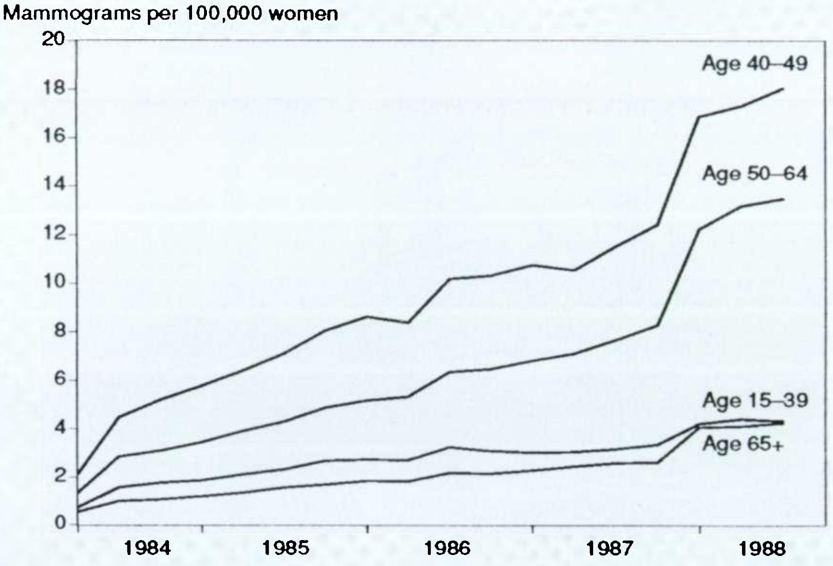
Note: 1988 data taken as baseline for calculating target.

Source: Australian Bureau of Statistics unpublished

The age–standardised death rate for female breast cancer in Australia shows an upward trend between 1968 to 1988. The target will not be met if this trend continues. A breast cancer screening program announced while this report was in preparation aims to reduce the breast cancer death rate by 30 per cent in the target population and by around 15 per cent in the total female population.

Target: To increase participation in breast cancer screening to 70 per cent or more of eligible women by the year 1995.

Figure 4.20: Mammography rates by age group, 1984 to June 1988



Note: Data plotted on a quarterly basis.

Source: Health Insurance Commission unpublished

Screening mammography, unlike diagnostic mammography, does not attract a Medicare rebate. However, a large proportion of diagnostic mammography services are believed to be for screening purposes, and so Medicare data can be used to estimate trends in the use of screening mammography by Australian women (Figure 4.20). Because the Medicare data relates to services, not individual women, the percentage of women participating in screening can not be monitored using this data However, the ABS National Health Survey in 1990 is collecting data which will be used to establish a baseline for this target.

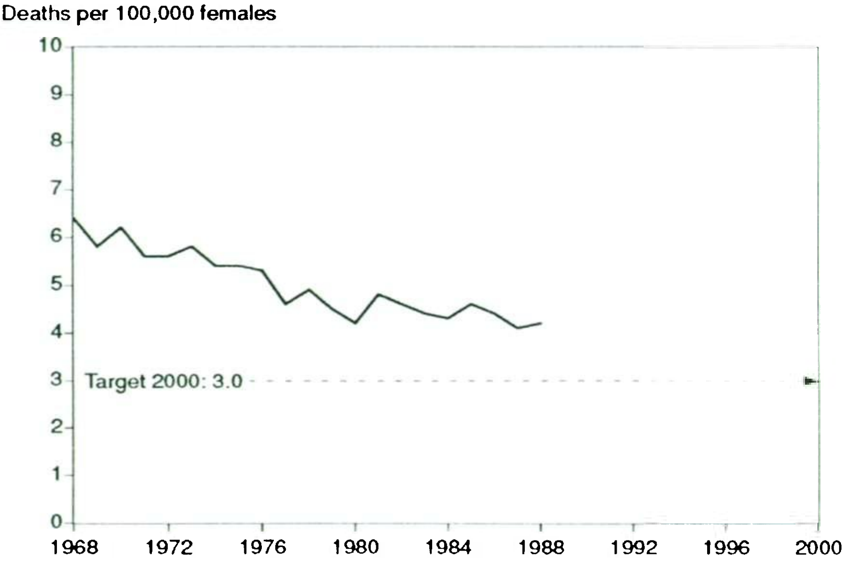
Use of mammography services increased in all age groups between 1984 and 1988, particularly in the third quarter of 1987 and in the 40 to 64 year age group. In 1988, there were 90 breast cancer deaths per 100,000 women aged 65–69 compared with 21 per 100,000 thousand women aged 40–44, but despite the fact that the death rate is highest in older women, women aged 65 years and over make the least use of mammography services.

Cervical cancer

Health for All Australians set a goal of reducing the incidence of death from cervical cancer

Target: To reduce the death rate from cervical cancer by 30 per cent or more by the year 2000.

Figure 4.21: Cervical cancer death rate



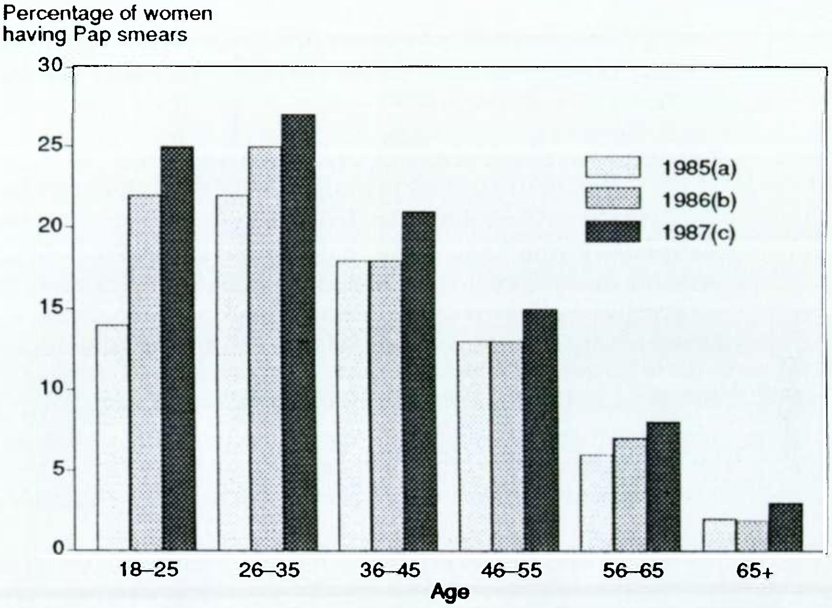
Note: 1988 data taken as baseline for calculating target.

Source: Australian Bureau of Statistics unpublished

There is a definite downward trend in the age–standardised death rate for cervical cancer. The target of 2.4 deaths per 100,000 seems achievable in the light of this trend, and even further reductions may be possible if a national screening program is organised.

Target: To increase triennial participation in Pap smear screening to 50 per cent or more of women aged 20–69 by the year 1990, to 75 per cent by the year 1995 and to all but a negligible number by the year 2000.

Figure 4.22: Cervical cancer screening by age group, 1985 to 1987



(a) Population comprises persons who had any Medicare claim in the three years to March 1987.
(b) 1986 census (ABS).
(c) Data from Health Insurance Commission.

Note: Estimations are based on a 10 per cent sample of medicare claims.

Source: Health Insurance Commission

Cervical cancer screening rates for Australian women have been estimated using Medicare data on rebate claims for Pap smear tests. These are minimum estimates because in Victoria, for example, more than 70 per cent of smears are processed and funded by the Victorian Cytology Gynaecological Service (VCGS) rather than Medicare.

The proportion of women having Pap smears increased for all age groups between 1985 and 1987. The rate is highest for child-bearing age groups, whereas cervical cancer death rates are highest in the over–50 age group.

The target relates to triennial participation in Pap smear screening and cannot be monitored using the data shown in Figure 4.21 but other data are being developed for this purpose.

Skin cancer

Health for All Australians set two skin cancer goals:

- To reduce illness and death from melanoma and other skin cancers through early detection.
- To reduce the incidence of all forms of skin cancer through protection against ultraviolet exposure.

Two skin cancer–related targets were set.

Target: To reduce exposure to ultraviolet radiation by 20 per cent or more by the year 1993 and by 40 per cent or more by the year 2000.

Target: To reduce exposure to ultraviolet radiation by 50 per cent or more for people at high risk of skin cancer by the year 1993 and by 90 per cent or more by the year 2000.

Some work has been done to measure ultraviolet radiation levels for specific locations in Australia (Marks and Selwood 1985), but no study has measured population exposure to ultraviolet radiation. Monitoring of targets will require development of new data collections.

4.4.5 Priority area: health of older people

The health of older people was chosen as one of the initial priorities for the National Better Health Program because:

- there are serious and prevalent health problems with largely preventable components;
- age is the single greatest independent predictor of illness. Older people utilise medical and hospital services both absolutely and relatively more than all other age groups combined;
- the proportion and number of older Australians is growing

A goal of reducing the percentage of older Australians with health problems precluding their independence was set, but no specific targets were set for this priority area. However, targets for the other four priority areas of the National Better Health Program are all highly relevant to the health of older people.

4.5 Other national health initiatives

Several other major national programs are being used to develop health–related goals and targets.

4.5.1 AIDS

A national approach to the health and social problems caused by AIDS has been developed and has the agreement of all Australian Health Ministers. It is outlined in the *National HIV/AIDS strategy* which states the following:

> Recognising that the human immunodeficiency virus may impinge on the lives of all Australians, the National HIV/AIDS Strategy aims to:
>
> - eliminate transmission of the virus; and
> - minimise the personal and social impact of HIV infection. (Commonwealth Department of Community Services and Health 1989b).

Program components include education, prevention, treatment, care and counselling, access and participation, research, and international cooperation. No specific targets have been set.

The current status of the AIDS epidemic is examined in section 3.4.

4.5.2 Women's health

Development of a National Women's Health Policy began in 1987 and after wide-ranging consultations the report *National Women's Health Policy: advancing women's health in Australia* was produced (Commonwealth Department of Community Services and Health 1989c). The policy was endorsed in principle by all Health Ministers and was launched by the Prime Minister in April 1989.

The policy identified several priority health issues for women:

- reproductive health and sexuality
- health of ageing women
- women's emotional and mental health
- violence against women
- occupational health and safety
- the health needs of women as carers
- the health effects of sex role stereotyping on women.

The policy led to establishment of the National Women's Health Program, the costs of which are shared between the Commonwealth and the States and Territories. The program's goal is to improve the health and well-being of all women in Australia, with a focus on those most at risk, and to encourage the health system to be more responsive to the needs of women.

The objective of the National Women's Health Program is to provide funding for the promotion of primary health care for women, focusing on improvements relating to the identified priority areas. The Program incorporates funding for women's community health services, an education and information strategy, and training and education of health care providers.

4.5.3 Aboriginal health

In 1987, all Federal, State and Territory Health and Aboriginal Affairs Ministers agreed on the need for a National Aboriginal Health Strategy to address the health disadvantages experienced by Aborigines and Torres Strait Islanders.

A working party, which had a majority of Aborigines and Torres Strait Islander members, was established to develop the strategy. It reported to the Ministers in early 1989 (National Aboriginal Health Strategy Working Party 1989). The proposed strategy involved a partnership between Aboriginal community groups and governments at all levels to tackle the problems. The report has been accepted and Federal, State and Territory governments are currently finalising arrangements for implementation.

4.5.4 Drug abuse

The National Campaign Against Drug Abuse (NCADA) was established in April 1985 after a special Premiers' Conference on drugs.

It is jointly funded by Commonwealth, State and Territory governments, and is coordinated by a Ministerial Council on Drug Strategy, comprising health and law enforcement Ministers.

The program places a major emphasis on reducing demand for drugs through education, treatment and rehabilitation programs. Effort is directed also at the general community, with special attention to young people, Aboriginal people, women, persons of non-English speaking background, prisoners and intravenous drug users.

The goal of the program is:

To minimise the harmful effects of drugs on Australian society through:

- promoting greater awareness and participation by the Australian community in confronting the problems of drug abuse;
- achieving conditions and promoting attitudes whereby the use of illegal drugs is less attractive and a more responsible attitude exists towards those drugs and substances which are both legal and readily available;
- improving both the quantity and quality of services provided for the casualties of drug abuse;
- directing firm and effective law enforcement efforts at combating drug trafficking, with particular attention to those who control, direct and finance such activities;
- supporting international efforts to control the production and distribution of illegal drugs; and
- seeking to maintain, as far as possible, a common approach throughout Australia to the control of drug use and abuse.

Quantitative targets for the campaign were being developed as this edition of *Australia's Health* was prepared. As part of the process of setting targets, research is being commissioned to establish whether there is a methodological basis for setting quantifiable targets and attributing causality to NCADA activities.

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5 Health services in Australia

The focus of this chapter is the supply, use and costs of services directly provided to improve or maintain the health of Australians, and the labourforce that provides these services. Most of the discussion relates to hospital and other institutions, and services provided by professionals outside institutions. In general, 'alternative' treatment modalities and remedies are excluded, as are activities and expenditure undertaken outside the health sector to improve health—provision of clean water, better roads etc. These issues were reviewed in *Australia's health 1988* (AIH 1988a).

5.1 Use of hospitals and other related institutions

Responsibility for the provision of institutional health care within Australia is divided between the Commonwealth, the various States and Territories and the private sector. Consequently, Australia does not have a single system, but rather public and private systems within each State and Territory and a number of separate Commonwealth funded programs. There are considerable differences between these systems in organisation and structure, and in the degree of integration between the hospital and other health care sectors (AIH 1988a).

The cost of health institutions, and the services they provide, account for about 55 per cent of all recurrent health expenditure. As a result, public policy has tended to focus on their operations and performance.

5.1.1 Use of acute hospitals

Acute hospitals mainly provide care for the treatment of short term, or acute, episodes of illness. Care is provided by both the public and private sectors in all States and Territories.

In 1987–88 there were 725 public acute hospitals (including Department of Veterans' Affairs hospitals but excluding dental hospitals) with approximately 64,000 available beds (AIH unpublished). In 1988 there were also 335 private hospitals with approximately 22,000 available beds (Commonwealth Department of Community Services and Health 1989a).

Between 1985–86 and 1987–88 overall bed numbers remained nearly constant while population increased by 1.8 per cent a year. As a result, beds per thousand population fell by about 1.7 per cent a year over the two-year period (Table 5.1) (Harvey and Mathers 1988; AIH unpublished). The reduction in the numbers of acute beds per thousand population began in the early 1980s (Figure 5.1), but Australia still has a relatively high supply of acute hospital beds, with

Table 5.1: Use of acute hospitals(a) 1985–86 and 1987–88

	Number			*Rate (per '000 population)*		
	1985–86	*1987–88*	*Change*	*1985–86*	*1987–88*	*Change*
	('000)	*('000)*	*(%)*			*(%)*
Average available beds						
Public	64.7	64.5	–0.3	4.09	3.93	–3.9
Private	21.1	21.3	1.0	1.33	1.30	–2.6
Total	85.8	85.8	—	5.42	5.23	–3.6
Occupied bed–days						
Public	16,891	17,095	1.2	1,068	1,043	–2.4
Private	4,776	4,531	–4.9	301	276	–8.3
Total	21,657	21,626	–0.1	1,369	1,319	–3.7
Separations						
Public	2,466	2,622	6.3	156	160	2.5
Private	872	878	0.7	55	54	–2.9
Total	3,338	3,500	4.8	211	213	1.1
Average length of stay	*(Days)*	*(Days)*				
Public	6.9	6.5	–4.8			
Private	5.5	(b)5.2	–5.6			
Total	6.5	6.2	–4.7			
Occupancy	*(%)*	*(%)*				
Public	71.5	72.4	0.9			
Private	61.8	58.1	–3.8			
Total	69.2	68.9	0.3			
Population	*('000)*	*('000)*				
Number	15,817	16,397	3.7			

(a) Public hospital data include all public acute hospitals and Commonwealth Department of Veterans' Affairs hospitals. Private hospitals include both private acute and private psychiatric hospitals.

(b) Estimated by the Australian Institute of Health.

Notes: The number of admissions was estimated as equal to the number of discharges plus transfers plus deaths (ie number of separations).

Source: Commonwealth Department of Community Services and Health 1989b, 1989c; Mathers and Harvey 1988 (Box 5.1)

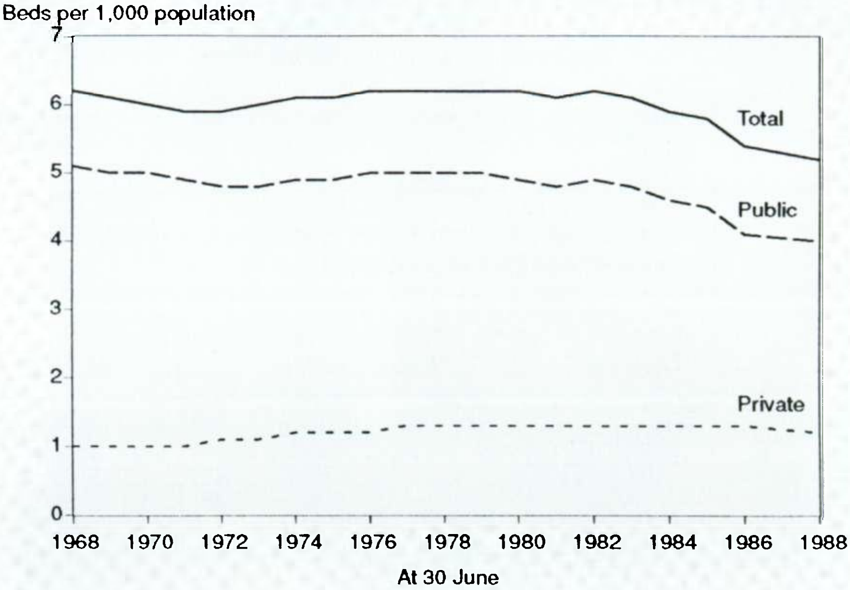
more than 5.1 beds per thousand population. It is likely that the level will continue to fall; some States plan to reduce the ratio to about four beds per thousand population, and even this is not low by international standards. In Canada the targeted supply is 2.9 to 4.0 beds per thousand while England already has fewer than four beds per thousand. Some health maintenance organisations in the United States plan on the basis of two beds per thousand (AIH 1988a).

The health system has responded to a reduction in bed capacity by more efficient use of the remaining beds, including reducing length of stay of patients and expanding alternatives such as day surgery.

Between 1985–86 and 1987–88 there was a small percentage growth (0.5 per cent a year) in the numbers of beds in private hospitals (Harvey and Mathers 1988; AIH unpublished). This was lower than population growth and as a result the numbers of private hospital beds per thousand fell by 1.3 per cent a year (AIH unpublished).

Admission rates increased steadily during the 1970s (Figure 5.2). The trend during the 1980s was not consistent, with a reduction in rates followed by growth and then a period of stabilisation.

Figure 5.1 Provision of acute hospital beds, 1967–68 to 1987–88



Source: Mathers and Harvey 1988

These changes may represent normal variations in the underlying demand for acute hospital services. Between 1985–86 and 1987–88 the number of admissions to public hospitals grew by 3.1 per cent a year and the admission rate per thousand population grew by 1.3 per cent (Mathers and Harvey 1988; AIH unpublished). The data for private hospitals in 1987–88 are less reliable. It is estimated, however, that the number of admissions to private acute hospitals increased by 0.3 per cent a year and the admission rate per thousand population fell by 1.4 per cent. This suggests that over the two-year period there was a transfer of demand from the private to the public sector (Box 5.2).

The number of inpatient bed-days per thousand population has continued the decline that began in the mid 1970s. The number of inpatient bed-days per thousand population fell between 1985–86 and 1987–88 by 1.2 per cent a year in public acute hospitals and by an estimated 4.2 per cent in private acute hospitals (Mathers and Harvey 1988; AIH unpublished). The reduction in the per capita utilisation of acute hospitals, as measured by bed-days, was due mainly to reductions in the average time patients stay in hospital in both public and private hospitals. Average length of stay has fallen from 10.3 days in 1965–66, to 6.5 days in 1985–86 and 6.2 days in 1987–88. The trend to shortened length of stay in acute hospitals is world wide; there are a variety of reasons, including changes in medical and surgical practice, changes in medical technology, and budgetary constraints. *

Box 5.1: Hospital Utilisation and Costs Study

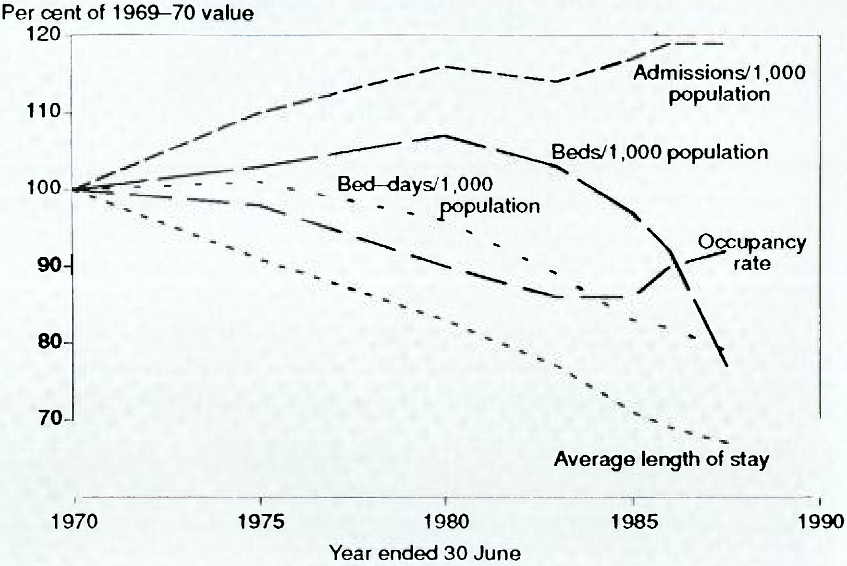
In 1986 the Australian Institute of Health undertook its first Hospital Utilisation and Costs Study at the request of the Australian Health Ministers' Advisory Council. The study provided information on the use and costs of hospitals and related institutions within Australia in 1985-86. Data from the study were presented in a four volume report and in *Australia's Health* (AIH 1988a). During 1989 the AIH undertook a second HUCS survey for the fiscal year 1987-88 and data from this study have been incorporated into this report.

This reduction in length of stay has had an impact on hospital staffing requirements. Most patients require more intensive care early in their stay in hospital, and with shorter length of stay and increased numbers of patients treated, the workload of hospitals can increase. Such an increase may not be reflected in a change in the number of bed-days or the occupancy rate but may result in a need for additional and more highly qualified staff. A study by the AIH estimated that a reduction of one day in the length of stay for all patients with a length of stay of more than one day would lead to an overall reduction in required nursing hours of 9.4 per cent (Renwick et al 1989). However, the average level of nursing care provided to patients would rise. If additional patients were admitted so that the total number of occupied bed-days remained the same, the newly arrived patients would require more intensive nursing attention and the nursing hours required would increase by 6.4 per cent.

The overall occupancy rate in Australia is still relatively low by international standards, with acute public hospitals reporting an occupancy rate of 72 per cent and private hospitals a rate of 58 per cent in 1987-88. However, the overall figures conceal wide variationsbetween hospitals of different types and in different locations. In 1987-88 public teaching hospitals had an average occupancy rate of 82 per cent and seven of these (16 per cent) had an average rate of over 90 per cent (AIH unpublished). Some larger hospitals are running at, or near, capacity for significant periods, and this would certainly be the case in specific units or wards.

Public concern has been expressed over waiting lists and waiting times for elective surgery, especially in public hospitals in the Sydney and Melbourne metropolitan areas. The availability of beds varies considerably between regions, with country areas generally having relatively higher supplies than cities. However, the range and quality of specialised services available to country people is generally more limited. The proportion of acute hospital beds available within public hospitals also varies widely, with country hospitals providing a greater proportion of non-acute care than city hospitals. The availability of medical services varies between hospitals of the same type and from sector to sector. Some hospitals are unable to recruit or retain adequate numbers of medical and nursing staff and, in some States, some medical specialities practice predominantly through private hospitals.

Figure 5.2 Utilisation and bed supply, all acute hospitals, 1969–70 to 1987–88



Note: Beds and bed–days calculated at 30 June.

Source: Harvey and Mathers 1988
Australian Institute of Health unpublished

Box 5.2: Classification of hospital patients

The classification of hospital patients as either public or private is an important and long-standing feature of the Australian health care system. On admission to a public hospital, a patient can elect to be treated either as a hospital (public) patient by a hospital appointed doctor, or as a private patient by a private doctor. If a patient elects to be treated as a hospital patient, accommodation and treatment are provided at no cost to the patient. The cost of services to public patients is met fully under the Medicare program. Patients attending a private hospital or electing to be classed as private patients in a public hospital are charged for services, such as accommodation, as well as medical treatment by their own doctors. Medicare refunds 75 per cent of the Commonwealth Medicare Scheduled Fee for medical services in hospitals. Private health insurance can cover most or all of the hospital charges as well as the 25 per cent difference between the Medicare benefit and the scheduled fee for medical services. Private insurance of medical fees in excess of the Schedule fee is prohibited by legislation.

5.1.2 Hospital outpatient services

Between 1978–79 and 1985–86 outpatient treatments are estimated to have increased by almost 6.9 per cent a year, representing an average annual increase of 5.5 per cent a year in the number of outpatient services per person (AIH 1988a). This trend has continued with almost 44 million outpatient treatments, or 2,676 treatments per thousand population, in public acute hospitals (including Department of Veterans' Affairs hospitals) in 1987–88. This represents an annual increase of 7.7 per cent in overall numbers, or a 5.8 per cent annual increase in the rate per thousand since 1985–86 (AIH unpublished).

5.1.3 Future influences on the demand for hospital care

The Australian population, like that of most developed countries, will age substantially over the next few decades (Chapter 7), and there has been some concern among health planners about the effect of the increasing proportion of older people on the future demand for acute hospital services. However, although older people are using an increasing proportion of acute hospital resources, this is largely because of increased use of services per person among older people, rather than to population ageing. This increased utilisation is illustrated by the changes in Western Australia between 1979 and 1985 (Figure 5.3).

In contrast, the Western Australian figures show reduced usage by the young. The reason is not clear, but one possibility is that there has been a shift in provision of services from an inpatient setting to other settings. It may also reflect improved health status of younger age groups compared with earlier cohorts. If this is the case there would be significant implications for future demand for health services.

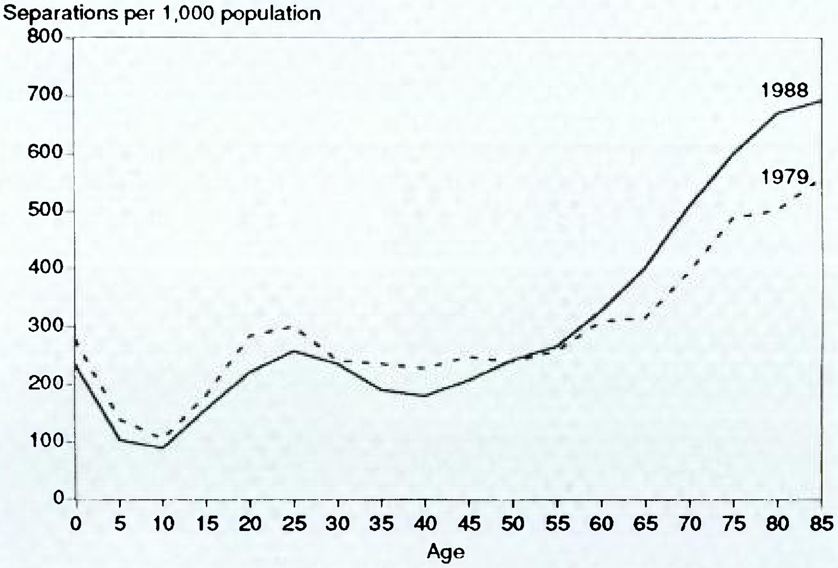
AIDS will also have an impact on acute hospital usage, depending on the rate at which the disease spreads throughout the community (Section 3.4).

Currently, the additional hospital resources required for treating AIDS cases are relatively small compared with the total requirements for acute care. Projections by the National Centre in HIV Epidemiology and Clinical Research suggest that the number of people living with AIDS will increase from an estimated 700 at 30 June 1989 to 1,350 at 30 June 1993.

The number of people with HIV related illnesses other than AIDS is expected to rise from 2,100 to 2,300 over the same period. This increase of 850 people with either AIDS or HIV related illness will have a limited impact on acute hospitals overall, although its impact on the hospitals where such patients are concentrated could be significant.

It has been estimated that the costs associated with treating AIDS cases in hospitals will increase from $13 million in 1988–89 to $30 million in 1992–93, and that the cost of AZT treatment and community care will be $60 million in 1988–89 and $86 million in 1992–93 (National Centre in HIV Epidemiology and Clinical Research unpublished). The additional hospital costs will represent only a small percentage increase on the $7.2 billion total operating costs of public acute hospitals for 1987–88.

Figure 5.3 Acute hospital separations by age, Western Australia, 1979 and 1988



Source: Gillett and Harvey 1989
Health Department of Western Australia unpublished

5.1.4 Use of long stay institutions

Psychiatric hospitals

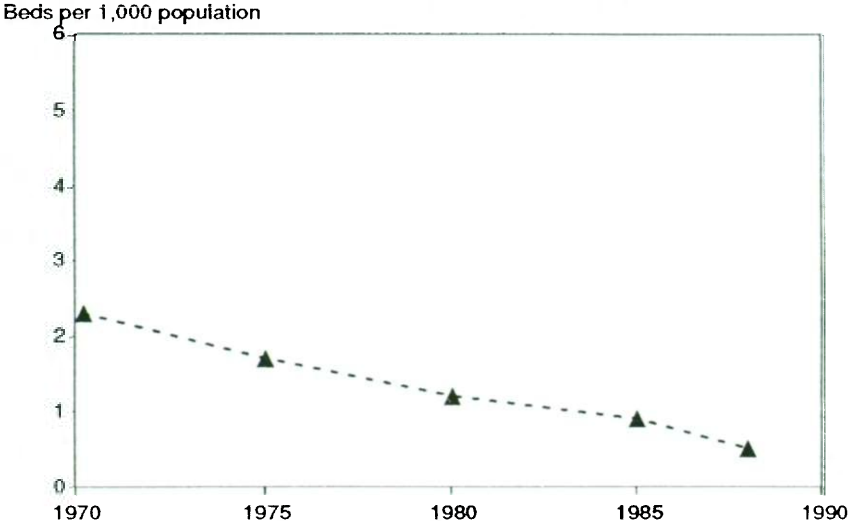
The number of beds in public psychiatric hospitals per thousand population has been falling steadily since 1970 (Figure 5.4). The number of beds fell from 12,741 in 1985–86 to 8,620 in 1987–88. The number of beds in private psychiatric hospitals also fell during this period, from 1,675 to 1,543.

Use of public psychiatric hospitals has also fallen. In 1985–86 there were just under 4 million occupied bed–days in public psychiatric hospitals—an occupancy rate of 86 per cent (Mathers and Harvey 1988).

Occupied bed–days fell to just under 2.5 million in 1987–88, giving an occupancy rate of 78 per cent. This reduction is a result of policies to manage psychiatric patients in community settings where possible. However, some of these patients are now treated in acute hospitals; the extent of the transfer of psychiatric patients from psychiatric to acute hospitals will be clarified when State and Territory hospital morbidity data for 1987–88 become available.

Treating psychiatric patients in the community appears to have had an impact on other parts of the health care system. An indication of the effect of deinstitutionalisation on private medical practice, including private patients in public and private hospitals, may be obtained from Medicare data for specific psychiatric services which shows an increase between 1985–86 and 1987–88 substantially above that of population growth.

Figure 5.4 Public psychiatric beds, 1970 to 1988



Source: Australian Institute of Health unpublished

Nursing homes

At 30 June 1988 there were 1,429 nursing homes for older people in Australia, providing 72,532 beds for frail aged people requiring ongoing nursing care (Box 5.3). This level of bed supply equates to 61 nursing home beds and 37 hostel beds per thousand people aged 70 years and over. However, the actual level of current provision varies considerably between States and Territories (AIH unpublished).

The Commonwealth Government is committed to a long term objective of 40 nursing home beds and 60 hostel beds per thousand people aged 70 years and over. This objective involves a significant decrease in utilisation rates of nursing homes and an equivalent increase in hostel utilisation rates.

Nursing home bed-day use by those aged 70 years and over increased from 21,207 per thousand in 1969–70 to 23,565 per thousand in 1984–85. The supply of nursing home beds for aged people increased from 63.4 per thousand people aged 70 years and over in 1969–70 to 71.7 per thousand in 1984–85 (Mathers and Harvey 1988). Since then a reduction in nursing home capacity consistent with Commonwealth policy has occurred. In 1987–88 there were 62.1 nursing home beds per thousand people aged 70 years and over providing about 22,131 occupied bed-days per thousand people aged 70 years and over (AIH unpublished).

In 1988 the Commonwealth introduced a new formula for subsidising care for individuals in non-government nursing homes. The previous classification system of extensive or ordinary care and the payments for providing that care did not adequately reflect levels of care required by different nursing home residents.

Box 5.3: Nursing homes

Nursing homes provide long term care involving regular basic nursing care for chronically ill, frail, disabled or convalescent or senile inpatients. They are categorised by Commonwealth Department of Community Services and Health as either nursing homes for the aged or nursing homes for young disabled people and within those classifications as either private–charitable, private–for profit, or State Government nursing homes.

The incentive for nursing home proprietors was to prefer patients with the lowest possible levels of disability. To overcome this, a five–level classification system of dependency based on capacity to undertake activities of daily living has been introduced, with levels of benefit commensurate with the costs of providing suitable care to patients in each category. This system is expected to facilitate the trend to greater use of hostels, as opposed to nursing home care.

5.1.5 Trends in acute hospital costs

For all types of institutional care, the average expenditure per bed and per bed–day has continued to increase in real terms since 1974–75 (Table 5.2). Although total operating costs for public acute hospitals (including repatriation hospitals) increased by 10.7 per cent between 1985–86 and 1987–88, the more intensive use of hospital facilities (for example, increased occupancy and reduced length of stay) resulted in a 4.3 per cent increase in the cost per occupied bed–day and an increase of only 1 per cent in the cost per patient (Table 5.3).

Table 5.2: Health expenditure(a) for institutional care, selected years, 1974–75 to 1987–88

	1974–75	*1979–80*	*1984–85*	*1987–88*
Average expenditure per bed		*($'000)*		
Acute care hospitals				
Public(b)	63.5	78.4	91.6	113.3
Private(c)	32.7	38.5	51.2	57.0
Public psychiatric	31.7	44.5	54.2	55.6
Nursing homes	17.3	18.9	21.7	na
Average expenditure per occupied bed–day		*($)*		
Acute care hospitals				
Public(b)	237	315	382	428
Private(c)	128	179	249	268
Public psychiatric	90	137	173	194
Nursing homes	51	55	70	na

(a) Based on average 1987–88 dollars.

(b) Includes repatriation hospitals.

(c) Includes private psychiatric hospitals.

Source: Australian Institute of Health unpublished

Table 5.3: Public hospital costs(a) 1985–86 and 1987–88

	1985–86	*1987–88*	*Change*
			(Per cent)
Total operating costs ($m)	6,330	7,009	10.7
Cost per patient ($)	1,836	1,891	1.0
Cost per occupied bed–day ($)	282	294	4.3

(a) Based on average 1987–88 dollars.

Note: Adjusted for outpatient and casualty activity by using the Health and Allied Services Advisory Committee (HASAC) inpatient/outpatient cost equivalent *(Hospital Utilisation And Costs Study* Vol 2:174).

Source: Mathers and Harvey 1988
Australian Institute of Health unpublished

5.2 Medical services

Medical services in Australia are provided in both institutional and community settings—mainly in acute hospitals and at private medical practices. It is not possible to provide an overview of the use of all medical services for three reasons:

- the description and classification of medical services provided in hospitals, especially for hospital patients in public hospitals, differs from those used for services in private medical practices;
- not all information is recorded in accessible information systems; and
- the extent of the data recorded has varied over time as the methods of paying for medical services have changed.

To provide some insights into trends in private medical service use, the AIH (Barer et al 1990a) analysed all insured medical services for six–month periods in 1975–76 and 1985–86. These were periods of universal insurance of private medical services for which complete information was collected (Box 5.4).

5.2.1 National and State changes, 1976 to 1986

The number of private medical services recorded per person increased in the two six–month periods from 2.8 in 1976 to 4.0 in 1986, an increase of 42 per cent over the decade or a compound rate of increase of 3.5 per cent a year. The cost of services per person adjusted for increases in schedule fees (the 'fee–adjusted cost') grew at a slightly higher rate of 3.9 per cent a year.

Changes in the age and sex composition of the population accounted for a 0.35 per cent increase in the annual per person recorded use of services. This was a small part of the total 3.54 per cent annual per person increase in the use of services. Almost the whole of the increase represented growth in age–specific and sex–specific rates of use, which were most rapid for the very young (under four years), the very old and, for some services, women of child–bearing age.

Levels of use and rates of growth in use of services showed considerable variation between States and Territories (Figure 5.5). New South Wales had the largest use of services per person in both 1976 and 1986. Except for the Northern Territory, which experienced a large increase in the availability of private medical services, the largest percentage increases (about 4.5 per cent a year) were in Tasmania and Queensland. South Australia, with the second-highest use of services per person in 1976, recorded the lowest rate of increase.

While there is a high correlation between the number of private medical services per person in a State and the number of private medical practitioners per person in that State, the effect is not clear (Figure 5.6). There has been considerable unresolved debate over whether doctor supply responds to demand for services or whether doctor supply induces services (Richardson 1987).

Box 5.4: Method of analysis and data considerations

The medical service data analysed by Barer et al (1990a) were summary data provided by the Commonwealth Department of Community Services and Health from 10 per cent samples of Medibank and Medicare data originally collected by the Health Insurance Commission.

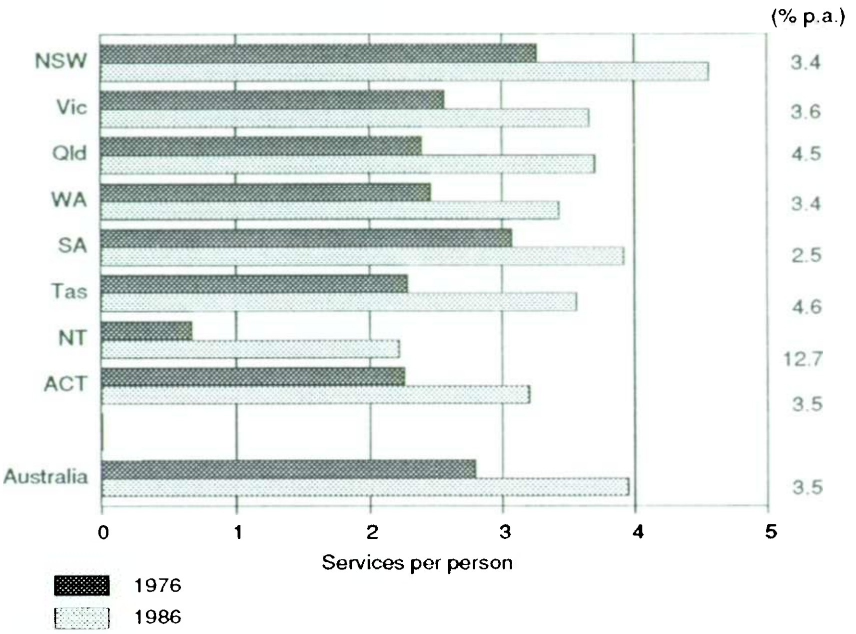
In the interests of conciseness and simplicity, most of the results presented here are confined to the use of services rather than the costs, although the Barer report also analysed changes in the cost of services adjusted for inflation by adjusting the 1986 costs for increases in the fees given in the Medicare Benefits Schedule.

The main problem with using these data sets to compare the use of medical services at different times is the lack of detailed information about the effects of changes in the provision of medical services in public hospitals. Private medical services could have increased for a number of reasons, the most evident being an increase in the proportion of patients treated as private patients in public hospitals.

The Medicare Benefits Schedule classifies services into broad groups of items known as 'parts' of the schedule. The AIH's analysis used these 'parts' with some modifications: for instance, services classified under 'operations' and 'assistance at operations' have been combined here into a single item group called 'operations'. The term 'item group' denotes these modified 'parts'.

The Medibank and Medicare data available to the AIH contained no direct information on the characteristics of non-users of services and no diagnostic information was collected on patients.

Figure 5.5: Private medical services per person by State and Territory, 1976 and 1986(a)



(a) Six months, April to September, 1976 and 1986.

Source: Barer et al 1990a

Figure 5.6: Relationship of services per person to number of doctors in private practice per 10,000 population

Note:
N New South Wales & ACT
V Victoria
Q Queensland
W Western Australia
S South Australia & Northern Territory
T Tasmania

Source: Barer et al 1990a

5.2.2 Changes by item group, age group and sex

The largest increase in the number of services recorded per person in absolute terms occurred in pathology (Figure 5.7). The size of the increase reflects the change in the use of private services, some of which will be a redistribution from the public sector (Box 5.5).

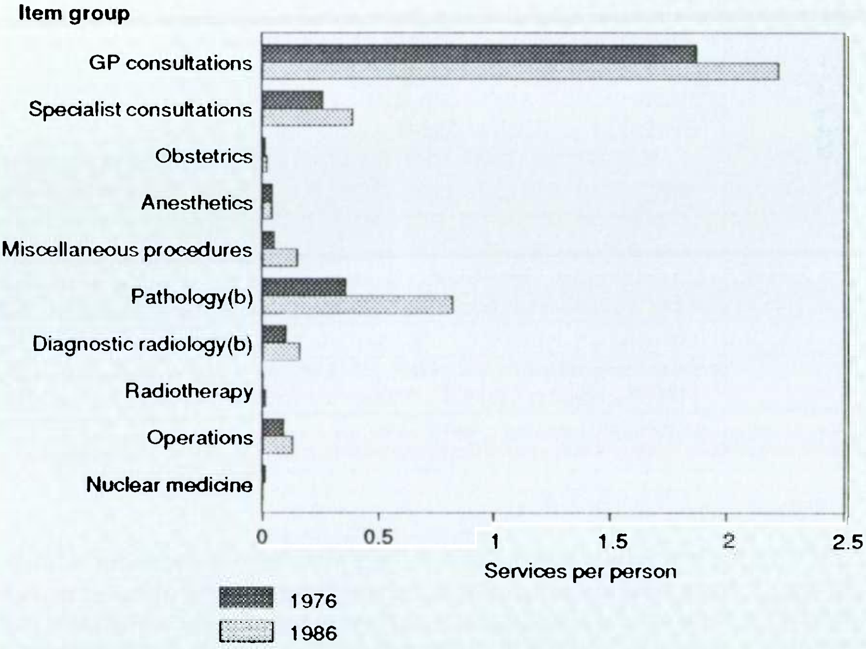
The next largest absolute increase was in GP consultations, which was the largest group of medical services. By comparison, radiotherapy, miscellaneous procedures, diagnostic radiology and specialist consultations each involved much smaller numbers of services, but their percentage increases were substantial.

For both males and females, services per person by age group (Figure 5.8) dipped between the ages of five and 15 years and then increased steadily with increasing age. For females, services increased during the main child-bearing years of 15 to 35.

The greatest percentage increases over the decade were in the 0–4 and 10–14 year age groups in both sexes, and for males aged 55–59 and 80–84 years (Figure 5.9).

When the variations in services by age group and sex were disaggregated by type of service, a striking observation is the 50 per cent increase in GP consultations to the very young (Figure 5.10). For both sexes, the increases were about 50 per cent in the 0–4 age group and about 40 per cent in the 10–14 age group.

Figure 5.7: Private medical services per person by item group, 1976 and 1986(a)



(a) Six months, April to September, 1976 and 1986.
(b) See Box 5.5.
Source: Barer et al 1990a

Box 5.5: Services insured by Medibank and Medicare

Medibank began in July 1975, but from October 1976 there was a series of changes which progressively reduced its coverage. Ultimately, Medibank provided cover only to selected social security beneficiaries (Sax 1984). As a result, the only period for which almost complete data were available to the Medibank system was from about April 1976, when most of the initial processing problems had been overcome, to the end of September in the same year, when the modifications began. For this reason, this six-month period was chosen as the baseline period of the study (Box 5.4).

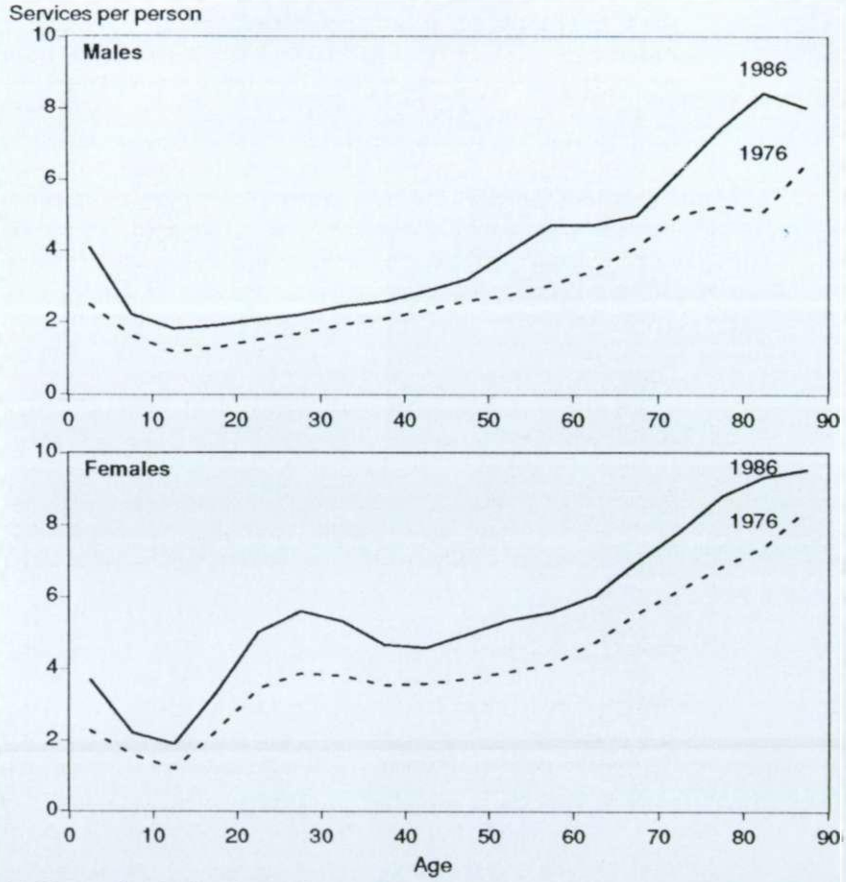
Medicare, which closely resembles the original Medibank program, has operated as a universal national health insurance scheme since February 1984.

The services recorded under Medibank and Medicare encompass all medical services for which claims were paid by the Health Insurance Commission. They include all medical services billed by GPs and specialists as private practitioners in surgeries, nursing homes, laboratories and on home visits and services to private patients in public and private hospitals. They exclude services which did not attract Medibank/Medicare benefits, such as those provided free by salaried and sessional doctors in public hospitals and community health centres, services to veterans (treated under the Department of Veteran Affairs health program) and services provided by charitable organisations. Services covered by compensation and screening services are also excluded. The exclusions and non-billed services under Medibank are discussed in more detail by Richardson and Deeble (1982).

It is important to note that diagnostic services (pathology and radiology) provided by public hospitals for private patients in 1976 were not included in the Medibank data as no payment was made. Diagnostic services were included under the 1986 Medicare scheme, and a benefit paid. No adjustments for the change have been made, which may result in some overstatement of the increase in the series. An estimate of the effect is provided by Harvey and Richardson (1983). Other changes, such as benefit schedule restructuring, may have acted in a countervailing manner.

GP consultations were the only broad category of service for which there were reductions in use by older people (except for men aged 75–84). The reduction in the use of GP consultations may have been because, before Medibank, eligible aged pensioners received GP consultations free through the Pensioner Medical Service. Specialist services were provided through hospital outpatient departments. Over the decade private specialist care may have substituted, in part, for both outpatient services and for some GP services.

Figure 5.8: Private medical services per person, 1976 and 1986(a)



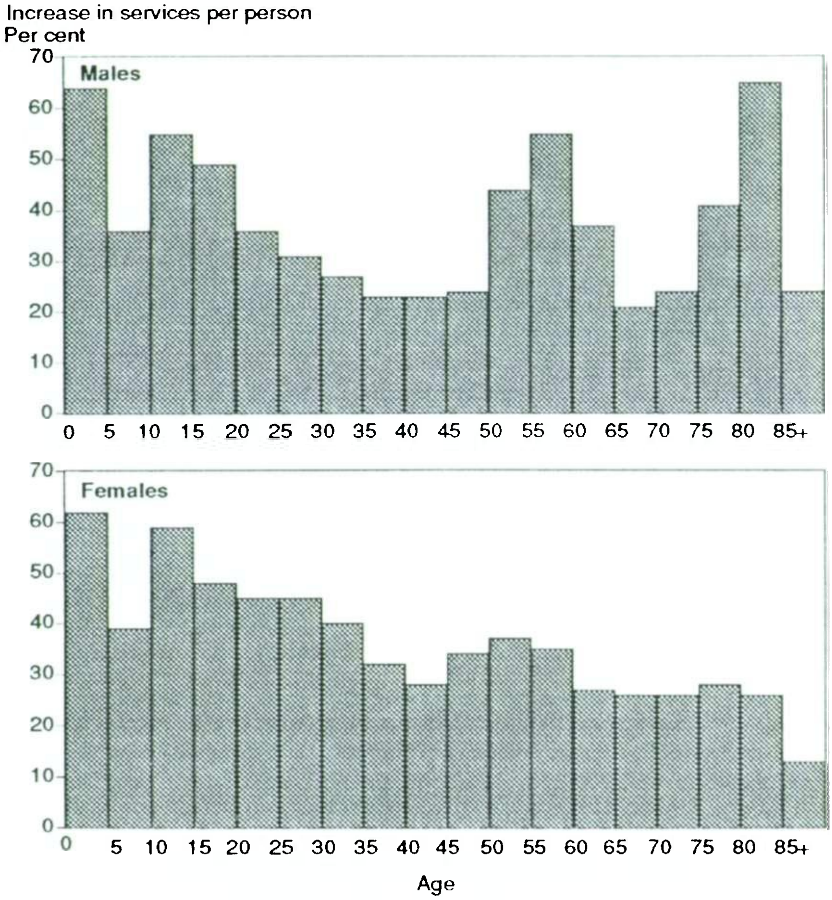
(a) Six months, April to September, 1976 and 1986.

Source: Barer et al 1990a

In all the other item groups, which were mostly specialist procedures, there were large increases in services to the older people of both sexes.

In pathology, the dramatic shift in the age-related pattern of use is most clearly portrayed by the percentage change in the number of services, which showed very large growth in the diagnostic laboratory services delivered to the very young and the very old (Figure 5.11). In 1976, the 0–4 age group was second only to the 10–14 group as the lowest pathology user in per capita terms of all the five-year age groups (Figure 5.12). But, by 1986, per capita services for those under 5 years were almost double those for the 10–14 group. Use by that latter group had itself more than doubled over the 10 years (Figure 5.11). Among the very old, those over 75 years of age were the highest users of pathology services in 1986 (Figure 5.12). Rates of growth in use among these very old were exceeded only by those for the very young. Those 85 and older in 1986 received, on average, almost four

Figure 5.9: Increase in private medical services per person, 1976 to 1986(a)



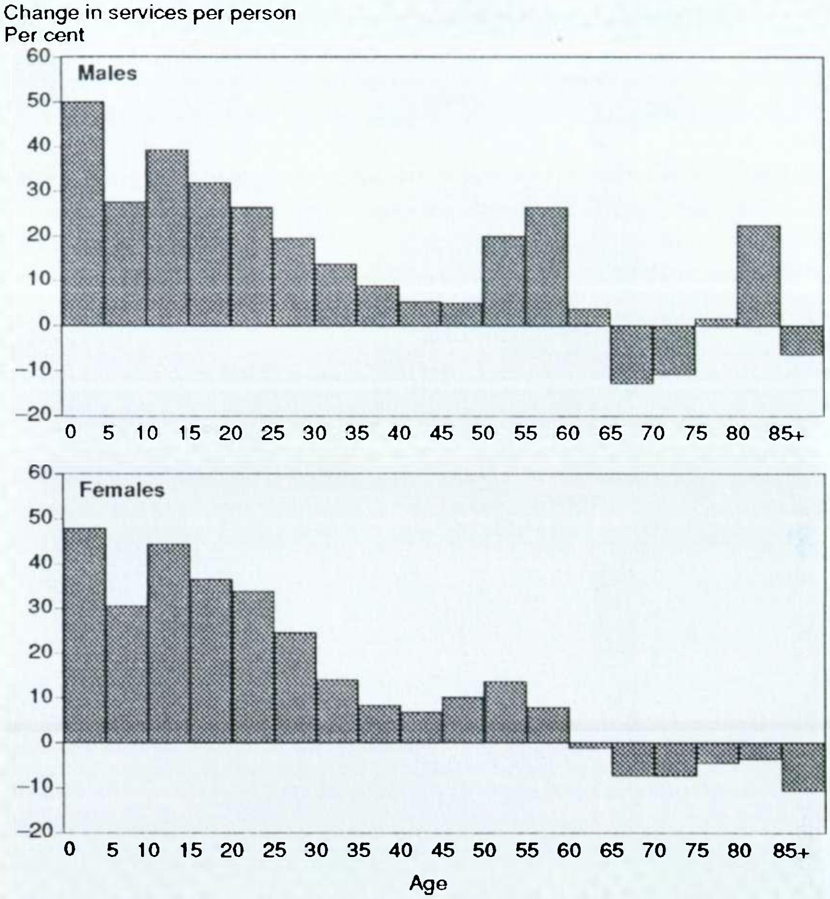
(a) Six months, April to September, 1976 and 1986.

Source: Barer et al 1990a

times the number of tests per capita, as their 1976 counterparts. It should be mentioned that, both in 1976 and 1986, women of child-bearing age were the largest users of pathology (Figure 5.12), but the percentage increase in their use was moderate.

There was a major restructuring of pathology items in the Medical Benefits Schedule in 1977. Although the change was designed neither to increase nor to decrease overall pathology fees, there was a large reduction in the actual number of claimable items. For example, if four tests of a specified type were performed and claimed for previously, now it might be possible to claim only one higher priced item for the same set of tests. This would mean that the increase in number of pathology services per person between 1976 and 1986 tends to underestimate the increase in the use of pathology services. In this case a better indicator is the 'fee-adjusted cost' (Barer et al 1990a).

Figure 5.10: Change in private general practitioner consultation services per person, 1976 to 1986(a)



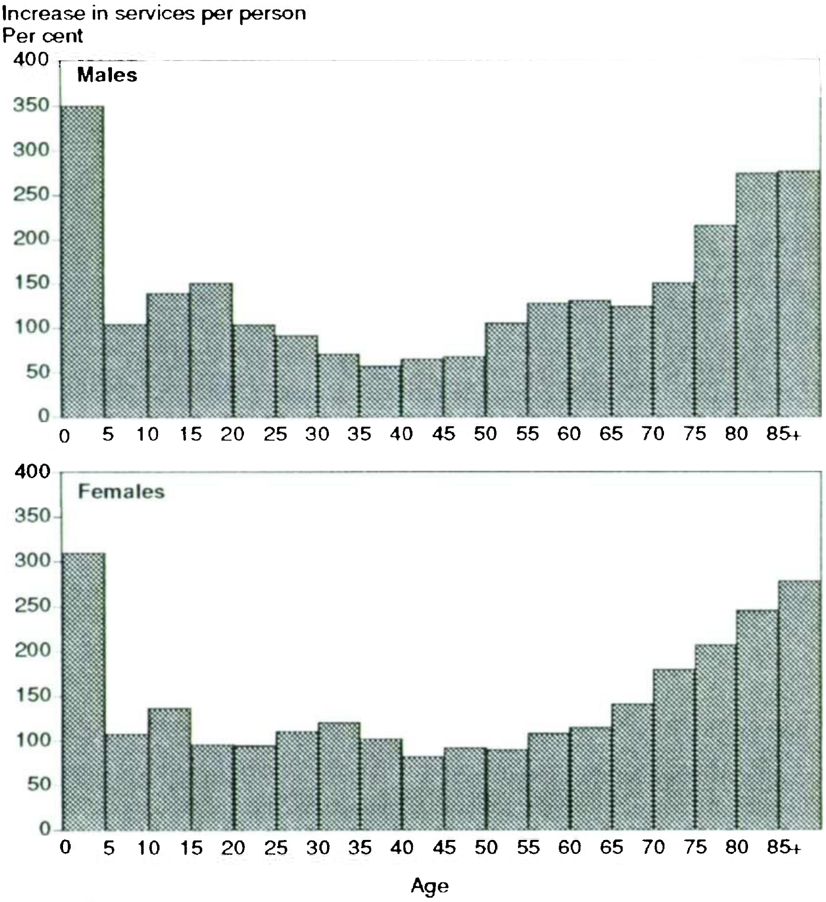
(a) Six months, April to September, 1976 and 1986.

Source: Barer et al 1990a

The restructuring of hospital based pathology services for private patients under Medibank and Medicare should also be borne in mind (Box 5.5). Even if an adjustment is made for the changes, pathology services were still the fastest growing part of the Medical Benefits Schedule (Barer et al 1990b).

Detailed analysis of increased use of individual items of service is still to be undertaken. There has been an initial study of the growth in miscellaneous procedures, covering a variety of non-surgical diagnostic and therapeutic procedures other than radiology or pathology (Figure 5.13). The growth rate for females was almost 16 per cent a year, compared with about 10 per cent for males. In this category, the leading service was ultrasound, which increased from 6,660 services in the six-month period studied in 1976 to 370,090 for the same period in 1986. While substitution for hazardous prenatal

Figure 5.11: Increase in private pathology services(a) per person, 1976 to 1986(b)

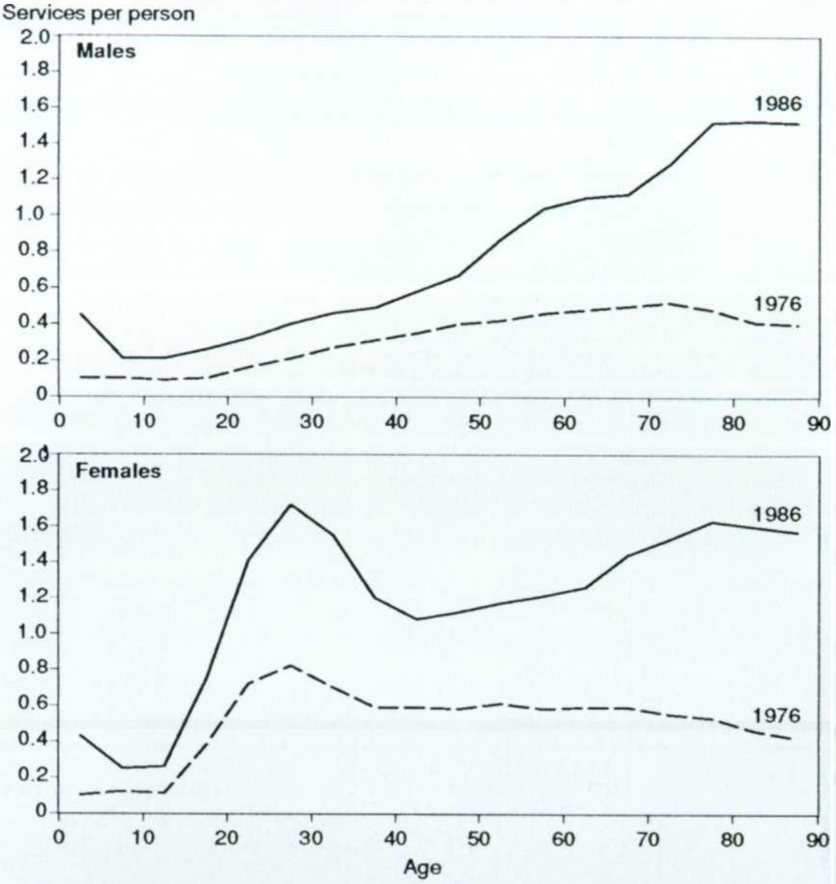


(a) See Box 5.5.
(b) Six months, April to September, 1976 and 1986.

Source: Barer et al 1990a

x-rays can explain much of the rapid growth of ultrasound among females aged 15–39, it cannot account for the high growth in other age groups. Increases among people of both sexes aged 75 years or more were all in excess of 270 per cent over the decade. However, the marked growth was from a low base as ultrasound technology had been newly introduced to clinical practice in the 1970s. That ultrasound is not just a substitute for x-rays, as they were formerly used, is demonstrated by the large increases in diagnostic radiology services among both sexes, especially in the very young and very old (Figure 5.14).

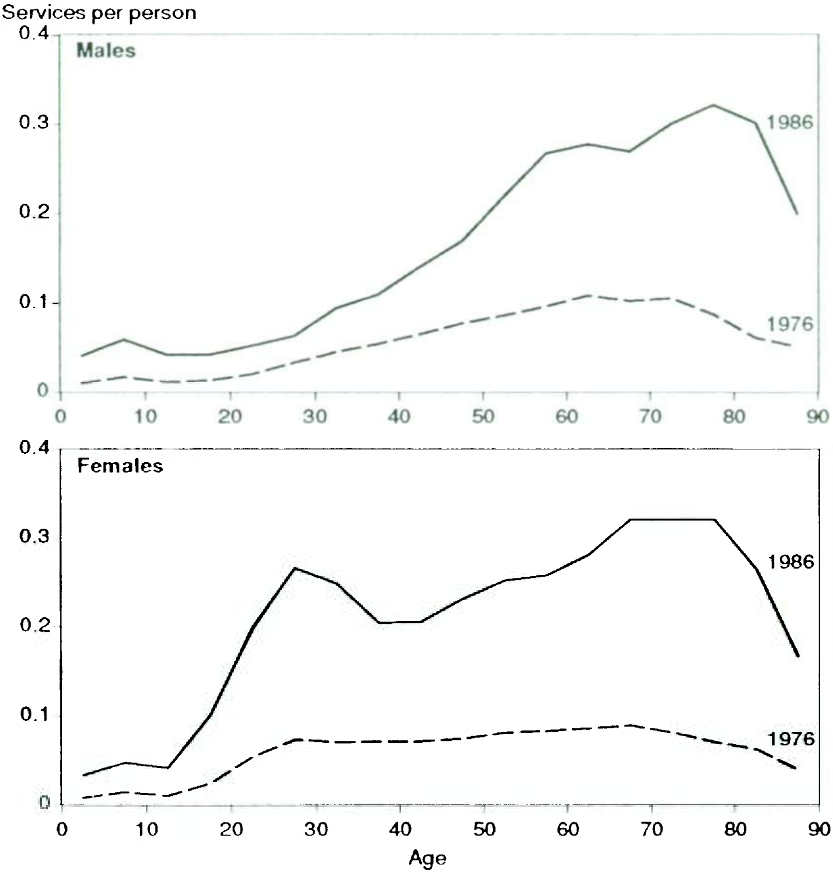
Figure 5.12: Private pathology services(a) per person, 1976 and 1986(b)



(a) See Box 5.5.
(b) Six months, April to September, 1976 and 1986.

Source: Barer et al 1990a

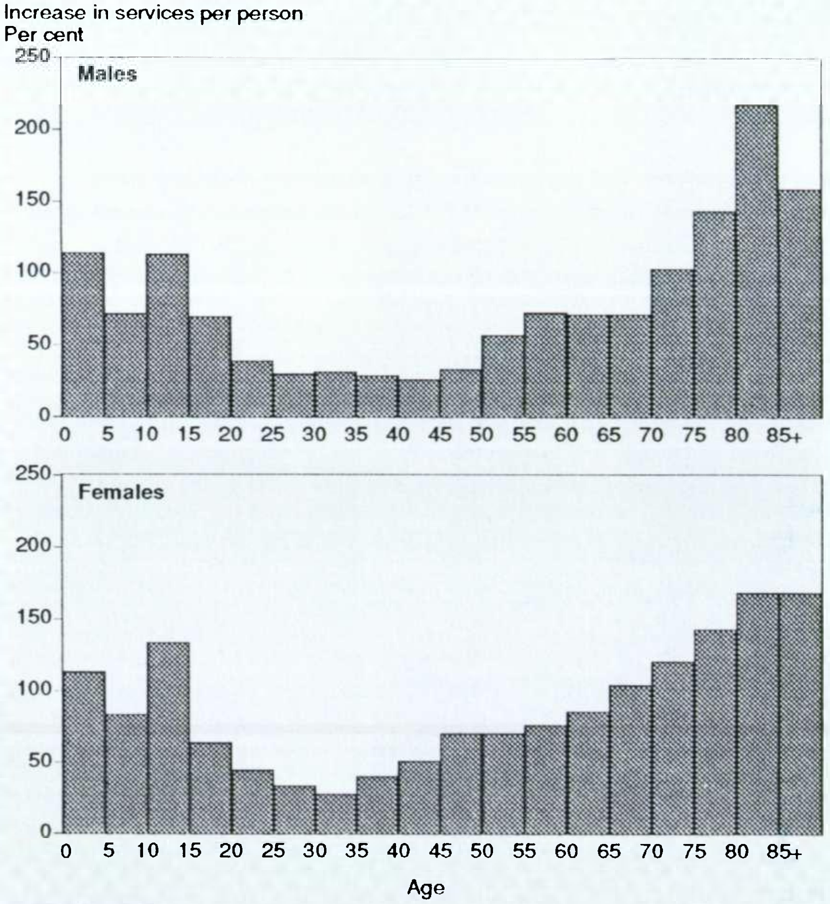
Figure 5.13: Private miscellaneous procedures per person, 1976 and 1986(a)



(a) Six months, April to September, 1976 and 1986.

Source: Barer et al 1990a

Figure 5.14: Increase in private diagnostic radiology services(a) per person, 1976 to 1986(b)



(a) See Box 5.5.
(b) Six months, April to September, 1976 and 1986.

Note: Data plotted in 5 year age groups 0–4 years, 5–9 years, etc.

Source: Barer et al 1990a

5.2.3 Recent trends: 1985–86 to 1988–89

To obtain some information on recent trends in the use of Medicare services, statistics published in the annual reports of the Health Insurance Commission are used.

These recent HIC data are not strictly comparable with those presented from Barer's 1976–1986 study. The recent data were collected for whole financial years rather than for six-month periods, they correspond to services per enrolled person rather than services per resident person, and they have been aggregated by date of processing rather than by date of service.

Table 5.4: Private medical services per person, by age and sex, 1985–86 to 1988–89 and annual increase from 1976–1986 and 1985–1989

	Services per person				*Annual increase*	
Age group	*1985–86*	*1986–87*	*1987–88*	*1988–89*	*(a)1976–86*	*1985–89*
	(Number)	*(Number)*	*(Number)*	*(Number)*	*(Per cent)*	*(Per cent)*
Males						
0–4	7.7	8.0	8.4	8.9	5.1	5.0
5–9	4.3	4.4	4.7	5.0	3.1	4.9
10–14	3.7	3.8	4.0	4.2	4.5	4.5
15–19	3.6	3.7	4.0	4.2	4.0	5.5
20–24	4.1	4.2	4.3	4.4	3.2	2.8
25–34	4.4	4.5	4.7	4.9	2.6	3.3
35–44	5.1	5.3	5.5	5.8	2.1	4.0
45–54	7.0	7.2	7.4	7.5	2.9	2.5
55–64	9.0	9.7	10.1	10.6	3.9	5.7
65–74	10.6	11.0	10.0	11.1	2.1	1.9
75+	13.8	14.4	14.4	14.4	3.8	1.5
All males	5.9	6.2	6.4	6.7	3.5	4.0
Females						
0–4	6.9	7.3	7.6	8.1	5.0	5.3
5–9	4.2	4.4	4.7	4.9	3.3	5.1
10–14	3.8	3.9	4.1	4.4	4.8	4.7
15–19	6.3	6.6	6.9	7.4	4.0	5.0
20–24	9.6	9.8	9.8	10.2	3.8	1.9
25–34	10.4	10.7	10.9	11.3	3.6	3.0
35–44	8.9	9.2	9.6	10.1	2.7	4.2
45–54	10.1	10.5	10.9	11.3	3.0	3.9
55–64	11.5	12.1	12.6	13.1	2.8	4.3
65–74	14.0	14.7	15.0	15.5	2.4	3.4
75+	16.3	17.0	17.0	17.0	2.2	1.5
All females	9.2	9.6	9.9	10.4	3.6	3.9
All persons	7.6	7.9	8.2	8.5	3.5	4.0

(a) Derived from a 10 per cent sample based on date of service for the two six-month periods, April to September, 1976 and 1986 (Barer et al 1990a).

Note: Health Insurance Commission Annual Reports use date of processing data. The Australian Institute of Health has adjusted the Health Insurance figures for differences between Health Insurance Commission enrolled persons and ABS resident population numbers.

Source: Health Insurance Commission 1986 to 1989
Barer et al (1990a)

Since these differences preclude a precise numerical comparison of the 1976 to 1986 trend with the 1985–86 to 1988–89 trend, the following summary is limited to some broad features of the data. A more detailed analysis is in progress at the AIH.

In the recent data, the annual increase in services over the three-year period was 3.5 per cent per enrolled person and 4.0 per cent per resident person. This suggests the annual increase in services is now a little higher than the 3.5 per cent recorded between 1976 and 1986.

Disaggregation of the increase from 1985–86 to 1988–89 into parts of the Schedule is complicated because several items were shifted between different parts of the Schedule. But there does appear to have been a real increase in GP consultations. Between 1976 and 1986, the annual increase in the number of GP consultations per person was 1.7 per cent, but between 1985–86 and 1988–89 it was 3.7 per cent.

A preliminary disaggregation by age and sex of the increase in number of services per person shows similar broad characteristics to those of the 1976–1986 study, but there are some differences in detail (Table 5.4). For males, the largest percentage increases were, in order, in the 55–64, 15–19 and 0–4 age groups), whereas between 1976 and 1986 they were in the 80–84, 0–4, 55–59 and 10–14 age groups. (The 80–84 age group does not exist in the current HIC data which have only the 75 and over age group for the oldest aged.) For females, the largest percentage increase was still in the 0–4 age group while the next highest rates of increase were in the 5–9 age group, then the 10–14 age group. The rates of increase in the use of services by females of different ages was more variable than for males.

5.3 Pharmaceutical drugs

Information about almost all aspects of pharmaceutical drug use in Australia is very poor. Good quality data do not exist for aggregated use of drugs (such as total expenditure by hospitals or individuals on prescription drugs), or for disaggregated use (such as the patterns of drug use by individuals).

The Commonwealth Government provides a wide range of pharmaceutical drugs free, or at subsidised prices, through the Pharmaceutical Benefits Scheme (PBS) and through direct grants for specific purposes (Box 5.6). Prescription drugs constitute the greatest proportion, by number and by cost, of drugs provided through the PBS, although a significant proportion of drugs available for Pensioner Beneficiaries are over–the–counter (OTC) drugs. Drugs supplied through hospital pharmacies are also a mixture of prescription and OTC, but mainly prescription. The OTC products are the only major class of drug for which a prescription is not required and for which a significant proportion of sales are made through retail outlets other than community pharmacies.

The Australian Pharmaceutical Manufacturers' Association estimated the total value in 1988 of sales of drugs at manufacturers' prices at $1.5 billion, of which $420 million was for OTC drugs. From its 1987–88 hospital utilisation and cost study (unpublished), the AIH estimated sales at manufacturers' prices to hospitals at about $220 million. Sales at manufacturers' prices of prescription drugs were estimated at about $1.1 billion, of which about 12 per cent were for private prescriptions with the remainder available under the PBS and Repatriation Pharmaceutical Benefits Scheme (Figure 5.15).

Box 5.6: Pharmaceutical Benefits Scheme(a)

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

There are three main classes of beneficiaries under the PBS:

- Pensioner Beneficiaries receive scheduled drugs free. This group includes:
  - those in receipt of a full age pension;
  - supporting parents holding Pensioner Health Benefits cards, invalid pensioners holding Health Benefits cards, war widows with Dependent Treatment Entitlement cards and veterans without recognised war caused disabilities holding Service Pensioner Benefits cards, and their dependents. (Veterans with recognised war caused disabilities receive special treatment under the Repatriation Pharmaceutical Benefits Scheme).

- Concessional Beneficiaries, who hold Pharmaceutical Benefits Concession cards (age pensioners excluded from full pension benefits) or Health Care cards (unemployed and low income earners) are required to contribute $2.50 towards the cost of each item.

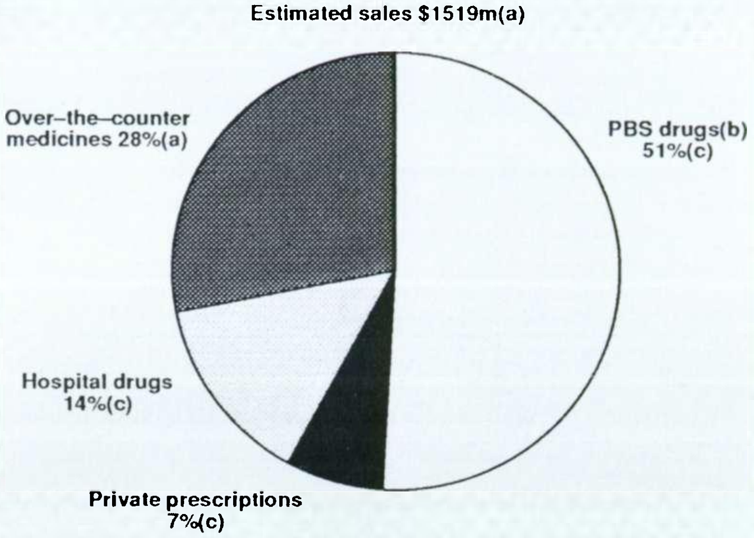
  People deemed eligible to receive unemployment benefits are automatically issued with a Health Care Card. There is no means testing on unemployed benefits or on the concessional benefits flowing from that benefit.

  People receiving sickness benefits are eligible for either a Health Benefits card or a Health Care card, depending on individual circumstances assessed by the Commonwealth Department of Social Security.

- General Beneficiaries pay $11.00 per benefit item. Under the Safety Net Scheme, any family or individual receiving 25 PBS prescriptions in a calendar year is entitled to be issued with an Entitlement Card providing free benefits for the remainder of that calendar year.

(a) As at 30 June 1990

Figure 5.15: Estimated sales of pharmaceutical drugs for human use, ex-manufacturers' prices, 1988



(a) Australian Pharmaceutical Manufacturers Association figure.
(b) Includes Repatriation Pharmaceutical Benefits Scheme products.
(c) AIH estimate

Source: Australian Pharmaceutical Manufacturers Association (unpublished)

5.3.1 Role of the Commonwealth

The Commonwealth Government plays a major role in regulating the pharmaceutical drugs industry through the Pharmaceutical Benefits Scheme. In cooperation with the States and Territories, the Commonwealth regulates manufacture of drugs in Australia, and importation of drugs. All imported drugs must be certified by the Australian Drug Evaluation Committee to be safe and efficacious.

The prices of a significant proportion of pharmaceutical drugs sold under the PBS are determined by the Commonwealth Government. PBS products represented an estimated 51 per cent of the expenditure on drugs in Australia in 1988 (Figure 5.15). The Health Insurance Commission (HIC) is responsible for payments to pharmacists dispensing PBS drugs.

To promote research on pharmaceutical drugs, the Commonwealth Government pays companies undertaking research in Australia higher prices for drugs sold through the PBS. This premium is referred to as Factor 'F'.

The main items of expenditure by the Commonwealth on pharmaceutical drugs in 1988–89 are shown in Table 5.5.

Table 5.5: Commonwealth expenditure on pharmaceuticals 1988–89

($ million)

	Expenditure
Pharmaceutical Benefits Scheme	
General benefits	132.0
Concessional benefits	63.3
Pensioner benefit	656.3
Safety Net	138.7
Miscellaneous services(a)	33.2
Total	1,023.5
Repatriation Pharmaceutical Benefits Scheme	80.8
Factor 'F' payments	1.3
Commonwealth DCSH administration costs	23.2
Total Commonwealth expenditure	**1,128.8**

(a) Includes payments for dialysis fluids, growth hormones and other special program items.

Source: Commonwealth Department of Community Services and Health 1989a
Australia. Parliament 1989

Trends in expenditure and on use of PBS drugs

Changes to the PBS over the past five years have made it difficult to interpret trends in expenditure and use of PBS drugs (Table 5.6).

The introduction of the Safety Net in November 1986 resulted in discontinuity in the series for both Concessional and General Beneficiaries (Section 5.3.2). A number of other factors also makes year to year comparisons difficult:

- The deletion of a number of minor drug groups from the schedule of drugs in November 1986, and the subsequent relisting in June 1987 of some analgesics delisted in November.
- In August 1988, 53 expensive drugs were added to the list of drugs which required Commonwealth Department of Community Services and Health authority for doctors to prescribe: some of these drugs were taken off this list soon after. Requiring an authority to prescribe a drug often reduces significantly the rate at which drugs are prescribed.
- At the same time the maximum quantity of some drugs that could be prescribed on one prescription was doubled—thereby reducing the number of prescriptions processed, but not reducing the amount of drugs prescribed.

The use of drugs by Pensioner Beneficiaries has been least disturbed by these changes. Over the four years 1984–85 to 1988–89, it showed an increase in Commonwealth Government expenditure of 84 per cent, from $356 million to $655 million. Over the same period the average prescription price for Pensioner prescriptions increased from $5.93 to $9.88—an increase of 67 per cent. Prescription use per person increased by 7 per cent, so the increase in price per prescription was the major cause of the increase in Commonwealth expenditure on PBS drugs for Pensioner Beneficiaries.

The increase in average cost per prescription was partly because of the delisting of cheaper items in 1986, but primarily because of the introduction of more expensive drugs that found wide acceptance within the medical profession. The rate of increase in Pensioner PBS

Table 5.6: Expenditure and use of Pharmaceutical Benefits Scheme drugs, 1984–85 to 1988–89

	Beneficiary type				
	Pensioner	*General*	*Concessional*	*Safety Net(a)*	*Totals*
1984–85					
Scripts ('000)	60,070	50,690	10,069	—	120,829
CW expenditure ($m)	356.2	142.4	43.3	—	541.9
Patient contribution ($m)	—	201.1	20.2	—	221.4
Total ($m)	356.2	343.6	63.5	—	763.3
1985–86					
Scripts('000)	63,192	46,334	10,316	—	119,842
CW expenditure ($m)	408.0	138.4	50.2	—	596.6
Patient contribution ($m)	—	222.3	20.7	—	243.0
Total ($m)	408.0	360.7	70.9	—	839.6
1986–87					
Scripts ('000)	62,906	28,763	9,756	1,337	102,762
CW expenditure ($m)	503.0	140.6	59.7	11.2	714.5
Patient contribution ($m)	—	167.1	22.0	—	189.2
Total ($m)	503.0	307.7	81.8	11.2	903.7
1987–88					
Scripts ('000)	65,981	12,339	7,521	15,060	100,901
CW expenditure ($m)	588.1	111.7	51.6	159.4	910.9
Patient contribution ($m)	—	117.9	18.8	—	136.8
Total ($m)	588.1	229.7	70.4	159.4	1,047.6
1988–89					
Scripts ('000)	66,354	14,079	8,223	11,930	100,586
CW expenditure ($m)	656.3	132.0	63.3	138.7	990.3
Patient contribution ($m)	—	147.7	20.6	—	168.3
Total ($m)	656.3	279.7	83.9	138.7	1,158.6

(a) Safety Net arrangements operated from 1 November 1986.

Source: Commonwealth Department of Community Services and Health 1985 to 1989a

prescription prices was highest between 1985–86 and 1986–87 when prices increased per prescription by almost 24 per cent. Prices increased by slightly less than 8 per cent from 1987–88 to 1988–89. Increases in the average prices of prescription drugs for Concessional Beneficiaries showed the same pattern, although the introduction of the Safety Net arrangement would have affected these averages. The Safety Net arrangements have had such a significant effect on both the prescription numbers and costs of PBS drugs provided to General Beneficiaries that little useful comment can be made about trends in use because of lack of appropriate detailed data.

There is little reliable information about the number or costs of prescriptions not covered by the PBS or the Repatriation Pharmaceutical Benefits Scheme. The Commonwealth Department of Community Services and Health and the Pharmacy Guild of Australia are jointly working to improve the availability of information.

5.3.2 The Safety Net

Safety Net arrangements have operated since 1 November 1986. There were two major effects of the Safety Net: the first was to redistribute Government subsidies away from people who used small numbers of PBS prescriptions to those who were high users; and the second was to reduce, or moderate, the rate of Government expenditure on the PBS.

Previously, General and Concessional Beneficiaries were eligible for PBS drugs for a patient contribution of $5 and $2.50 per prescription, respectively. After 1 November 1986, the patient contribution for General Beneficiaries was increased to $10, and subsequently to $11 in July 1988. The contribution remained at $2.50 for Concessional Beneficiaries. However for both sets of Beneficiaries, PBS drugs were provided free once the total number of prescriptions used by a family or an individual reached 25 in a calendar year (although the first 'year' ran from November 1986 to December 1987).

In the '14-month year' November 1986 to December 1987, 517,700 Pharmaceutical Benefits Entitlement cards were issued under the Safety Net. These cards entitled 1.25 million people to 15.1 million free PBS prescriptions. In 1988, 407,800 cards were issued entitling 1.07 million people to 12.1 million free prescriptions—fewer than in the previous year because of the shorter period, and possibly because of hoarding at the end the first Safety Net year.

For General Beneficiaries, the maximum patient contribution per prescription increased from $5 to $10 in 1986. As a result anyone using small numbers of prescriptions was up to $5 per prescription worse off than before the Safety Net arrangement. Once 25 prescriptions were reached, additional prescriptions were free.

As the contribution paid by Concessional Beneficiaries did not increase, no Concessional Beneficiary had to pay more, and any Concessional Beneficiary, or family with such an entitlement, who used 25 prescriptions was immediately better off.

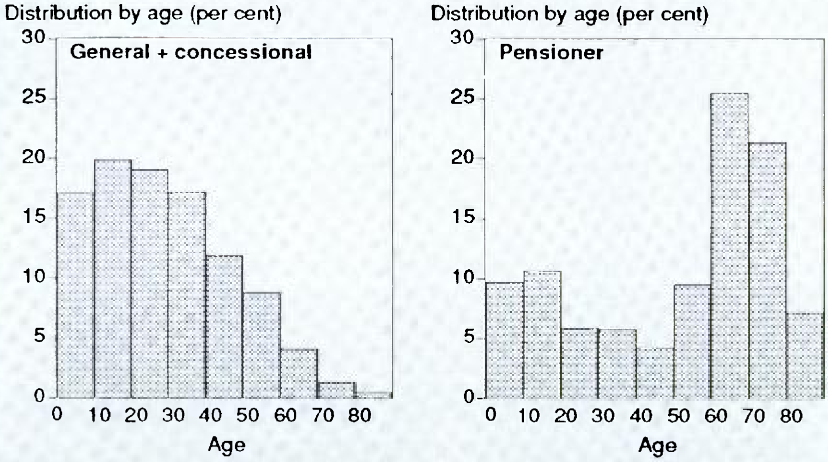
It is difficult to estimate savings to Commonwealth Government expenditure. In the year before the Safety Net began, the Commonwealth subsidised 46.3 million General Beneficiary scripts. In the first year of the Safety Net operation, it subsidised about 30.1 million scripts, and about 27.4 million in the second year. Prescription prices for Concessional Beneficiary drugs, which have been similar historically to General Beneficiary drugs, increased by about 22 per cent between 1985–86 and 1986–87. If the General Beneficiary patient contribution had not increased from $5 in 1986–87 the Commonwealth Government could have paid out $100 million more than it did after the introduction of the Safety Net. However, it is likely there would have been other changes if the Safety Net had not been introduced.

5.3.3 Use of drugs by individuals

Little information is available about the patterns of individual drug use. Most of the available data are derived from surveys or studies of the use of particular drugs.

The AIH studied the use of PBS drugs between April and June 1985 in two country areas with a combined population of about 66,000 people. The study, which was conducted before the Safety Net was

Figure 5.16: Pharmaceutical beneficiaries by age, June quarter 1985, study areas



Source: Australian Institute of Health unpublished

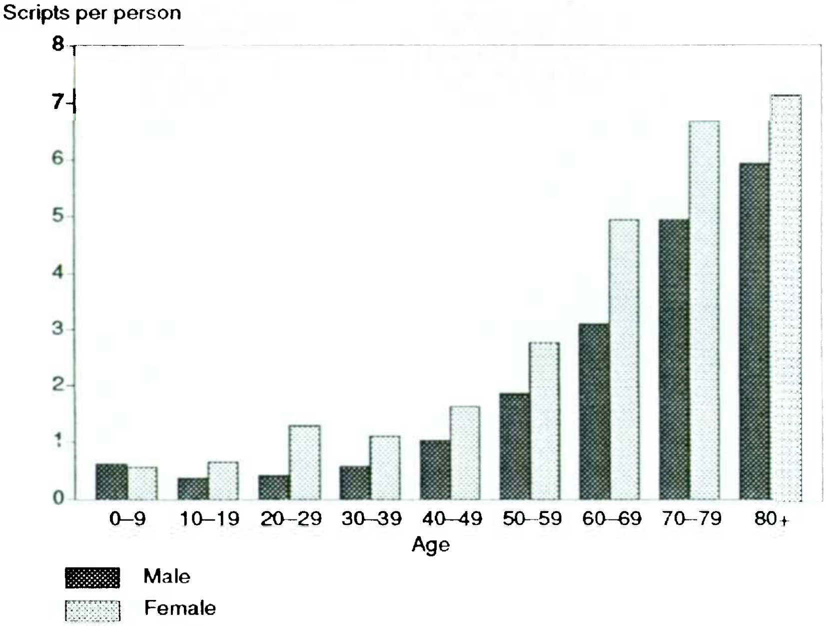
introduced, examined about 100,000 PBS prescriptions dispensed b pharmacists in the study areas. At the time, PBS drugs accounted for about 80 per cent of all prescriptions dispensed by community pharmacists. It is likely that about 10 per cent of prescriptions for people living in the study area were dispensed by pharmacists outside the study area and therefore lost to the study.

While not being a random sample of all prescription users in Australia, the results provide a number of insights into the patterns of drug use not previously available. The study classified people into two groups: Pensioner Beneficiaries in one group and the non-Pensioner group of Concessional and General Beneficiaries. The movement between these last two groups made a satisfactory separation of the two impractical.

It should be noted the Pensioner Beneficiaries include pensioners other than Aged Pensioners. The study showed the Pensioner group included a large number of people below aged pension age (Figure 5.16). About 45 per cent of Pensioner Beneficiaries are under 60 years of age and 10 per cent are aged under 20 years. This younger population mainly comprises Invalid Pensioners and Supporting Parent Beneficiaries and their children. Use of PBS drugs by all Pensioner Beneficiaries is likely to be quite different from the use by Aged Pensioner Beneficiaries, for whom separate usage data are not available.

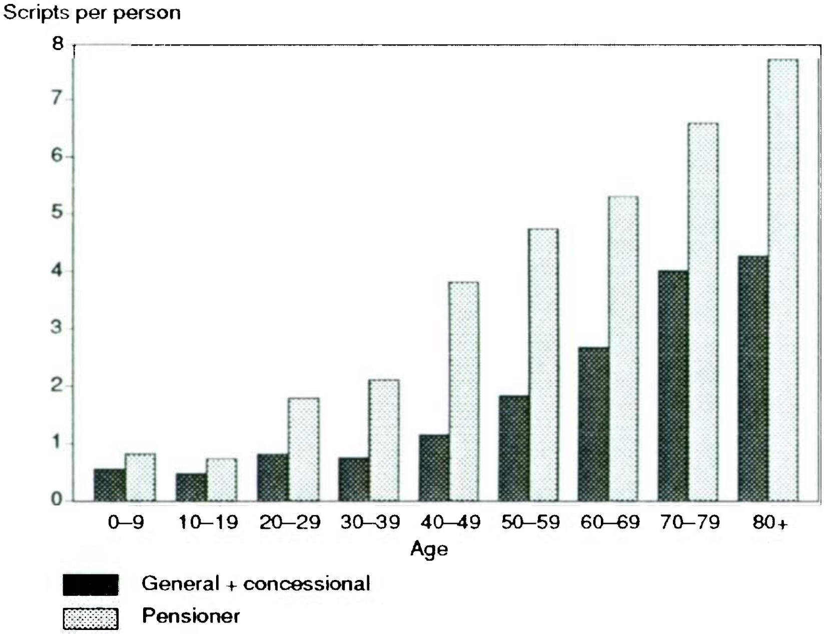
During the three months studied, Pensioner Beneficiaries used an average of 4.3 prescriptions per person, while the non-Pensioner group used an average of one prescription per person. However, the differences in age-sex composition of the two populations accounts for a significant proportion of the difference in use. If the Pensioner Beneficiaries had the same age and sex distribution as the non-Pensioners, but had their own age-sex specific use of prescriptions, the average use would have be 2.1.

Figure 5.17: Pharmaceutical benefit prescriptions per person by sex, June quarter 1985, study areas



Source: Australian Institute of Health unpublished

Figure 5.18: Pharmaceutical benefit prescriptions per person, type of beneficiary, June quarter 1985, study areas



Source: Australian Institute of Health unpublished

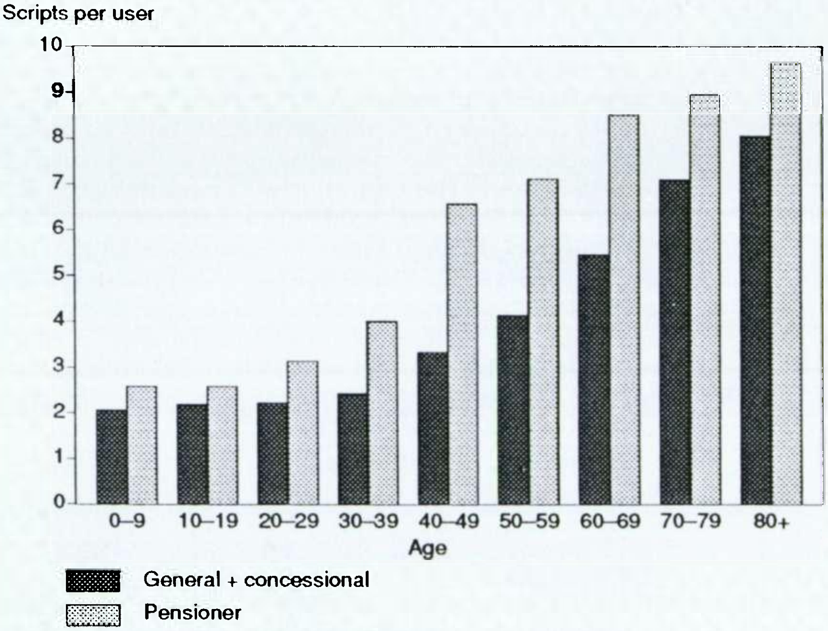
There were clearly significant differences between the use of drugs by people of different ages and different sexes (Figure 5.17). Except for the 0–9 year age range, use of PBS drugs by females was higher than that of males. Use of PBS drugs by females over 80 years of age was about five times the average use in the study area—for males of the same age it was about four times the average.

Age specific use of prescriptions by Pensioner Beneficiaries was higher than for non Pensioner beneficiaries in all age ranges (Figure 5.18). During the three–month period, 60 per cent of Pensioner Beneficiaries used at least one prescription compared with 33 per cent of non–Pensioners.

Figure 5.19 shows the average prescription use of people who used at least one prescription during the study period. The real difference in use by Pensioners and non–Pensioners was smaller than shown in Figure 5.19 because in 1985 Pensioners received drugs costing less than $5 free under the PBS. Non–Pensioners, who were not entitled to this benefit, used such drugs but their use was not recorded and therefore the difference is overstated. Pensioner Beneficiaries were eligible for about 15 per cent more drugs than non–Pensioners.

When adjusted age for age, the difference between Figures 5.18 and 5.19 is explained by the fact that almost two–thirds of non–Pensioner Beneficiaries used no drugs at all during the study period, compared

Figure 5.19: Pharmaceutical benefit prescriptions per person (users only), type of beneficiary, June quarter 1985, study areas



Source: Australian Institute of Health unpublished

with only a third of Pensioner Beneficiaries. The reasons for the difference are not understood, but the most likely contributing factors would be the difference in health status of the two groups, and the prices of drugs to the two groups. To obtain Pensioner Beneficiary status people are required to pass a means test, so Pensioners have lower incomes than non-Pensioners, and many Pensioners are in receipt of benefit because of their health status (eg Invalid Pensioners). During the study period, Pensioners received drugs free of charge while non-Pensioners paid either $2.50 or $4 per prescription.

5.3.4 Commonwealth policy on pharmaceutical drug use

During 1988–89 there were four major aspects of Commonwealth policy on the use of prescription drugs:

- to control or reduce Government expenditure on drugs;
- to direct subsidies to individuals or families with high drug use;
- to promote the efficient use of drugs; and
- to promote the development of the Australian drug industry and drug research in Australia.

Government action to reduce expenditure was reflected in a number of measures: the reduction in the wholesale margins on PBS drugs (January 1988); representations by the Commonwealth to the Pharmaceutical Benefits Remuneration Tribunal seeking to reduce dispensing fees paid to pharmacists (during 1989); and the addition of a number of high priced drugs to the list which required Commonwealth Department of Community Services and Health authority for doctors to prescribe.

The introduction of the Safety Net arrangement in 1986 had the effect of both reducing the rate of growth of Government expenditure on drugs and redirecting the Government subsidy towards people who were high drug users.

In 1988, the Government established the Pharmaceutical Benefits Pricing Authority with responsibility for setting prices for drugs listed in the PBS. One of the factors it was to consider in determining the price was the level of Australian pharmaceutical and research activity. Higher prices are paid to companies undertaking significant research in Australia. These Factor 'F' payments, amounted to $1.3 million in 1987–88 and were budgeted to be $28 million in 1989–90.

The Pharmaceutical Benefits Advisory Committee, which recommends to the Minister which drugs should be listed on the PBS, is required to take into account the cost effectiveness of drugs when making recommendations. The PBAC and its subcommittees also have a role in formulating educational initiatives designed to encourage the rational use of drugs.

5.4 Health personnel

The health industry employs more than half a million people, or 7 per cent of the total Australian labourforce (ABS 6203.0). They are almost evenly divided between the traditional health occupations and other trades and skills required for providing health care and for assuring health.

Between 1978 and 1988, the health labourforce grew steadily, both absolutely and as a proportion of the civilian labourforce, but in 1989 it dropped as a proportion of the civilian labourforce. The reasons and significance are not yet clear (Figure 5.20). (There was a slight drop in 1981, but it was not statistically significant.)

The public sector employs 56 per cent of health industry wage and salary earners, with the remaining 44 per cent employed by the private sector (ABS 6248.0).

Between 1984 and 1989 the numbers of wage and salary earners in the private sector of the health industry increased faster than in the public sector (Figure 5.21).

Women account for about 75 per cent of the health labourforce, a proportion that has remained constant for the past decade. However, the distribution of women across occupations varies; they tend to be in the minority in high status occupations such as medicine and dentistry, but in the majority in other health fields (Table 5.7).

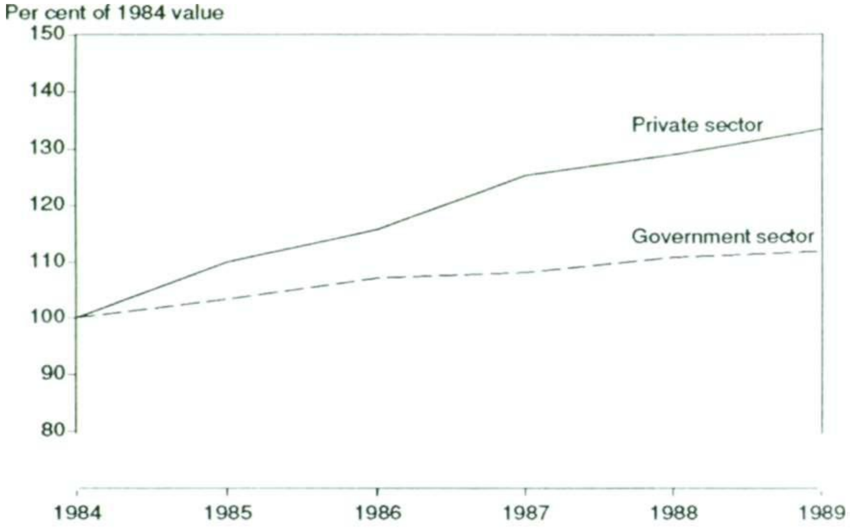
The paid health labourforce is supplemented by voluntary workers and family carers. Actual numbers are not known but their contribution is significant.

Figure 5.20: Employment in the health industry, 1978 to 1989

Note: From April 1986 unpaid family helpers who worked 1–14 hours during the reference week are defined as part-time workers (rather than as unemployed or not in the labour force).

Source: Australian Bureau of Statistics 6203.0

Figure 5.21: Employed wage and salary earners in the health industry, government and private sectors, 1984 to 1989



Source: Australian Bureau of Statistics 6248.0

Table 5.7: Persons employed in selected health occupations(a), by sex at 30 June 1986

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

(a) Ranked in order of female percentage.

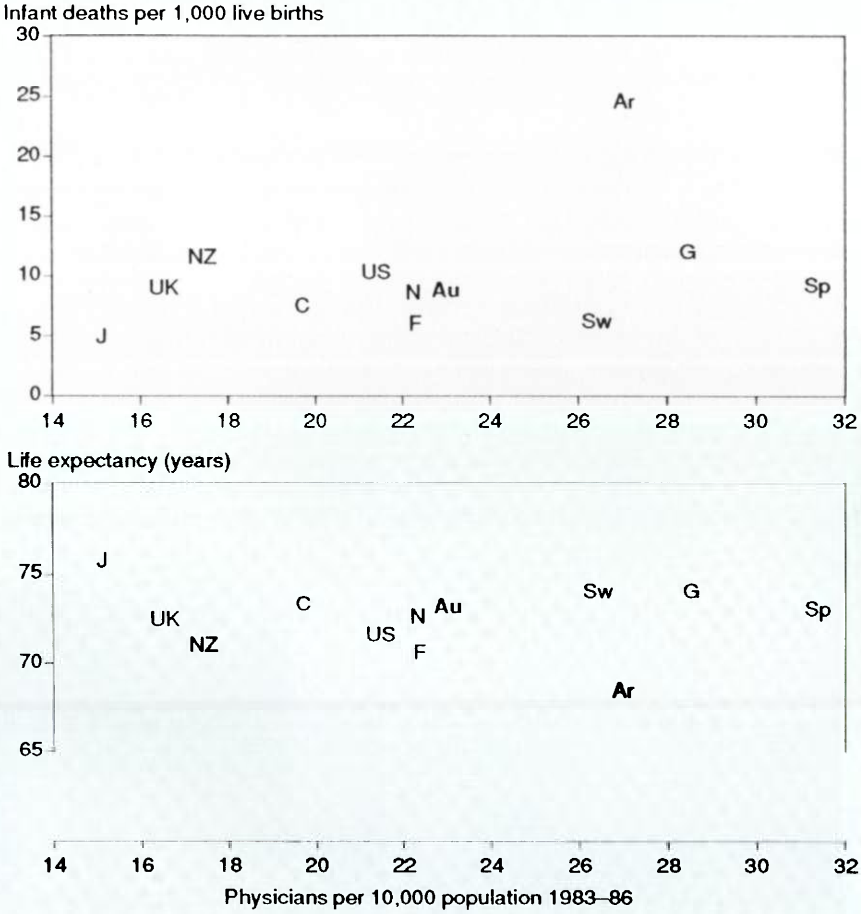
Source: Australian Bureau of Statistics 4346.0

5.4.1 Distribution of health labourforce

Supply of health personnel in a country is generally expressed in numbers per unit of population. The data are usually available and the approach allows simple monitoring of any changes in the relationship and allows some comparison between countries.

However, simple national supply measures used on their own may fail to reflect some significant realities. They provide no indication, for

Figure 5.22: Physician to population ratios, infant mortality and male life expectancy rates for selected countries



J	Japan	F	Finland
UK	United Kingdom	Au	AUSTRALIA
NZ	New Zealand	Sw	Sweden
C	Canada	Ar	Argentina
US	United States of America	G	Greece
N	Norway	Sp	Spain

Note: The latest published statistics have been used for each country.
Physicians per 10,000 population relate to years 1984 to 1986 (UK 1981).
Infant death rates and male life expectancy rates relate to years 1985 to 1988.

Source: World Health Organization 1988, 1989

example, of the concentration of doctors in cities, or in particular parts of cities, nor of areas which are underserviced or overprovided. Simple supply rates are particularly unhelpful in evaluating the provision of specialists or in planning responses to the health care needs of the population.

Supply ratios vary considerably between countries but international comparisons cannot be used to provide target ratios.

There appears to be little connection between, for example, the number of medical practitioners and the health of the population, as measured by infant mortality rates or average life expectancy (Figure 5.22).

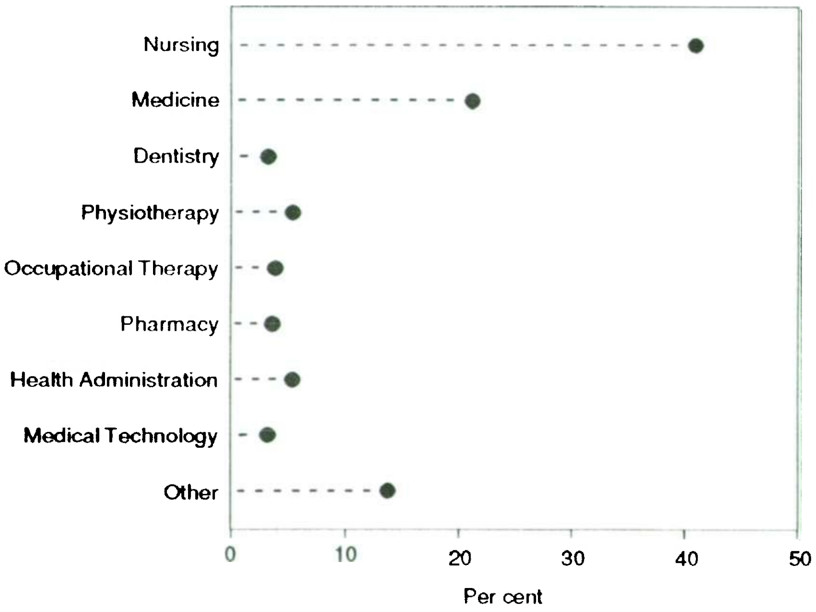
The relationship between the categories of health workers, both in terms of absolute numbers and in the way functions and roles are delineated, has clear implications for the provision of health care. Substitutability and appropriateness of functions are important factors in reducing the impact of fluctuations in numbers of different health practitioners.

5.4.2 Education and training of health personnel

The output of new graduates in the health field depends on a number of factors, including allocation of funding and student places to particular disciplines, availability of teaching staff and physical resources (including clinical facilities), sufficient enrolments for specific courses, and the size of the pool of individuals qualified to enter educational institutions.

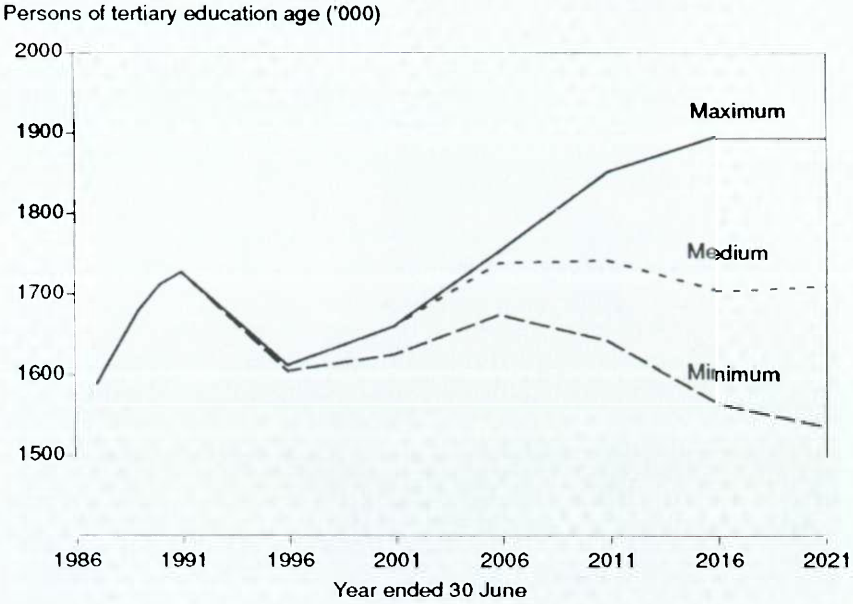
In 1988, 10 per cent of all award course enrolments in higher education were in the health field. Nursing accounted for nearly 41 per cent of all health field enrolments, with medicine accounting for about 21 per cent (Figure 5.23).

Figure 5.23: Students undertaking award courses in health field by type of course, 1988



Source: Department of Employment, Education and Training unpublished

Figure 5.24: Projected population of tertiary education age, 17 to 22 years



Source: Australian Bureau of Statistics 3222.0

Females accounted for nearly 69 per cent of health field enrolments, representing 14 per cent of all female enrolments in award courses. Males accounted for 31 per cent of health field enrolments, representing about 7 per cent of all male enrolments in award courses.

The phased transfer of basic nurse education from hospital based training to the higher education sector, which began in 1984, resulted in an increase of about 9,000 students in the higher education sector between 1984 and 1987. In 1988, about 13,000 students, about 86 per cent of them female, were enrolled in basic nursing courses.

Nearly 77 per cent of commencing students were aged between 17 and 22 years, compared with 55 per cent in all fields.

The size of the 17 to 22 year age group, from which entrants to health courses will largely be drawn, is likely to fluctuate over the next few decades, and this may affect the numbers actually enrolling.

The Australian Bureau of Statistics medium projection for the group aged 17 to 22 years shows a significant drop between 1991 and 1996, followed by a gradual rise to the 1991 peak by about 2006 (Figure 5.24).

The effect of this demographic change on the numbers of students enrolling in health field courses attracting a high proportion of young commencing students is uncertain. In both the United Kingdom and the United States (where a similar pattern of demographic change is expected), concern has been expressed about the likely impact on numbers of students enrolling in nursing studies particularly, and, consequently, the pool of qualified nurses.

5.4.3 Current issues: health labourforce accreditation

Rapid changes driven by technological developments, economic strategies and community expectations are reflected in the health labourforce. Demands for specialist skills generated by new technologies and treatment have led to increased requirements for additional or different training and education for health professions.

Awareness of enhanced skills has increased the emphasis on professionalisation and professional recognition in many health occupations. Professional recognition has been seen as a reward for increased responsibilities and skills, and as a means for negotiating better salaries and wages, working conditions and career structures.

With changing technologies, changing techniques of treatment and preventive therapies, the demarcation of occupational boundaries has become blurred. New occupational sub-groups have sprung up to fill newly created niches (eg rehabilitation counselling, ergonomics, speech therapy aides), often drawing members from more traditional health occupations, and sometimes straddling a number of occupational boundaries. Unease at perceived territorial erosion has resulted in a defensive move towards more stringent requirements for credentials in some areas.

The full transfer of nurse education from from hospital based training to tertiary institutions will not be completed until 1993, yet there is already pressure for the upgrading of nursing studies from diploma to degree level. Other instances are the recent upgrading of radiographer training and more stringent accreditation requirements for cytotechnologists.

There is some ambivalence on the part of health professionals about the use of registration for controlling occupational accreditation. Some groups are considering introducing registration requirements, while others (nursing in particular) are looking at streamlining registration procedures to overcome restrictions on occupational mobility. In occupations such as dietetics, occupational therapy, podiatry, radiography and speech pathology, registration requirements exist in some States and Territories but not in others.

Early discharge of acute hospital patients, mainly because of improved techniques and treatment modalities, has led to shorter lengths of stay. However, some patients no longer requiring hospitalisation need some continuing care in the domestic situation, and the implications have been recognised at government level. The current Medicare funding agreement between the Commonwealth and the States (to cover 1 July 1988 to 30 June 1993) contains incentive packages (to the value of $25.5 billion in the first year), which are designed to promote increased effectiveness in the use of resources in the recognised hospital sector specifically through expanded early discharge to post-acute and palliative care services.

5.4.4 Current issues: shortages and oversupply

The present policy focus in education and training is directed at developing and improving 'the integration and coordination of policies on employment, education and training' (Dawkins 1987).

Medical education (and to some degree, dental education) faces a dilemma trying to match the student intake with the labour market (Box 5.7). The difficulty lies in resolving the balance between annual

Box 5.7: The Doherty Committee

To ensure that medical education and the medical labourforce were appropriate to meeting the future national health care needs, the Commonwealth Minister for Health established the Committee of Inquiry into Medical Education and Medical Workforce in January 1987 under the chairmanship of Professor RL Doherty.

The Committee reported in April 1988 and made recommendations on a number of issues including the system of payment for medical care, the curricula and teaching of medical courses, preregistration training and its setting, training for general practice and training for specialist practice, continuing education, the medical labourforce and the selection of medical students.

In its examination of the medical labourforce, the Committee drew attention to deficiencies in the quality of labourforce data available to it, and said the Australian medical labourforce should be monitored more closely. It recommended the establishment of an ongoing Medical Workforce Review Committee, which began work in November 1989. It is to address a number of priority issues, including the establishment of national medical labourforce data collections.

Strategies for meeting pressures for increased health personnel need not inevitably require extra qualified personnel. Such a solution may not be possible because of limited resources. New technological developments, substitution of personnel, changes in the structural framework of health services might more effective strategies.

output of locally trained graduates and the annual addition of overseas trained practitioners to the medical labourforce when particular sub-markets for medical practitioners appear to be oversupplied.

While there are difficulties in recruiting locally trained doctors to public hospitals and to rural areas, there is a simultaneous oversupply of general practitioners in other areas. Specific recruitment of overseas trained doctors to hospital positions (with restrictions on their right to practice and to remain in Australia) has been proposed but at the same time there are proposals to restrict numbers of overseas trained doctors gaining right of registration and practice in Australia.

Australia, in common with other developed countries, is experiencing imbalances between demand for, and supply of, various health personnel. Perceptions of oversupply have emerged in medicine, particularly in general practice, and in pharmacy. Other health occupations, nursing in particular, are thought to be undersupplied.

There is often a lack of agreement regarding shortages of health personnel, which can be better understood if the conceptual differences between related but distinct approaches to estimating the requirements for health personnel are identified.

Three different approaches to defining 'requirements' are:

- economic demand—the quantity of a particular personnel category that employers state they are willing and able to hire at a given wage;
- clinical need—an estimate of requirements based on clinical criteria and judged necessary for the delivery of adequate or optimal patient care—also influenced by the level of care which is deemed adequate or optimal; and
- past utilisation—this approach implicitly assumes that the levels of utilisation that were observed in the past correctly reflect the level of utilisation that was needed.

Two issues need to be considered when shortages are estimated or assumed:

- is the shortage global, or is it specific to a specialty, geographic region, or economic sector? and
- is the cause of the shortage because of a contraction of supply or to an increase in demand?

For example, the recent shortage of nurses in Australia was largely demand generated. A confluence of several policy decisions generated increased demand. The policies included a shortened working week, the need to replace student nurses providing service with qualified nurses (because of the transfer of nurse education to the tertiary education sector) and the provision of new service programs. Increased work intensity because of shorter hospital stays and the introduction of care-intensive technologies and procedures also contributed to the additional demand.

This increase in demand coincided with a drop in labourforce numbers as a large group of nurses (a bulge because of increases in student intakes in the late 1970s) reached the child-caring age of lowest labourforce participation. The problem was exacerbated by a reduction in student outputs in the early 1980s.

Specific areas often exhibit shortages of various health personnel categories. These include rural areas, geriatric services and intensive care specialties. Finally, the private sector, as it increases its involvement in health care for profit, tends to draw personnel from the public sector. Most of the shortages are experienced in the public sector. Policies generating further growth in private sector health care, such as the export of health services, require careful impact assessment, and where appropriate, complementary labourforce policy development.

5.4.5 Health labourforce forecasting and planning

The provision of an adequate supply of health services is, ultimately, the responsibility of government (irrespective of whether the health personnel are government employees or not, and whether the instruments for fulfilling that responsibility are privately or publicly owned). Public policymakers seek forecasts of the supply of health personnel to provide a perspective on the future balance between the supply and demand of health services.

There have been some large errors in health labourforce forecasting, and the utility of forecasting and planning activities has been questioned. Forecasting efforts can go awry for several reasons:

- policymakers often expect too much and forecasters occasionally promise too much;
- forecasts often trigger remedial interventions to redress identified imbalances; and
- policymakers frequently demand and forecasters supply normative projections which assume an ideal translation from objective need to effective demand—which does not obtain in reality (Reinhardt 1987).

Such limitations, if taken into account and minimised by the availability of appropriate and timely data, need not diminish the role of such health labourforce analysis and information as an essential factor in policy decision-making.

5.5 Health expenditure

The health expenditure information presented in this chapter is based on work by the Australian Institute of Health (AIH 1990; AIH unpublished).

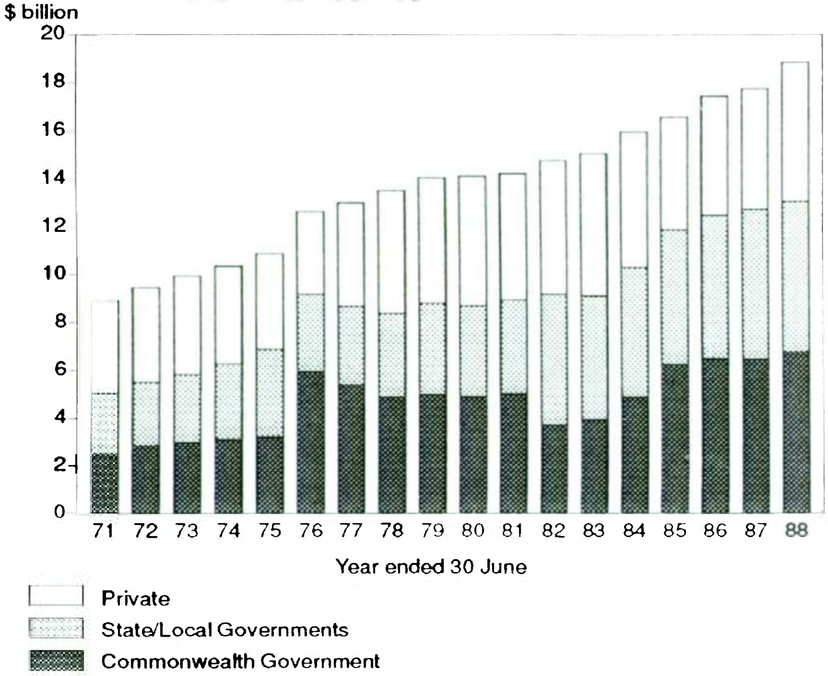
Health expenditure by Australian Governments and individuals in 1987–88 was $23.3 billion, an average of $1,421 per person. This expenditure made up 7.9 per cent of gross domestic product (GDP), a proportion which has remained remarkably stable—within a range of 7.4 to 8.1 per cent—for the past 15 years.

Governments provided 69 per cent of the funds expended on health care in 1987–88 (Figure 5.25). During the previous five years, government expenditure as a proportion of total health outlays rose from 61 per cent in 1982–83 to 72 per cent in 1984–85, followed by a slow decline to the 1987–88 figure. The Commonwealth's share increased from 26 per cent in 1982–83 to 38 per cent in 1984–85 then declined to 36 per cent. State and Local Governments were responsible for 34 per cent of health expenditure in 1987–88, a proportion only 1 per cent lower than the 1982–83 figure.

The Commonwealth funds 36 per cent of total health expenditure, although for areas such as medical services and pharmaceutical benefits it has limited control over how the money is spent.

State and Territory Governments have control over budgetary allocations for public hospitals, including psychiatric hospitals, and for community health and health promotion services. The Commonwealth has some influence on these outlays through Commonwealth–State agreements such as those governing the provision of public hospital services under Medicare, and services for aged and disabled people under the Home and Community Care Program. In addition, the Commonwealth funds and regulates most nursing homes, repatriation hospitals, some community health services (particularly those concerned with Aboriginal health) and some health promotion activity (Box 5.8).

Figure 5.25: Total health expenditure by source of funds, 1970–71 to 1987–88



Note: Expressed in average 1984–85 prices.

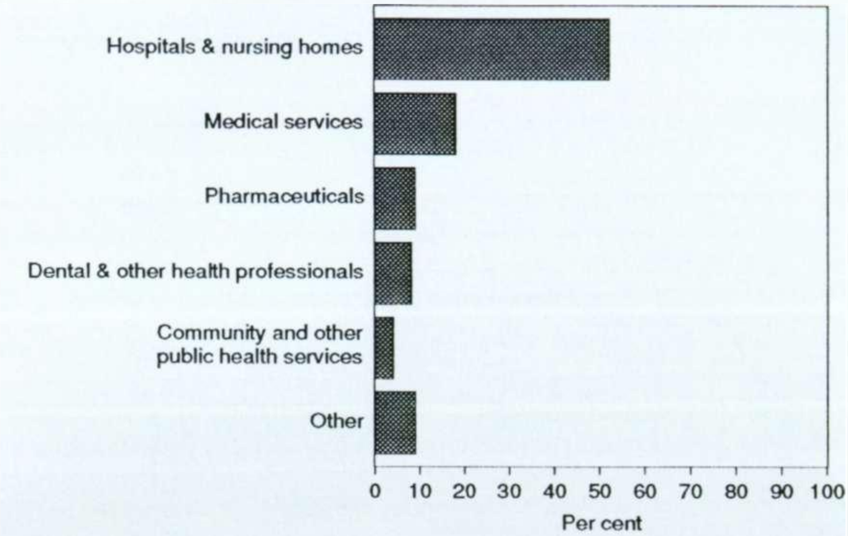
Source: Australian Institute of Health 1988b; unpublished

Box 5.8: Commonwealth Grants Commission

The Commonwealth Grants Commission adopts 'family health services and public health' as a composite category of expenditure that includes outlays on antenatal and postnatal clinics, preschool and school medical and dental services, family planning clinics, control of infectious diseases, drug and other health education programs, and central health administrations, research and planning.

Between 1977–78 and 1987–88, total health expenditure increased by an average of 3.4 per cent a year per person, while expenditure per person on 'family health services and public health' grew by an average of 3.0 per cent a year. Distribution of expenditure between the States and Territories was very uneven (Commonwealth Grants Commission 1982; 1989).

Figure 5.26: Recurrent health expenditure by major area, 1987–88



Source: Australian Institute of Health unpublished

Because responsibility for the funding and administration of different health services falls on different government agencies at different levels of government, Commonwealth–State cooperation is essential to ensure services are provided efficiently and effectively.

For each $100 of recurrent health expenditure in 1987–88, the largest amount, $43, went on hospitals. Another $9 was spent on nursing homes. Expenditure on non-institutional services was distributed in five main areas. Medical services received $18, pharmaceuticals $9, dental services $5 and other health professionals such as physiotherapists and chiropractors $4. Community health services and identified expenditure on health promotion and illness prevention together accounted for another $4 (Table 5.8, Figure 5.26).

In the hospital sector, expenditure by the recognised public and repatriation hospitals increased by an average annual rate of 10.1 per cent from 1982–83 to 1987–88 compared with an 11.2 per cent average annual increase in private hospital expenditure. The private hospital share of acute hospital expenditure increased from 13.7 per cent in 1982–83 to 14.3 per cent in 1987–88.

The areas which increased as a proportion of recurrent expenditure over the five years were medical services (from 17.0 to 18.0 per cent), other professional services (2.7 to 3.5 per cent) and community health, health promotion and illness prevention (3.4 to 3.8 per cent).

The stability in the share of pharmaceutical expenditure at between 8.5 and 8.7 per cent of recurrent expenditure was in contrast to the declining trend of the previous 15 years. From 1969–70 to 1982–83 the pharmaceutical share fell from 19.1 to 8.5 per cent. The large decline in the 1970s was partly because of the worldwide decline in drug prices as patents expired, and partly because of Commonwealth Government pressure on drug prices. The recent increase was mainly because of a wave of new drugs reaching the market.

Table 5.8: Total health expenditure, 1977–78, 1982–83 and 1987–88

($m)

	1977–78	*(a)1982–83*	*1987–88*
Recurrent health expenditure			
Institutional			
Hospitals			
Recognised public	2,443	4,320	6,974
Repatriation	119	207	338
Private	335	716	1,216
Public psychiatric	334	506	812
Total	3,231	5,749	9,340
Nursing homes	516	1,073	1,905
Other	99	240	365
Total	3,846	7,062	11,610
Non-institutional			
Medical services	1,152	2,118	3,888
Dental services	290	565	1,107
Other professional services	146	339	756
Community health, health promotion and illness prevention	184	427	828
Pharmaceuticals	631	1,056	1,863
Other non-institutional(b)	513	915	1,501
Total	2,916	5,421	9,943
Total recurrent health expenditure	6,762	12,482	21,552
Capital health expenditure	532	469	1,280
Capital consumption	176	341	476
Total health expenditure	**7,469**	**13,292**	**23,309**

(a) 1982–83 and later estimates of community health expenditure include an adjustment for community health services funded through hospital budgets and are not strictly comparable with 1977-78..

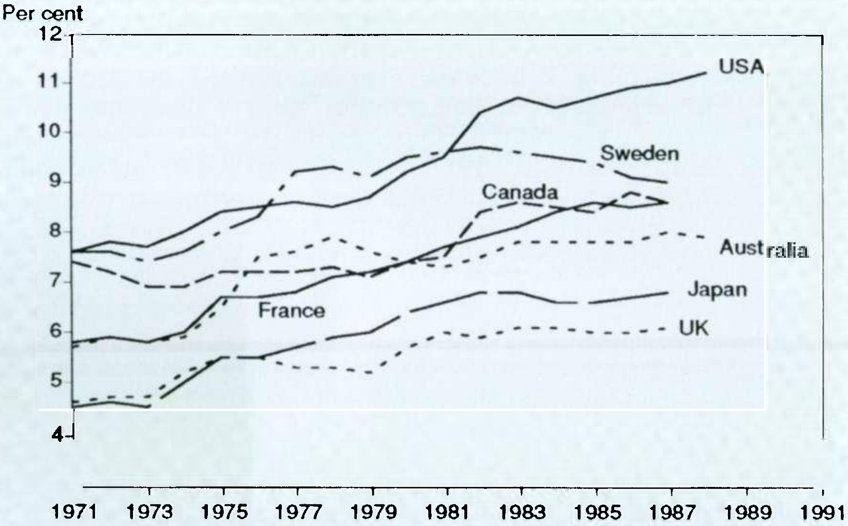
(b) Includes aids and appliances, research, administration and other non-institutional services.

Source: Australian Institute of Health 1988b; unpublished

5.5.1 Comparisons with other countries

Despite problems of comparability of measures of health expenditure by different countries, it is clear most governments have moved to limit increases in health expenditure. Most OECD countries showed a levelling off in health outlays by the mid-1980s (Figure 5.27). The notable exception to this trend has been the United States which has the highest level of health expenditure, and the fastest rate of growth. The fact that there is no indication that such high expenditures has resulted in improved health status for the population demonstrates the need for evaluation of specific health programs and services to ensure expenditures are justified.

Figure 5.27: Total health expenditure for seven countries as a percentage of gross domestic product, 1971 to 1988



Source: Poullier 1989

5.6 Private health insurance

Since the introduction of Medicare in February 1984, the private health insurance funds no longer cover medical practitioners' services outside hospitals. This change and a reduction in the number of people with private health insurance led to a fall in the proportion of the health dollar covered by private health insurance from 20.0 per cent in 1982–83 to 8.8 per cent in 1984–85. Partly as a result of reductions in subsidies to private patients in hospitals, and also of changes in the coverage for in-hospital medical services, the percentage increased to 10.9 per cent in 1987–88. Health insurance funds now pay benefits at a range of levels (see glossary under private health insurance), principally for the following services:

- hospital services received by private patients in both private and public hospitals;

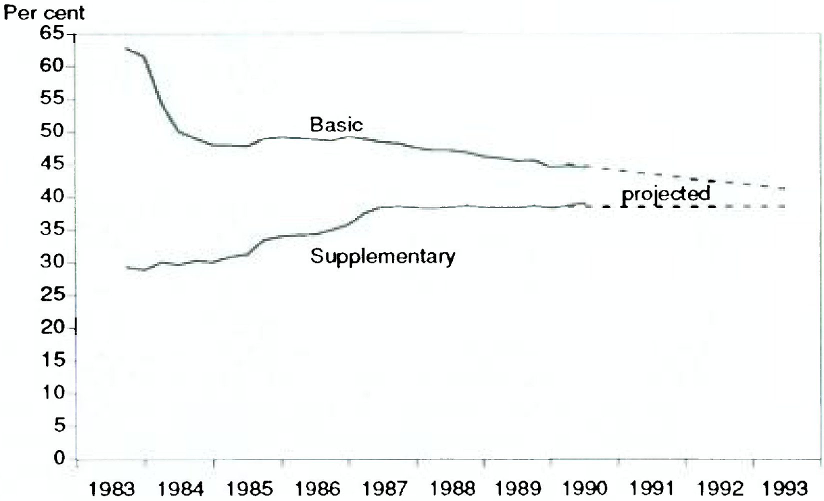
- medical practitioner services received in a hospital by private patients (Medicare pays 75 per cent of the Schedule Fee cost, and the health insurance funds pay 25 per cent);
- dental, chiropractic, physiotherapy, dietetic and other supplementary services rendered by health professionals other than medical practitioners; and
- aids and appliances, especially spectacles.

Total benefits paid by health insurance funds increased by 78 per cent between 1984–85 and 1987–88, with most of the increase occurring in the latter part of the period. The major components were a 62 per cent increase in benefits paid for private patients in public hospitals and an 80 per cent increase in benefits paid for private hospital services.

The larger increase for private hospital benefits mostly reflects the removal of the Commonwealth private hospital subsidy from 1 October 1986. This subsidy cost taxpayers $139.2 million in 1985–86 when it contributed 14 per cent of estimated private hospital costs.

Private insurance against hospital costs has declined since the introduction of Medicare. There was an initial one–off fall in insurance cover from 63 per cent of the Australian population in September 1983 to 50 per cent in June 1984. Since then the decline has been slow and relatively steady, though events such as the temporary withdrawal of services from public hospitals by visiting medical specialists in New South Wales led to occasional interruptions to this trend.

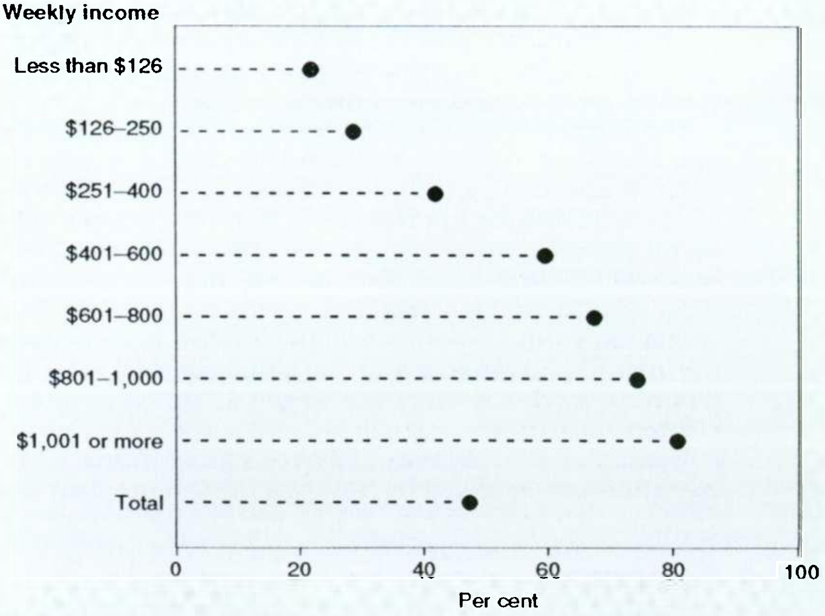
Figure 5.28: Proportion of population covered by health insurance funds basic and supplementary cover, September 1983 to June 1993



Note: Data plotted on a quarterly basis.

Source: Private Health Insurance Administration Council 1990
Projection by Australian Institute of Health

Figure 5.29: Percentage of contributor units with private health insurance by gross weekly income, June 1988



Source: Australian Bureau of Statistics 4335.0

The decline since March 1986 has been steady at 1.1 per cent a year. The latest figures (June 1990) indicate 44.4 per cent of the population had private health insurance for hospital services. If the data from March 1986 are projected forward, coverage by June 1993 would be 41 per cent. (Figure 5.28).

The proportion of the population with supplementary hospital cover increased from 29 per cent to 38 per cent between December 1983 and March 1987, but has since stabilised at between 38 and 39 per cent.

Those with supplementary hospital insurance as a proportion of those with hospital health insurance has increased from 47 per cent in September 1983 to 88 per cent in June 1990. A continuation of this trend would result in 94 per cent of those with hospital insurance having supplementary cover in June 1993.

Private health insurance is strongly related to income (Figure 5.29). The 1988 ABS health insurance survey showed that 81 per cent of contributor units with a gross weekly income exceeding $1,001 had health insurance cover, but only 22 per cent of those contributor units with gross weekly income less than $126 had health insurance.

Age is also an important factor. The young and the old have lower levels of insurance coverage than average. In June 1988, 34 per cent of the 15 to 24 year age group and 36 per cent of the 70–plus age group had private health insurance, compared with 54 per cent of the 35 to 59 year age group. Age and income are related, so it is not clear how much they are independent determinants of insurance status and how much it is because of the two factors acting together.

The 1988 ABS health insurance survey asked people their reasons for holding private insurance. Reasons mentioned included 'security/protection/peace of mind' (45 per cent of contributor units), 'choice of doctor' (40 per cent), 'allows use of private hospital' (34 per cent) and 'shorter wait for treatment/concern over waiting lists' (34 per cent). Since more than one reason was acceptable, these figures total more than 100 per cent.

The financial position of health insurance funds has changed in the last few years. In 1984–85 the funds produced an operating surplus of 2.6 per cent of contributions received but in 1987–88 there was an operating loss of 2.4 per cent. In 1987–88 the funds also had a return on investments and other income of 4.2 per cent of contributions (6.7 per cent in 1984–85) so that despite the operating loss in 1987–88, they were in surplus overall.

The individual experience of the funds has varied widely, largely as the result of differences in the proportion of older people covered, different levels of other income and differences in management efficiency.

Management expenses have declined from 13.5 per cent of contributions received in 1984–85 to 12.6 per cent in 1987–88.

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6 Health care technologies

6.1 Introduction and diffusion of health technologies

Health care technologies can be considered to fall into four main categories: diagnostic, therapeutic, prosthetic and information (Box 6.1). Technologies offer the prospect of improved patient management and quality of life, and there is a natural expectation that hospitals and health services will acquire them as they become available. However, the equipment and procedures are often expensive, they tend to undergo continuous technical change, applications are constantly evolving, and they have the potential to substantially increase the cost of health care.

In Australia, the introduction and diffusion of health technology is determined by a complex interaction of market forces, public funding and regulation. Governments exercise financial and regulatory influence, but other major interested parties—such as professional groups, equipment suppliers, consumer organisations, third party payers, health authorities, local service administrations, and medical specialists—also have a significant influence. As a result, the introduction of technologies may not always be consistent with health care priorities. There is a need for careful evaluation of the costs and benefits of each new technology.

Different countries approach the introduction and diffusion of health technologies in different ways. Due to the high proportion of Australian health care expenditure met by the Commonwealth and State Governments, Australia's approach to the diffusion of health care technology is closer to the regulatory model used in Canada than to the free–enterprise model used in the United States.

Regulation has taken a number of forms. The Commonwealth Government uses its power to control the importation of therapeutic goods under the Customs (Prohibited Imports) Regulations, assessing applications on the basis of safety and compliance with label claims.

In Victoria, the introduction of some new technologies is controlled by certificate of need (CON) provisions under the *Health (Radiation Safety) Act*. State government approval is required before equipment can be installed and operated. This legislation has been used to control the introduction of new diagnostic scanners. No other State has adopted CON legislation; some license various sites to operate technologies such as radiotherapy equipment.

There are other avenues open to government, such as financial incentives through either hospital budgets or setting the rate of Medicare benefits for reimbursement of procedures, but it is generally recognised that these are crude and imperfect ways of influencing the diffusion of technology.

Box 6.1: Definition

Health care technology is defined as any device, pharmaceutical preparation, medical or surgical procedure used in health care and the organisational and supportive systems within which such services are provided.

The devices may be low cost, simple units or highly sophisticated machines. Larger devices often incorporate advanced information handling systems for analysis, presentation and reporting of data and for control of the device.

Procedures range from major plastic and reconstructive surgery, heart transplants and hip replacements, to more traditional surgery such as removal of the gall bladder. Technologies include:

Diagnostic technologies

- Pathology services
  - automated analysers for biochemistry and hematology tests
  - applications of molecular biology (eg to detect genetically linked disorders)
  - analysers which enable biochemical tests to be performed in the doctor's office
  - monoclonal antibody tests to detect infections and blood levels of therapeutic drugs
- Imaging services
  - computed tomography (CT)
  - magnetic resonance imaging (MRI)
  - ultrasound
  - radioisotope scanning

Therapeutic technologies

- chemotherapy and radiotherapy for cancer treatment
- organ transplantation
- cardiac defibrillation
- coronary artery bypass grafting
- extracorporeal shock wave lithotripsy (EWSL) for stones in the kidney and gallbladder

Prosthetic technologies

- hip joint replacement
- cochlear implants for the profoundly deaf
- intra-ocular lens replacements for those blinded by cataracts

Information technologies

- medical information systems
- hospital information systems

Geographic location of high cost technologies is also a major consideration in Australia because the population is concentrated in a few widely separated major urban centres. Some technologies may be of major benefit to only a relatively small number of patients. Therefore, careful consideration has to be given to the location of specialist units and associated equipment. Further consideration is needed to ensure that an infrastructure is available to provide access for outlying patients.

Control through regulation can only be partial. Although government pays for the majority of hospital and medical costs, medical services are provided by independent practitioners, and technologies are acquired as a result of the individual decisions of medical practitioners, non-medical professionals and hospital administrations. Private health insurance companies also influence the diffusion of technology through their reimbursement policies, as do workers' compensation authorities.

6.2 The impact of health technologies

It is difficult to quantify the effects of technologies or to isolate their impacts from other variables which affect health status, the provision of health services and health care costs.

Health technologies can benefit certain groups of patients in terms of disease and disability prevention and improvements in survival and quality of life. However, there is also the potential for inappropriate use, highlighting the need for assessment and clinical and safety standards.

6.2.1 Impact on health status

Changes in behaviour and the environment, such as improved nutrition and housing, have most impact on overall health status. However, technologies also contribute to developments in health care and to some improvements in health status.

Advances in therapeutic and prosthetic technologies have improved the quality of life for many people, and these technologies may become more significant in the future because of the ageing of the population and the increased emphasis on quality of life.

Diagnostic technology is the fastest growing area of health technology, accounting for 25 per cent expenditure on medical services. There is some controversy over the extent to which such developments improve patient management or health status and whether they are cost effective.

Therapeutic technologies often lag behind diagnostic technologies, and, in the short-term, the benefits of some diagnostic technologies may not be commensurate with the costs. In the long term, improved diagnostic capability may contribute to improved understanding of diseases and ultimately to improved management.

A number of studies have identified investigative procedures which do not necessarily improve patient outcome. Emergency endoscopy in patients with upper gastrointestinal bleeding provides increased diagnostic information without altering surgery rates, hospital stays or mortality (Peterson et al 1981; Drofield et al 1982). An Australian study on antenatal fetal heart rate monitoring, (Lumley 1987) identified no benefit in outcome (sickness and disease or mortality of the fetus/neonate) from electronic monitoring of high risk confinements. Nevertheless, the use of this technology has increased.

The desire to improve patient safety (and reduce potential litigation) can stimulate the development and adoption of new technologies. Computerised tomography has largely replaced pneumoencephalography with consequent reductions in side effects. Magnetic resonance imaging has largely replaced the invasive technique of myelography in many applications in centres where it is available. Recently developed non-ionic contrast agents, used in diagnostic imaging, reduce the risk of adverse reactions by a factor of four.

Any investigation or intervention carries some risk for the patient. The health status of health care providers may also be adversely affected by technology developments. Occupational risks can, for example, be associated with technologies used in imaging, radiotherapy, chemotherapy and laboratory services. An example of a technology designed to improve occupational health is automated afterloading in brachytherapy (a technique in which radioactive material is implanted in patients being treated for cancer). While automated afterloading systems improve staff protection against radiation exposure, the estimated cost of preventing a fatal cancer in operating staff through the use of such equipment is very high (NHTAP 1989a).

Many health technology developments extend survival for individuals or specific subpopulations. These include anesthesia, the positive pressure ventilator, the cardiac defibrillator, organ transplantation techniques and the insulin pump. However, the potential for improving longevity on a population basis is limited.

New technologies can improve health outcomes at lower costs, for example through preventive applications or less invasive procedures. Yet many health technologies provide health benefits at the cost of higher financial outlays as exemplified by the introduction of renal dialysis and coronary artery bypass surgery. Both have increased health care costs while making possible extended survival and improved quality of life. Quality of life is becoming increasingly important in considering the impact of health technologies. Attempts are being made to develop measures of the comparable 'worth' of health interventions. These measures, such as quality-adjusted life year (QALY) indices, take into account the impact of interventions on the subsequent duration and quality of life for the patient. The development of QALY indices involves sampling opinions on the relative value of different health states. Difficulties lie in the measurement of 'quality'. Difficulties also lie in balancing the views of various subpopulations and age-groups to derive a value which reflects both informed and broad community opinion.

6.2.2 Impact on service delivery

Information technologies aid the collection, analysis and distribution of large volumes of health information, including clinical and managerial data. Such data assist health service planning and evaluation, and can indirectly affect the organisation of health services. Computerised analysis of health and health-related information is being used to identify locations where the altered demographic or health profile indicates the need for a different mix of health services.

Decentralisation of specialised health services has been assisted by electronic transfer of diagnostic and management information between specialised and satellite centres. Information retrieval systems have improved access to medical knowledge, and mass media technologies have extended accessibility to health information.

Health technologies affect service delivery settings. For example, many patients requiring renal dialysis, parenteral nutrition or assisted ventilation are maintained at home rather than in hospital. Advances in telecommunications, robotics and micro-electronics have enhanced the potential for self-care for the disabled. Emergency alert devices make it more realistic for the elderly or frail to remain in their homes rather than move to a nursing home environment.

The trend towards home care represents a devolution of responsibility for technological support systems from health professionals to the patient. If expert medical systems become publicly available, patient autonomy may be further enhanced.

Changes in technologies and their availability at the various levels of health service provision may affect the role and distribution of health care workers, and their relationship with patients.

Technologies may demand specialised knowledge and expertise which in turn promotes specialisation, division of labour and centralisation of services. It has been argued that social processes determine the response to technological innovation (Daly and Willis 1987). They suggest that changes in the labourforce may be stimulated by the introduction of a technology but the outcome is primarily determined by social factors.

Technology development carries the potential for labour displacement. However, in the health sector, it has been argued that the introduction of most technologies has tended to increase both capital and labour inputs, and so promote the creation of new specialties without displacing other occupational groups (Daly and Willis 1987).

Support services (such as pathology) which do not deal directly with patients are more likely to adopt automated processing techniques. While the development of pathology services in recent years has included an increase in subspecialisation, the introduction of new technologies has altered the skill mix required to operate the services. Technology development in some subspecialties has reduced the need for skilled scientific personnel; the reverse effect is evident in others.

6.2.3 Impact on health care costs

Attempts have been made to measure the overall effect of health technology on health costs. However, given methodological limitations, it is not surprising that the results of such studies are conflicting.

Most studies examine the contribution of technology to hospital costs by isolating the impact of all other known factors and treating the residual as 'technology'. These studies indicate that, overall, technological change has positively contributed to increased health costs. Largely, it is the extent of the contribution which is debated (Wadman 1972; Warner 1979; Banta 1983; Cheah and Doessel 1989).

One method for assessing the impact of technology on health costs is to focus on individual technologies or groups of technologies. In Australia, 'small ticket' technologies (such as pathology tests) make a significant contribution to overall health costs because of the volume of use. Pathology services accounted for 16 per cent of Medicare outlays in 1986.

In the broader economic context, health technologies can affect the balance of trade. For medical and scientific equipment, the value of imports into Australia is five times the value of exports. In 1988, imports were approximately A$2 billion and exports A$0.4 billion.

The propensity to add new technologies to the existing inventory rather than replacing older methods adds to health care costs. When the new technology is of similar or better utility and carries less risk of side effects, it is likely to be introduced regardless of the cost comparison, but full replacement of the existing technology may only take place after a considerable time.

New diagnostic technology, providing similar information to that obtainable with existing methods, may be used in a complementary manner rather than as a replacement. In other cases the information provided by the new method may be unique, but may have limited influence on the therapeutic decision taken on the basis of other information.

Complementary effects also occur when the new technology enables services to be provided to additional patients. For example, it appears that a major effect of the introduction of coronary angioplasty in Australia may be the treatment of additional patients, rather than the replacement of coronary artery bypass graft (CABG) surgery (NHTAP 1989b).

Another factor contributing to the additive effect of technology is inappropriate utilisation. Jennett (1988) has suggested expensive health technology may be used inappropriately in situations where it is:

- **unnecessary** because the patient's condition is not serious enough to justify it;
- **unsuccessful** because the patient's condition is too far advanced to respond to the intervention;
- **unkind** because it prolongs life of poor quality;
- **unsafe** because the expected complications outweigh the anticipated benefits; or
- **unwise** because it diverts resources from other health care activities that would bring greater benefits.

To minimise inappropriate utilisation, broad dissemination of technology assessment findings to relevant groups (such as health professionals, health service planners and consumers) and ongoing quality of care programs for health professionals are necessary.

6.2.4 Other impacts

Health technologies can also have important social, ethical and legal implications. Technological advances both influence and reflect changing social norms.

The use of high cost intensive care facilities to prevent or postpone death, and, at the other end of the spectrum, discussion of living wills and euthanasia, reflect changing societal attitudes towards death and the individual's autonomy. Changing attitudes towards body image and disabilities reflect and promote advances in plastic and microsurgery, prosthetic technologies and technologies designed to counter infertility.

When societal values are outpaced by technological advance, ethical and legal difficulties arise. Areas where such problems have arisen include accessing organs for transplantation, the definition of death, the status of the embryo and fetus, surrogate childbearing and genetic engineering.

6.3 Health technology assessment

As in other countries, there is an increasing trend in Australia to evaluate technologies before their widespread use is supported. Such evaluations are complex, and appraisal of costs and the effectiveness of health care technologies may require several years. This process (Box 6.2) has the potential to define the place of the technology in the health care system and inform policymakers of the anticipated benefits and costs. It allows informed decisions to be made as to the acquisition and possible reimbursement of emerging technologies.

Health technology assessment provides the information needed to facilitate rational decision making on health technologies (Box 6.3). It can assist organisations and individuals to avoid expenditure on ineffective or unproven technologies, or high cost technologies which have no advantage over lower cost alternatives. It can also give information on the optimum number, distribution and methods of use of technology items to meet the needs of health care.

The outcome of an assessment in terms of effect on health care delivery depends on policymakers. Although the results of an assessment can make an essential contribution to consideration of a technology by governments and health professionals, other factors will necessarily have a major influence on the policy process.

In practice, assessments can examine only a limited range of effects over a given period in the life cycle of a technology. Follow-up assessments may reveal quite different usage patterns and effects to those that had been anticipated.

Box 6.2: The assessment process

The US Office of Technology Assessment (1978) has listed identification, testing, synthesis and dissemination as key stages in the assessment of a health care technology.

- **Identification: monitoring technologies, determining which need to be studied, and deciding which to study has an 'early warning' function. Technologies which could have a significant impact on health care or its costs are identified in time for them to be assessed before policy decisions are necessary.**
- **Testing: conducting the appropriate analyses or trials; may be undertaken to determine safety, efficacy and performance in comparison with existing technologies, if this information is not already available. Cost data may also be collected.**
- **Synthesis: collecting and interpreting existing information including the results of the testing stage, and, usually, making recommendations or judgements about appropriate use; In the synthesis stage, data are gathered from the analyses and trials in the testing stage. In addition, data may be required on the performance and usage of alternative technologies, and the incidence or prevalence of the condition concerned. Ideally the assessment process should aim to provide quantitative measures of the efficiency of technologies under comparison, for example through cost effectiveness or cost utility analysis. The process should be multidisciplinary, involving clinicians, scientists, economists and epidemiologists. At the same time the assessment process needs to be flexible.**
- **Dissemination: providing the synthesis of information, or any other relevant information, to the appropriate parties who use medical technologies or make decisions about their use.**

While some assessments may be lengthy and involve primary data collection and detailed analysis, it should be possible for assessment bodies to provide broad, non-detailed advice quickly when this is required by decision makers.

Consideration of the efficiency of a health technology should be set in the context of its lifecycle progression from research through introduction, diffusion and maturity to eventual obsolescence. Experience at the diffusion stage may feed back to applied research, leading to the development of improved devices or procedures for the same task. Over time, costs may change, or totally different approaches to the conditions concerned may evolve. Thus the place of a technology in health care is subject to complex changes over a period of time. It is important for health technology assessment to keep pace with the changes. A technology should ideally be tracked through its life cycle, following the initial assessment.

Box 6.3: Information provided by assessment

- **Stage of development**
  Development of a technology proceeds from basic research through laboratory testing and clinical trials to commercialisation. In the case of pharmaceuticals (other than herbal or homeopathic products), regulatory processes ensure that in Australia commercialisation does not occur before rigorous trials. In the case of devices, commercialisation often occurs on the basis of very limited clinical data. The development process for a procedure can be particularly complex, perhaps depending on several strands of research or the availability of several types of device.

- **Safety**
  Safety considerations include mechanical reliability, hazards posed to the patient or the operator, side effects, complications, long-term effects or genetic damage. Thorough assessment of safety should always precede commercialisation, and mechanisms should be put in place to monitor long term adverse effects. Some diagnostic procedures have a higher risk than others, for example if ionising radiation or contrast media are involved.

- **Efficacy and effectiveness**
  Assessment of the *efficacy* of a technology concerns appraisal of its performance under ideal conditions. Its *effectiveness* is the measure of its performance and benefit under average conditions of use, for example after diffusion from centres of expertise responsible for the controlled trial stage, to a much wider distribution of individuals and establishments. Benefits may include cost savings, clinical improvements and gains to quality of life.

- **Efficiency**
  Efficiency is taken to mean the degree to which it is economical and worthwhile to use a technology in the context of a health service with limited funds. Production and allocative efficiency questions may be raised. Production efficiency issues include consideration of whether cheaper alternatives are available, how much of the technology is needed and how it should be located. Protocols designed to ensure substitution of an older technique by a lower cost, equally effective new technology can be regarded as conducive to production efficiency. Allocative efficiency issues include consideration of the extent to which technologies should be acquired at the expense of other health care programs, or at the expense of other activities.

6.3.1 Difficulties and limitations of assessment

Health technology assessment can be limited by difficulties in obtaining the data required, and by constraints on the assessment agencies themselves.

A frequent difficulty is the lack of data on the comparative performance of technologies. The effect of a technology on patient outcome may be a key factor in determining its efficiency. However, outcome data may require long–term studies, or be difficult to access. Moreover, complex patterns of usage may mean that results for one area of application may not apply to another.

Lack of data may limit the ability to apply formal analytical techniques such as cost utility analysis in an assessment. It is often necessary for judgements and recommendations to be formulated on the basis of limited data which address only some of the components required for such an analysis. It is also true that the nature of the evidence is usually such that even the most rigorous analyses have statistical weaknesses or wide confidence limits which make them potentially disprovable. All conclusions are tentative (Hailey, Crowe and McDonald in press).

Rapid change in technology means that assessment has a moving target. It can be difficult to determine the appropriate time to for assessment. If done too soon, it may quickly be out of date. If left too late, policy decisions may be necessary before it is completed.

Even with such difficulties, health technology assessment has a valuable role in assisting decision making by health care providers and policymakers. In spite of its complexities and limitations, technology assessment is desirable because it helps to avoid use of scarce resources for procedures without value, and to set priorities among alternative expenditures for medical care. Even imperfect methods can be expected to lead to better informed decisions than would otherwise be possible.

6.3.2 Health technology assessment in Australia

Australia's level of health technology assessment activities compares favourably with that in most other countries of similar size. In Canada, health technology assessment agencies have been established only since 1988 (although hospital and university–based assessments were being undertaken before then). Among other smaller countries, Sweden and the Netherlands are particularly active, with national bodies as well as other centres involved. The larger industrialised countries (except the United States) tend not to have centralised authorities for health technology assessment and activity is more diffuse.

The United States is the most active country in this field. The pattern of assessment activity there is complex with a number of organisations undertaking assessments from different perspectives, both in the public and private sectors.

Until the early 1980s Australian assessment of new technologies, other than pharmaceuticals which have had a comprehensive assessment for safety and efficacy for many years, tended to be carried out by ad hoc committees, through work supported by NHMRC or other funding bodies, and by private sector agencies and professional bodies. These approaches provided useful input into health care planning but often the results were limited.

A National Health Technology Advisory Panel (NHTAP) was formed in mid-1982. It has had a permanent secretariat since 1984, which is now located in the Australian Institute of Health. Its tasks include assessment of both emerging and significant existing health care technologies.

The AIH Health Technology Unit also undertakes assessments in its own right and supports the Superspecialty Services Subcommittee of the Australian Health Ministers Advisory Council, which prepares guidelines to assist in planning and delivery of specialised health services.

Health technology assessment is undertaken on an ad hoc basis by State Government authorities and by private sector consultants. However, it is the NHTAP which has had the major impact in this field in Australia. Examples of NHTAP assessments which have contributed significantly to policy decisions include the evaluation of MRI (Section 6.5.2), trials of dry chemistry pathology equipment, and assessments of shock wave lithotripsy for kidney stones and gallstones.

NHTAP and the AIH Health Technology Unit maintain contact and information exchange with major health technology assessment agencies in other countries, as well as the World Health Organization. In this way, duplication of effort is avoided, and Australia makes an important contribution to international understanding of the role of technology in health care.

6.4 Usage data for selected technologies

6.4.1 Computerised tomography

Computerised tomography (CT) is a radiographic technique in which X-ray images representing slices through a patient are reconstructed by computer to provide views of body structures.

CT scanners cost up to $1.5 million although cheaper units are being marketed for about $500,000.

During 1988-89 medical benefits totalling $67.3 million were paid for more than 328,660 CT services.

The technology is widely distributed in Australia with 8.6 CT scanners per million population in 1985, compared with 29.2 per million in Japan, 14.7 per million in the United States and 2.3 per million in the United Kingdom (Table 6.1). By mid-1987 the Australian figure had risen to 10.8 per million.

The number of CT scanners in each country reflect the different health care systems and the variation in referral patterns, availability of other methods, approach to diagnosis and management, medico-legal pressures, and patient demand and reimbursement mechanisms. The presence of domestic production of CT scanners might have influenced numbers in some countries.

CT Scanning in Australia (NHTAP 1988a) documented the effectiveness of CT in many situations, but noted that little quantitative information was available on how CT was used in Australia or its effect on patient management.

Table 6.1: CT scanners in use in selected countries, 1985

(Per million population)

Country	*Scanners*
Japan	29.2
United States	14.7
Australia (1988)	8.6
West Germany	7.3
Switzerland	6.2
Sweden	5.6
Austria	4.0
The Netherlands	3.1
France	2.8
United Kingdom	2.3

Source: National Health Technology Advisory Panel 1988a

6.4.2 Pathology services performed outside laboratories

Office pathology represents about 1 per cent of total pathology services in Australia (Table 6.2). In the United States pathology testing in doctors' offices represents 25 per cent of all pathology testing and is reported to be the fastest growing area of such diagnostic services in that country.

Because the US has different reimbursement and regulatory arrangements for pathology, caution should be observed when extrapolating the US trends to Australia.

However, the number of 'doctors office' pathology tests for which medical benefits have been paid in Australia has been increasing since 1979 (Figure 6.1). The recent increase in numbers of such services may in part be associated with availability of instrumentation and kits designed for use by people without laboratory experience.

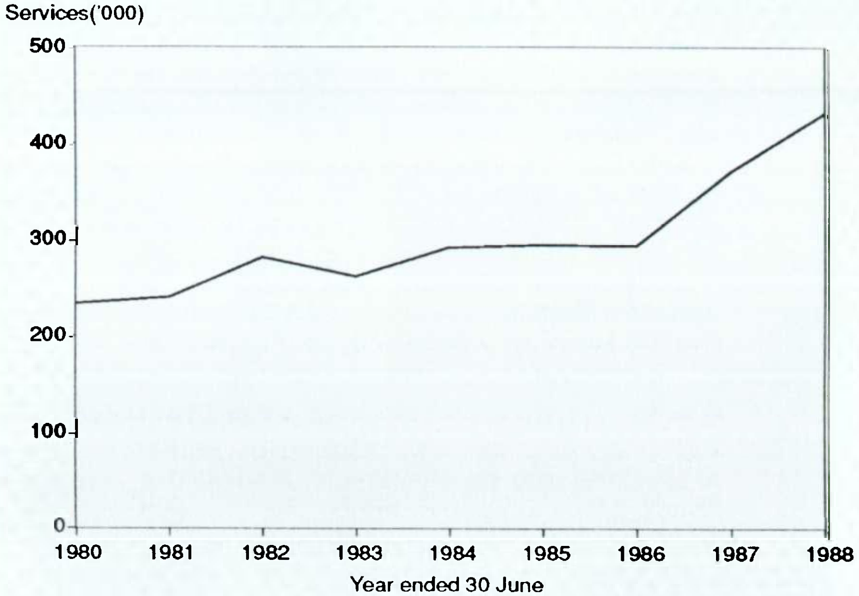
Table 6.2: Specimens examined per month by doctors' office laboratories, 1987–88

('000)

Type of test	*Specimens examined in doctors' offices*	*Total specimens examined*
Hematology	9.3	1,362.3
Blood banking	1.6	190.2
Biochemistry	25.6	1,627.2
Microbiology	6.8	1,117.1
Immunology	2.2	184.8
Anatomical pathology	0.5	199.6
Cytology	1.1	208.7
IVF and pregnancy	4.8	81.1

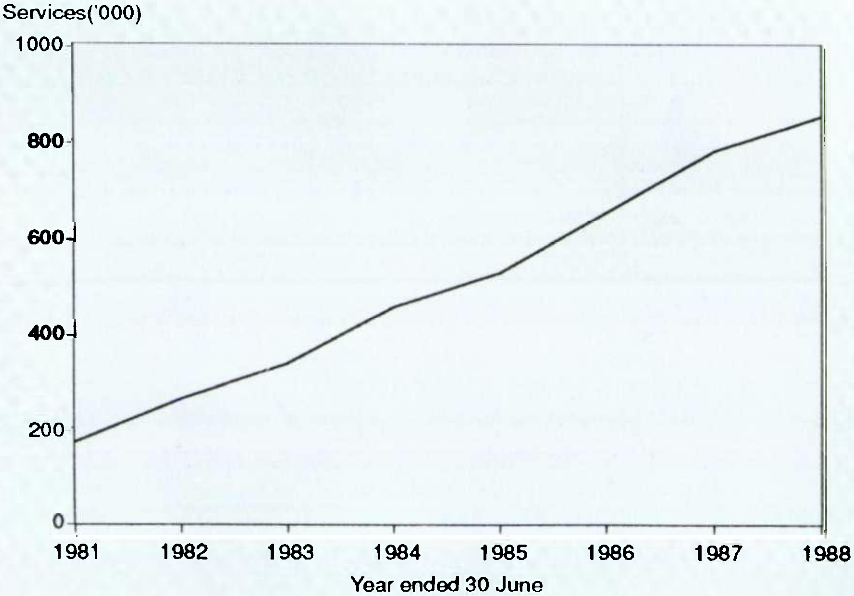
Source: Hynes, Lea and Hailey 1989

Figure 6.1: Doctor's office pathology testing services, 1979–80 to 1987–88



Source: Commonwealth Department of Community Services and Health 1989

Figure 6.2: Ultrasound services, 1980–81 to 1987–88



Source: Commonwealth Department of Community Services and Health 1989

6.4.3 Ultrasonic imaging

Ultrasound is used routinely in obstetrics for assessment of fetal viability, age, size and growth. More generally it is used for organ imaging and tissue characterisation. Doppler echocardiography is used to study intravascular blood flow and motion of cardiac structures. More recently its application to measurement of pressure gradients across valves has stimulated considerable interest in the assessment of the severity of valve stenoses.

It is relatively inexpensive compared with other diagnostic imaging techniques such as CT. The low unit cost of much ultrasound equipment together with its portability and wide range of applications has made it one of the most extensively used imaging modalities.

In 1988–89, 952,617 ultrasound services for which a medical benefit was paid were performed in Australia, showing a more than fivefold increase since 1980–81 (Figure 6.2).

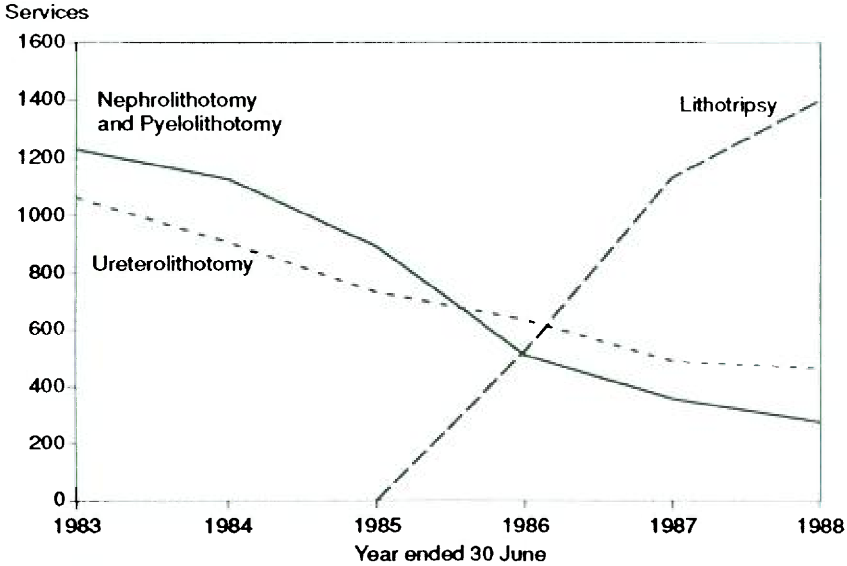
6.4.4 Extracorporeal shock wave lithotripsy

Extracorporeal shock wave lithotripsy (ESWL) was developed to treat kidney and upper ureteral tract stones. The technique uses focused shock waves to shatter stones, the fragments of which are normally small enough to be passed in the urine.

This high cost technology was introduced into Australia in 1986 and at May 1990 there were three units for treating renal stones—two in Sydney and one in Melbourne.

In 1988–89, Medicare benefits were paid for 1,397 ESWL services. The use of alternative surgical procedures paid for under Medicare

Figure 6.3: Renal stone treatment, 1982–83 to 1987–88



Note: Extracorporeal shock wave lithotripsy (ESWL) commenced in Australia in December 1985.

Source: Commonwealth Department of Community Services and Health 1989 has decreased, although the decline began before the introduction of ESWL in 1985 (Figure 6.3).

Percutaneous techniques for stone removal (such as percutaneous nephrolithotomy—PCN) became established in Australia in the early 1980s. They have contributed to decline in the rates of open surgery for renal stones, and in some cases are used in conjunction with ESWL. PCN is an attractive option for patient treatment at centres which do not have ESWL.

Application of ESWL has been extended to the treatment of stones in the gallbladder and bile duct with encouraging results. However, a recent report by NHTAP (1988b) concluded the technology should not be used in Australia for routine clinical treatment for gallbladder or bile duct stones in Australia, given the limited data available.

A biliary ESWL machine now operates at St Vincent's Hospital, Melbourne, and data are being collected on its costs and effectiveness.

6.4.5 Renal dialysis

Patients with end-stage renal failure (ESRF) have permanent deterioration of renal function which will result in death unless some form of renal replacement therapy is instituted.

There are two principal treatments for ESRF—dialysis and kidney transplantation (Section 6.4.6).

With dialysis, the patient's blood is diverted to a semipermeable membrane, which allows wastes and excess fluids to be removed. Patients on a kidney machine typically require dialysis three times a week for between three and six hours a session. A variant treatment, which is less demanding on the patient, is continuous ambulatory peritoneal dialysis (CAPD). A catheter is inserted into the patient's abdominal cavity through which dialysate fluid is introduced and the old fluid is exchanged for new several times a day.

In Australia, between October 1987 and 1988, 5,399 people (327 per million) were treated for renal failure, of whom 2,598 (157 per million) were dialysis dependent (Table 6.3). About 30 per cent were on CAPD treatment. This proportion was lower than in New Zealand where about 44 per cent of dialysis-dependent people were on CAPD.

Table 6.3: Renal dialysis patients and proportion on CAPD, Australia and New Zealand, 1984 to 1988(a)

Patients on dialysis	*1984*	*1985*	*1986*	*1987*	*1988*
Australia					
Number	2,108	2,174	2,298	2,462	2,598
Per million population	136	138	144	152	157
Proportion on CAPD (%)	28	27	28	30	30
New Zealand					
Number	360	379	398	434	469
Per million population	111	115	122	134	140
Proportion on CAPD (%)	40	41	42	43	44

(a) Year ended 31 October.

Source: Australia and New Zealand Combined Dialysis and Transplant Registry 1989

In 1983 in the United Kingdom 153.1 people per million were treated for renal failure, 55.6 per cent of whom were on dialysis (Halper 1985).

The differing rates of dialysis treatment from year to year within and between countries reflect the incidence of ESRF, availability of donor organs for alternative transplant therapy and level of health care resources. Varying attitudes towards rationing of services, such as acceptance of age limits for recipients, also influence rates of dialysis.

The increasing numbers of patients, support staff required for dialysis and cost of equipment and consumables is causing some concern in Australia. The estimated cost of the dialysis program in New South Wales alone in 1987 was $28.3 million. Annual estimated costs for home dialysis in New South Wales, excluding the first year, are in the range $14,000 to $19,000 per patient. Hospital–based dialysis treatment is significantly more expensive at about $44,000 per patient.

6.4.6 Transplant technology

Organ transplant programs generate very significant costs to the health care system because of their use of specialised resources. However, these programs may be cost effective if they replace lengthy hospitalisation and intensive nursing services and permit return to an independent lifestyle. Success rates have improved dramatically in the past decade, largely because of the the use of improved immunosuppressive drugs which have lowered organ rejection rates. The availability of donor organs limits the number of procedures performed.

Heart transplants

Between 1984 and 1988, 149 heart and heart/lung transplants were performed in Australia (Table 6.4). The number of procedures in 1987 corresponded to a rate of 1.8 per million compared with 4.6 per million in the United States and 4.8 per million in the European Community.

Table 6.4: Heart transplants, 1984 to 1988

Heart transplants	*1984*	*1985*	*1986*	*1987*	*1988*
Number	14	23	35	29	(a)48
Deaths within one month	3	2	2	2	2

(a) Includes one heart–lung transplant.

Source: National Heart Foundation of Australia 1990

Renal transplants

In 1988, 448 renal transplants (27 per million population) were performed, compared with about 24 per million population in New Zealand (Table 6.5). The rates for the United Kingdom and United States were similar in 1983 at 28 patients per million population (Macpherson 1986). Between 1980 and 1988, kidney transplant programs in the European Community and the United States expanded dramatically, showing growths of 130 per cent and 113 per cent respectively.

Table 6.5: Kidney transplants, Australia and New Zealand, 1984 to 1988(a)

	1984	*1985*	*1986*	*1987*	*1988*
Australia					
Renal transplant operations					
Number	420	412	428	407	448
Per million population	27	26	27	25	27
Functioning transplants					
Number	1,975	2,164	2,390	2,583	2,801
Per million population	127	137	150	159	169
New Zealand					
Renal transplant operations					
Number	78	83	102	77	81
Per million population	24	25	31	24	24
Functioning transplants					
Number	341	374	417	446	475
Per million population	106	113	128	137	142

(a) Year ended 31 October.

Source: Australia and New Zealand Combined Dialysis and Transplant Registry 1989

Liver transplants

Three Australian centres have performed liver transplants. The Queensland Liver Transplant Program, based at the Princess Alexandra Hospital, the Royal Children's Hospital and the Royal Brisbane Hospital, began in January 1985. The National Pilot Liver Transplant Program in Sydney, based at the Royal Prince Alfred Hospital and the Children's Hospital, began in January 1986. The program at the Austin Hospital in Melbourne began in 1988. At March 1989, a total of 147 transplants had been performed on 135 patients in Australia (Table 6.6). The 51 transplants performed between August 1988 and March 1989 represent an annual rate of 5.2 per million.

Table 6.6: Liver transplants to August 1988 and to March 1989

(Number)

	To August 1988	*To March 1989*
New South Wales		
Transplants	*38*	*55*
Patients	*34*	*50*
Victoria		
Transplants	*3*	*7*
Patients	*3*	*6*
Queensland		
Transplants	*55*	*85*
Patients	*51*	*79*

Source: Powell 1989

In 1988, the European Community had a rate of 3.4 per million and the United States had a rate of 5.2 per million. Donor procurement remains the critical limitation to the procedure both in Australia and overseas.

The costs of the procedure are difficult to estimate and many are absorbed in standard hospital services. However, several estimates of around US$50,000 for the preoperative work up, operation and immediate post–operative care have been made (Powell 1989).

6.4.7 Radiation therapy

Radiation oncology for the treatment of cancer is provided by 20 centres in Australia at an estimated cost of $800 million a year (Australian Health Ministers' Advisory Council 1987). A recent survey indicated that there are 47 megavoltage machines operating in Australia, with 23,379 new courses of treatment begun in 1987–88. Medicare benefits totalling were paid on 320,701 services in 1987–88 (Table 6.7).

Table 6.7: Radiation therapy procedures, 1980–81 to 1987–88

	(Number)
Year	*Procedures*
1980–81	237,983
1981–82	268,047
1982–83	237,725
1983–84	245,084
1984–85	242,192
1985–86	264,110
1986–87	290,350
1987–88	320,701

Source: Commonwealth Department of Community Services and Health unpublished

A recent report by the Working Party on Radiation Oncology to the Australian Health Minsters' Advisory Council (1989) noted a shortage of radiotherapy equipment in Australia and recommended a re–equipment program linked to a proper planning strategy to ensure the provision of comprehensive cancer services. The need for detailed studies comparing the effectiveness of radiotherapy with other approaches was identified.

6.4.8 Hearing aids

About 7 per cent of the total Australian population aged 15 years and over reported suffering some form of hearing problem in 1978 (ABS 4336.0). Of those, 20 per cent possessed a hearing aid.

The Hearing Services Program of the Commonwealth Department of Community Services and Health provides between 60 and 70 per cent of the hearing aids in Australia. In excess of 60,000 hearing aids are fitted each year under the Program (Table 6.8). The year to year variation in the number of hearing aids fitted in the main reflects the resources available.

Table 6.8: Hearing aids fitted(a), 1984–85 to 1988–89

(Number)

Year	*Hearing aids fitted*
1984–85	62,477
1985–86	74,892
1986–87	69,908
1987–88	67,519
1988–89	64,567

(a) Aids fitted by the hearing services program of the Commonwealth Department of Community Services and Health.

Source: Commonwealth Department of Community Services and Health 1989

6.4.9 Cochlear implants

A cochlear implant helps profoundly deaf people hear sounds. It consists of an externally worn, pocket–sized speech–processor, a head set and an implanted receiver/stimulator and electrode array. The headset picks up the speech signal which is encoded by the speech processor as a series of electrical pulses on the electrode array. The pulses stimulate the nerves in the cochlear structure of the ear. A device developed in Australia has become widely accepted overseas.

About 200 people received cochlear implants in Australia between 1982 and 1989, including 130 in the past three years. It is estimated that worldwide over 4,000 people have cochlear implants of all types.

In Australia the cost of a cochlear implant is $15,000 excluding rehabilitation costs.

6.5 Case studies

The following case studies give brief overviews of the characteristics, usage and potential of some major health technologies

6.5.1 Coronary angioplasty

Incidence of coronary angioplasty

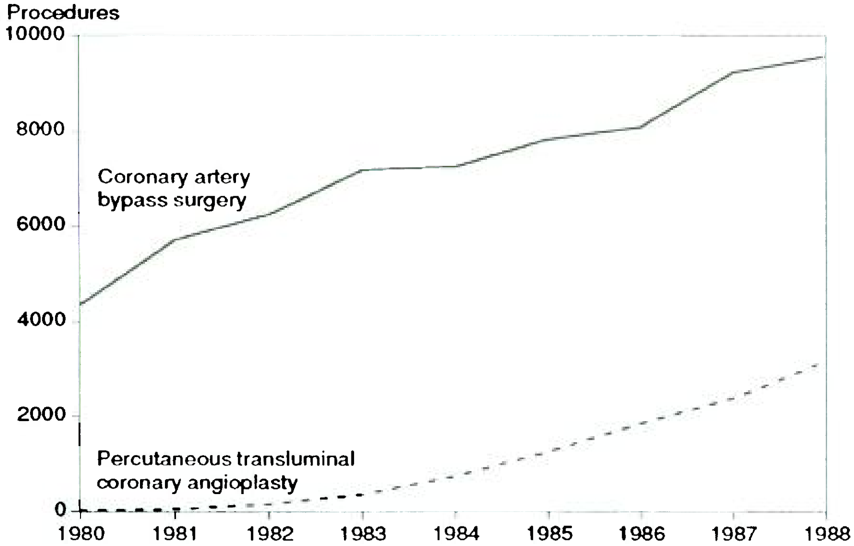
Percutaneous transluminal coronary angioplasty (PTCA) is a technique for relieving angina by dilating obstructions in coronary arteries. It is a less invasive treatment for coronary artery disease than bypass surgery.

Coronary angioplasty was introduced into Australia in 1980 and by 1988 more than 3,100 procedures a year were being performed at 19 institutions (National Heart Foundation 1990). For comparison, more than 9,500 bypass surgery operations were performed in 1988, at 24 institutions (National Heart Foundation 1990). The incidence of both procedures is growing rapidly (Figure 6.4).

Description of the procedure

In the PTCA procedure, a catheter with a balloon annealed to the tip is introduced through the skin into a major blood vessel and guided to the site of the blockage over a steerable guide wire. The balloon is inflated, disrupting the plaque forming the obstruction, enlarging the lumen of the artery and allowing increased blood flow to the heart.

Figure 6.4: Percutaneous transluminal coronary angioplasty and coronary bypass surgery, 1980 to 1988



Source: National Heart Foundation of Australia 1989; 1990

The procedure can be performed without general anesthesia, and only two to three days' hospitalisation are required. After leaving hospital, the patient can return to normal activities within one or two weeks. By contrast, bypass surgery is a major operation requiring general anesthesia and cardiopulmonary bypass. Eight to ten days of hospitalisation are required and it may be two to four months before the patient can resume normal lifestyle.

Indications

While PTCA and bypass surgery are both used to treat angina caused by coronary artery disease, they are not strictly alternatives. Each has a different range of indications, although these overlap substantially. Generally, PTCA is used to treat less severe disease. Bypass surgery is more appropriate for the treatment of severe multi–vessel disease and blockages in the left main artery.

Limitations

About 12 per cent of PTCA procedures are unsuccessful. Moreover, the coronary angioplasty procedure is not without risk, although the mortality rate is low (0.4 per cent in Australia compared with about 2 per cent for bypass surgery). About 2 per cent of PTCA patients in Australia require emergency bypass surgery, usually following abrupt closure of an artery (National Heart Foundation 1989; Rowe 1989).

Perhaps the most serious limitation of PTCA is that for about 30 per cent of patients arterial obstruction recurs within six months. For many of these patients, the procedure needs to be repeated (Rowe 1989).

Costs

The cost of a single PTCA procedure (including hospitalisation) has been estimated at about $7,100. This figure does not take into account the cost of complications, emergency operations and repeat procedures. If these are included, the average cost per patient becomes approximately $9,400. This represents the cost to health care. To determine the total cost to society, allowance must be made for time lost from work, support services, and costs to families. If average Australian weekly earnings are used as a basis for costing time lost from work, and allowance is made for the other social costs, the total cost to society would be around $10,500 per patient (NHTAP1989b).

For comparison, the cost to health care of coronary artery bypass surgery is about $11,700 per patient if complications and repeat procedures are taken into account. If allowance is made for time lost from work using average Australian weekly earnings as a basis, and for other social costs such as family support, the total social cost could be in the range $15,000–21,000 a patient. If allowance were made for those who never return to work after bypass surgery, the cost could be much higher (NHTAP 1989b).

Thus for those patients for whom the two procedures bring comparable benefits, PTCA has a significant cost advantage.

The costs of both procedures should be seen in the light of their benefits. For bypass surgery these include improved survival for patients with multivessel and left main artery disease. As yet there is no evidence that PTCA improves survival, but both procedures substantially reduce symptoms and improve quality of life.

For about 70 per cent of PTCA patients, the benefits will include reductions in the costs of medical treatment for angina. Over a 10–year period, these may range from $1,500 to more than $10,000 (NHTAP 1989b). However, these savings do not accrue primarily to the institutions carrying out the procedure, but to other agencies and the community generally.

Constraints on the growth of PTCA

The growth of PTCA is constrained by the requirements for highly skilled personnel and high cost facilities. PTCA is performed by cardiologists with special training in angioplasty, usually acquired overseas. Skill needs to be maintained by an adequate workload; coronary angioplasty cannot be performed on an occasional basis.

Coronary angioplasty should only be performed in a cardiac catheterisation laboratory with high quality imaging equipment. Facilities for emergency bypass surgery should be close at hand, with a surgical team on stand–by. Only major hospitals can adequately meet these requirements.

New developments

In the future, balloon angioplasty may be one of an armoury of techniques available to the cardiologist for the non–surgical treatment of coronary artery disease. New techniques include atherectomy, in which plaque is pared from the artery wall with a spinning blade or rotating burr attached to a catheter. Different types of intra-arterial stents are being tested as means of preventing reclosure of the artery, and several laser-based techniques for penetrating coronary artery occlusions are under development.

While these new technologies may extend the range of application of coronary angioplasty and reduce the incidence of restenosis, it is too early to assess their effectiveness or potential impact (Rowe 1989).

Conclusions

In spite of its limitations, PTCA has major advantages for patient welfare if it is applied appropriately. There is a danger of over-use, for example if the procedure is applied to patients whose angina is satisfactorily controlled by medication. However, at present there is also the possibility that it is under-used, particularly in the public sector, owing to funding constraints.

There is a need for the medical profession to adopt clear guidelines on the appropriate application of coronary angioplasty.

6.5.2 Magnetic resonance imaging

Magnetic resonance imaging (MRI) is a technology which marks a further step in the availability of powerful diagnostic imaging techniques. In some respects complementary to X-ray methods, MRI works on different physical principles and does not use potentially harmful ionising radiation. It provides high quality images of soft tissue and unique information to the diagnostician. Most widespread application has been in examination of the head and spine.

MRI has a high capital cost, associated in part with the need for a large (whole body), stable magnet and the computer installation required to assemble tomographic information.

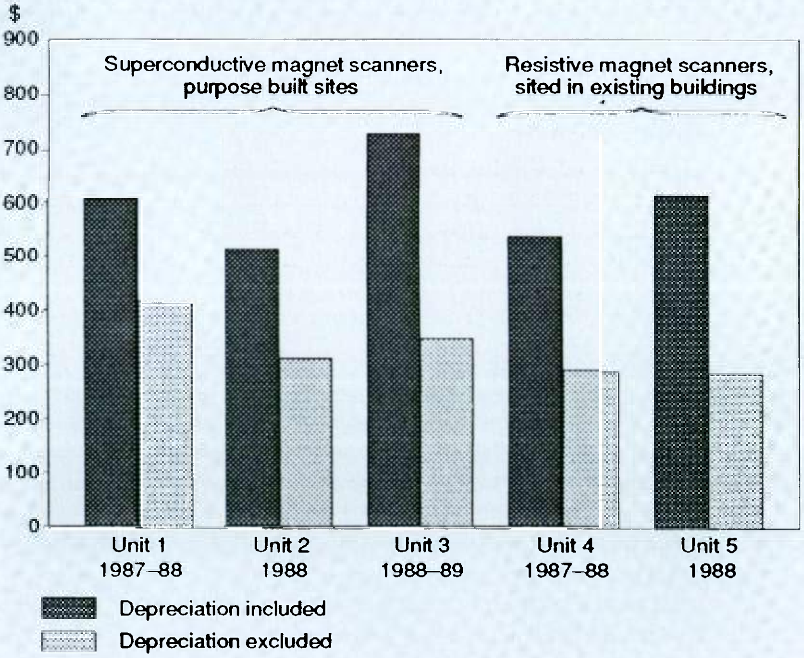
Recurrent costs are also significant. Superconductive magnets are used most commonly at present and require liquid helium to cool them to operating temperature. The major alternative is to use a resistive magnet which requires additional electrical power. Staffing costs, including the usual radiological and support personnel, are also substantial.

An Australian assessment of MRI has suggested that overall costs per examination, excluding interest charges, may be of the order of $500 to $600 in a public hospital setting (Figure 6.5) implying annual expenditure of up to $2 million for each unit (NHTAP 1989c).

Technical change is still rapid, and includes development of superconductive magnets which use less helium, lower cost units, some based on permanent magnets, and higher throughputs associated with better computer software.

The range of potential applications continues to grow with some emphasis, in part at the research stage, on cardiovascular imaging, including MRI of the moving heart.

Figure 6.5: Average cost per scan at MRI units (interest charges excluded)



Source: National Health Technology Advisory Panel 1990

Some of the attraction of MRI for clinicians is its ready ability to produce sagittal images (those in a plane dividing the body into right and left portions). This capability is achievable only with difficulty with earlier X-ray techniques. The generally excellent anatomical pictures achieved with MRI have appeal for both diagnosticians and those involved in patient treatment. However, the necessary link between excellence of image and quality of patient management and outcome is at best imperfectly established.

Strong evidence of benefits from MRI, in terms of its impact on patient management, outcome and health status is still limited. Reasons include the absence of controlled trials (Kent and Larson 1988), the 'intuitive' appeal of the images produced and more fundamental difficulties of designing and implementing studies of benefit which realistically reflect the true method of use of diagnostic technologies (McDonald 1989). In part, older and less expensive techniques may be as effective in the health care system, having regard to the inevitability of limited health care budgets, and established, accepted patterns of usage.

The Australian data on this health technology have helped to define its costs and range of useful applications (NHTAP1988c). Diagnostic yield in the teaching hospital environment has been shown to be high (Table 6.9).

Table 6.9: Diagnostic yield of MRI examinations, August 1986 to December 1988

(Per cent)

	MRI unit(a)			
Diagnosis	*1*	*2*	*3*	*4*
No abnormality detected	30	34	32	29
Abnormal finding	66	65	65	70
Equivocal finding	4	1	3	1
Total	**100**	**100**	**100**	**100**

(a) Based on MRI examinations of 12,406 patients at four hospitals.

Source: National Health Technology Advisory Panel 1989c

Issues to be resolved further are the relationship of such diagnostic performance to subsequent effect on patient health and quality of life (as compared with use of earlier methods) and the extent to which the diagnostic usefulness of MRI in a public hospital setting can be mirrored in any wider placement.

From the Australian MRI data, evidence is beginning to emerge of benefit through avoidance of additional tests and surgery, and better planning of procedures (Sorby 1989). Avoidance of sickness and disease associated with invasive diagnostic procedures, such as myelography, is a major benefit.

Early analysis suggests that in examination of some suspected conditions, such as syringomyelia and frontal lobe epilepsy, use of MRI may be cheaper or no more expensive than alternative diagnostic procedures, having regard to additional related costs such as those associated with overnight hospital care (Crowe and Hailey 1989). Such cost advantage or equivalence would not apply should the MRI examination be conducted in addition to other methods. Nor would such advantages necessarily be realised in less clear-cut situations where MRI provides no compelling technical advantage and earlier, more widely distributed and less costly alternatives can provide acceptable diagnostic data for patient management.

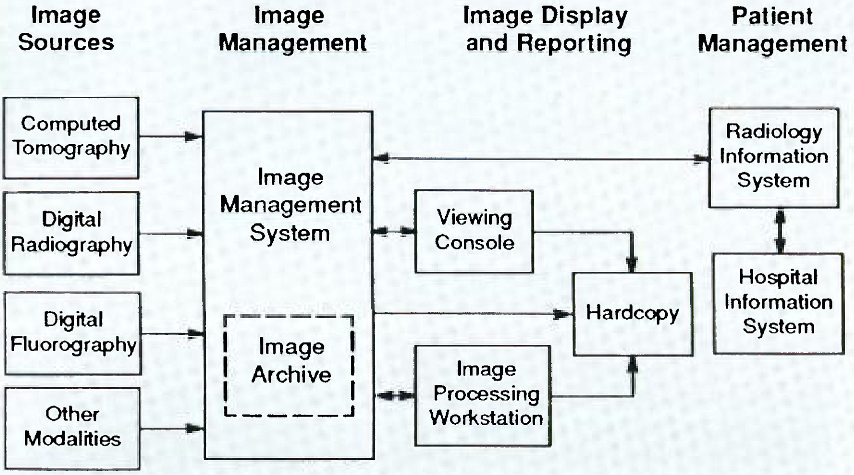
The Australian experience suggests that MRI facilities should be available to major neurosurgical centres (McDonald 1989). The types of machine to be acquired, their placement, numbers and range of application are matters which will require further appraisal.

6.5.3 Digital radiography

Computer technology is having a significant impact on hospital information systems. The digital image approach is being applied in radiology and organ imaging departments. The technology enables the electronic capture of information from equipment such as X-ray scanners, and presentation of images and other data on a visual display unit (Figure 6.6).

Development of this approach has led to discussion of concepts such as the 'filmless hospital'. The extent of research and investment being made in this area by major corporations suggests that a great variety of systems will be available for purchase by hospitals.

Figure 6.6: Digital radiography system



Source: Nosil et al 1988

Costs and benefits of digital radiography systems

The development and availability of this new technology has several implications. As with much computer technology, there is the expectation that large capital investment will be involved. Whereas the cost of establishing a conventional radiology department for a typical 400 bed hospital would be of the order of $9 million, the cost of a radiology department based entirely on digital radiography techniques might be of the order of $16 million. The additional capital would be for signal conversion units (AC to DC), computer networks, optical storage archives and visual display monitors to allow radiologists to perform image interpretation. However, a digital radiography system could eliminate the need for film dispensers, processors, cassettes, multi-viewers and light boxes and the on-going costs associated with film processing and handling.

Restructuring of the existing administrative arrangements would be required with consequent dislocation of hospital staff and procedures. A new team of professionals would be needed to operate the digital radiography systems. Specialists required include systems analysts, physicists, engineers, computer programmers and communication experts. Such staff cannot be recruited from the existing clerical staff, such as film room filing clerks and administrative assistants, who may be displaced by digital technology. There are significant recruitment and career structure matters to be considered in the introduction of digital radiography systems.

The stated benefits of digital imaging systems need to be considered against the costs. Benefits such as ensuring the integrity of patient records, (as all images are stored on optical disc), represent an improvement over existing systems where 10 per cent or more of patient films may be 'lost' or not available for review when required. A major benefit is seen to be the reduction of patient exposure to radiation. Digital radiography systems tend to use less radiation than technologies which depend on use of film. The digital systems also have the capacity to reduce the need for re–takes as the digital image, once obtained, can subsequently be enhanced or modified. There is also the possibility that the ability to enhance digital images may provide more diagnostic information to the examining radiologist.

Of particular importance is the potential benefit of faster turnaround and reporting of diagnostic tests using digital radiography techniques. If, for example, it becomes possible for radiologists to report images from the visual work station then the delays associated with the production of films and reports will tend to disappear. Images could be reported in real time from visual displays and stored on optical disc with reports and the images available on–line for physicians and specialists. Such developments open up the possibility of new ways of conducting patient investigations and may allow some existing investigations to be eliminated with savings in costs and reduced patient inconvenience.

This scenario assumes that radiologists are prepared to conduct the primary image interpretation task from visual display screens rather than from film. There have been reservations expressed about the adequacy of resolution of screen images when compared with the information available on X–ray film. This debate seems likely to continue for some time and will be influenced by technical developments as higher resolution viewing screens become available. However, many images such as those from computed tomography are already digitally produced and this trend is likely to increase.

Major issues for hospitals considering this technology are the investment of a large capital sums at a time when the technology is undergoing rapid change, the possible need to make a commitment to one supplier to ensure integration of the complex systems, and substantial uncertainty regarding the consequent changes to work practices and hospital infrastructure.

Summary

The arrival of digital radiology systems provides an opportunity for the restructuring of diagnostic procedures within hospitals. Introduction of these systems will imply a major planning and administrative task for the institutions and health authorities concerned. There is a need for a realistic assessment of the costs and benefits of digital radiography systems in hospitals based on practical experience in Australia.

Such matters as the possible problems with the hospital being committed to one particular manufacturer of equipment and being unable to accept images from other manufacturers' equipment need to be addressed. However, such difficulties are likely to be outweighed in the longer term by the benefits offered by the new technology in terms of better diagnosis and patient management.

6.5.4 In–vitro fertilisation and other assisted conception

There are no reliable estimates of the prevalence of infertility in Australia. Studies in other countries suggest that 10 to 15 per cent of couples will experience either permanent or transient infertility during their reproductive lives.

In-vitro fertilisation (IVF) and the related procedure of gamete intrafallopian transfer (GIFT), in which eggs and sperm are put directly into the fallopian tubes, are now used to treat infertility that is not responsive to other forms of treatment. The main causes of infertility treated by IVF and GIFT are blocked fallopian tubes, failure of ovulation, endometriosis, and male causes because of low sperm counts or other abnormalities. Multiple causes are not uncommon and there is also a sizeable group in which infertility is unexplained.

In collaboration with the Fertility Society of Australia and individual units that provide clinical services to treat infertility, the National Perinatal Statistics Unit has developed a national register of pregnancies resulting from IVF and GIFT. The register was established in 1983 but data for the period since IVF began in 1979 have also been obtained. All units in Australia and New Zealand contribute data to the register. In 1988, there were 21 units in Australia of which all but two had facilities for both IVF and GIFT.

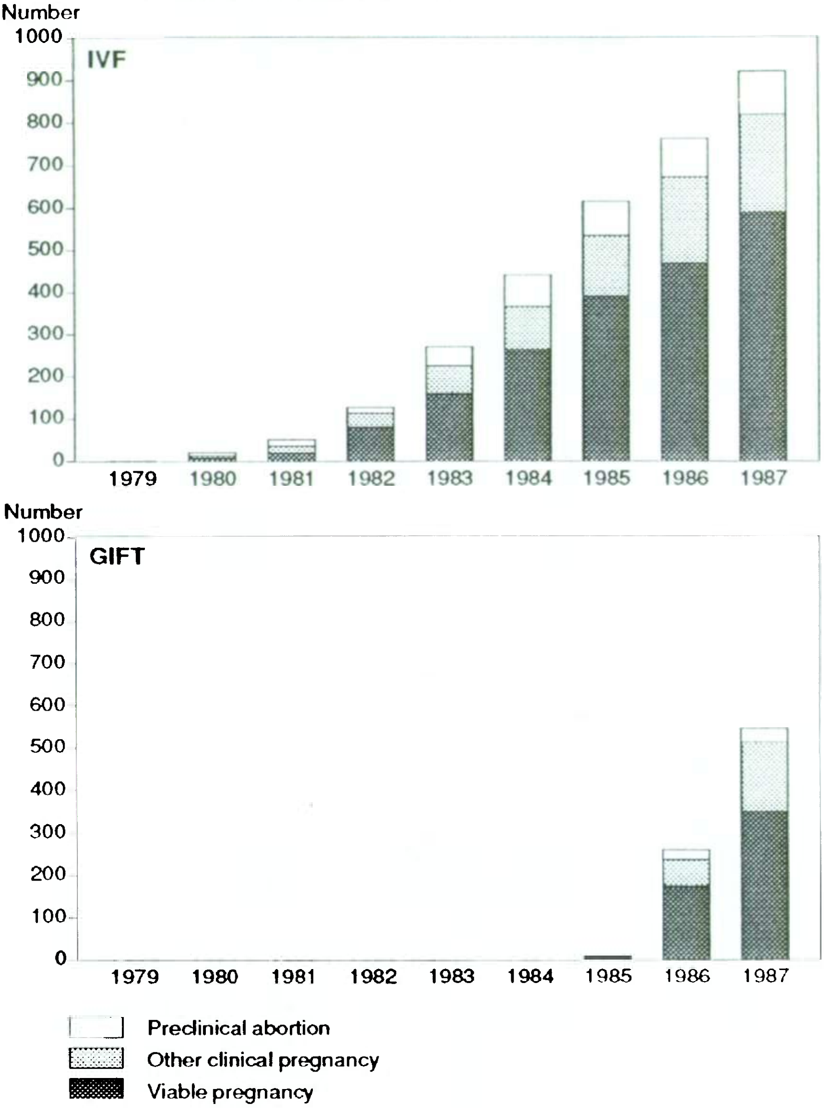
The initial purpose of the register was to monitor trends in pregnancy outcome, especially the incidence of congenital malformations. More recently, data on pregnancy rates and laboratory procedures have been obtained. Annual reports are based on pregnancies that result from fertilisation in a particular year.

In 1987, more than 5,000 women had one or more cycles of treatment by IVF or GIFT. There were 7,733 IVF cycles commenced and 1,954 GIFT cycles. The resultant pregnancy rates can be expressed in numerous ways but the main indicator used is the number of pregnancies resulting in a live birth, expressed per one hundred cycles that reach the stage of egg collection. The live-birth pregnancy rates for GIFT were higher than for IVF—17.4 per hundred cycles for GIFT and 9.5 for IVF. Pregnancy rates so calculated varied markedly among the different units.

About 1 in 200 births in Australia now result from these new reproductive technologies. The increasing trend in pregnancies after IVF and GIFT is apparent in Figure 6.7, which shows the numbers of viable pregnancies of at least 20 weeks' gestation, other clinical pregnancies such as spontaneous abortions and ectopic pregnancies, and preclinical abortions (in which there is only biochemical evidence of pregnancy).

Up to September 1988, a total of 3,215 births had been notified to the register, of which about 80 per cent had occurred after IVF. Ectopic pregnancies and spontaneous abortions are more common in IVF and GIFT pregnancies than after natural conception, both because of age and other characteristics of the previously infertile women. Women aged 35 years and over are less likely to achieve viable pregnancies than women in younger age groups (Figure 6.8).

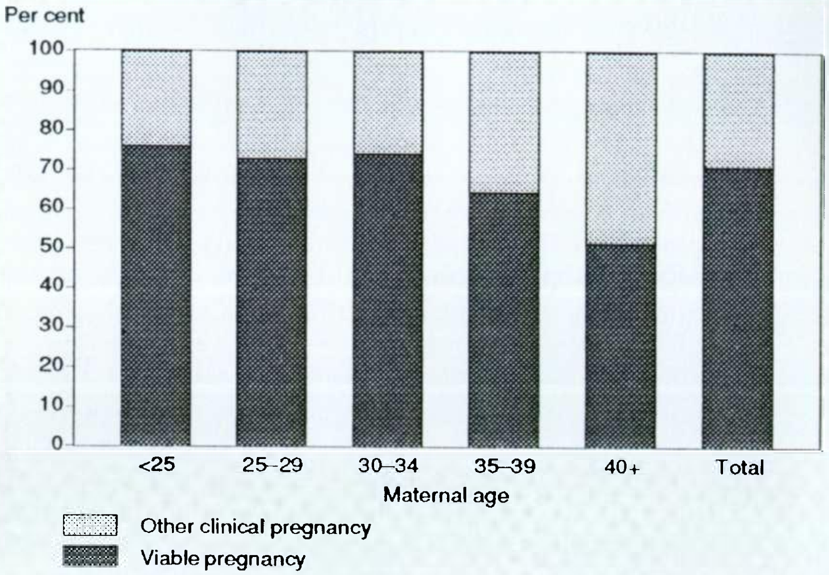
Figure 6.7: Outcome of in-vitro fertilisation and gamete intrafallopian transfer pregnancies by year of fertilisation, 1979 to 1987



Source: National Perinatal Statistics Unit unpublished

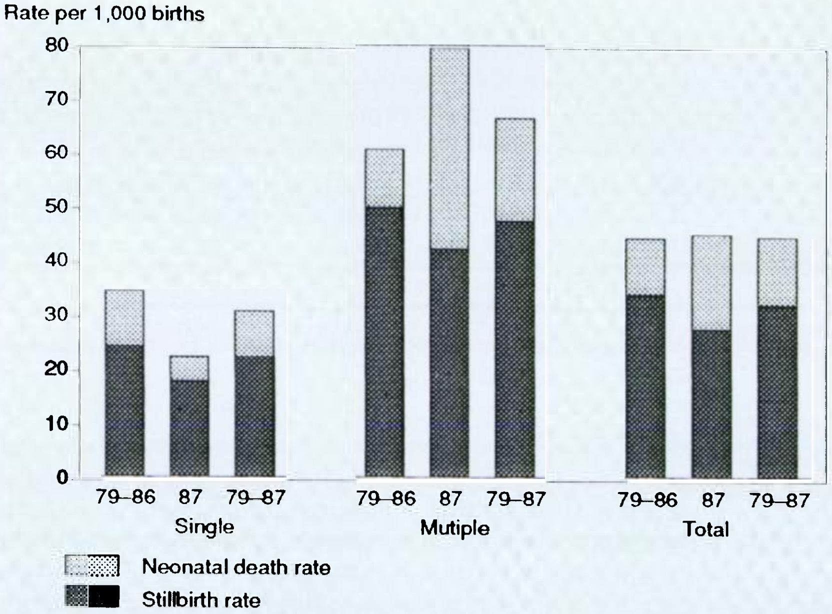
Perinatal mortality rates after IVF and GIFT are more than three times those for the Australian population. Multiple births associated with transfer of more than one embryo or oocyte, and the underlying causes of infertility, are some of the reasons for the higher rates. Stillbirth rates are much higher than neonatal death rates for both single and multiple IVF births (Figure 6.9). The population-based register in Australia has an important function in evaluating efforts to improve pregnancy rates and reduce adverse outcomes in IVF and GIFT pregnancies.

Figure 6.8: Outcome of in-vitro fertilisation clinical pregnancies during the period 1979 to 1987 by maternal age



Source: National Perinatal Statistics Unit and Fertility Society of Australia 1990

Figure 6.9: Perinatal mortality in single and multiple IVF births, 1979 to 1987



Source: National Perinatal Statistics Unit unpublished

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7 Health: the quality of survival in older age

Guest editor: John McCallum*

It is now a commonplace observation that Australia's population, like that of all other developed countries, is ageing. A similar phenomenon will be observed in many developing countries in the next century.

In 1990, 15 per cent of Australia's population was aged 60 years and over compared with about 17 per cent in Japan and the United States, 20 per cent in the United Kingdom and 23 per cent in Sweden. By contrast, the proportion aged 60 years and over in China was 9 per cent and in Indonesia it was 6 per cent (Figure 7.1).

In terms of the relative size of the aged population, Australia falls below the proportions in most developed countries and above the levels of the developing countries of the Asia Pacific region.

In speed of population ageing, Japan leads the developed countries. Some developing nations are also ageing very rapidly, while the Australian rate is moderate. Japan is expected to take 25 years to move from 10 to 20 per cent of its population aged 65 years and over, compared with 21 years in Singapore, 68 years in Sweden and 86 years in the United Kingdom (Chen and Jones 1989). The same process will take 45 years in Australia—faster than for older European populations but slower than for the rapidly developing countries of the Asia Pacific region. According to the most recent ABS projections (ABS 3222.0) the proportion of Australians aged 65 years and over will increase from 10 per cent in 1986 to between 19 per cent and 22 per cent in 2031.

Australia, because of moderate and slower ageing processes has advantages in adjustment, including the opportunity to learn from other developed countries about effective policies for ageing populations. However, there is a corresponding responsibility to communicate experiences, with rigorous evaluations, to the rapidly developing countries of the region.

In the past, disease in older age was accepted as inevitable. However, over the past 100 years, life expectancy has increased, particularly at birth, and the impact of infectious diseases has declined, leading to ageing of populations.

The progress of modern medicine leads to an expectation that through ever increasing medical research expenditure, ever improving population health is realistic and achievable. Improvements in population health result from complex interactions of economic, educational and public health measures with medical advances—although the contribution of medical interventions is controversial (Sagan 1987). What the public regards as priority health issues may not be the focus of medical research.

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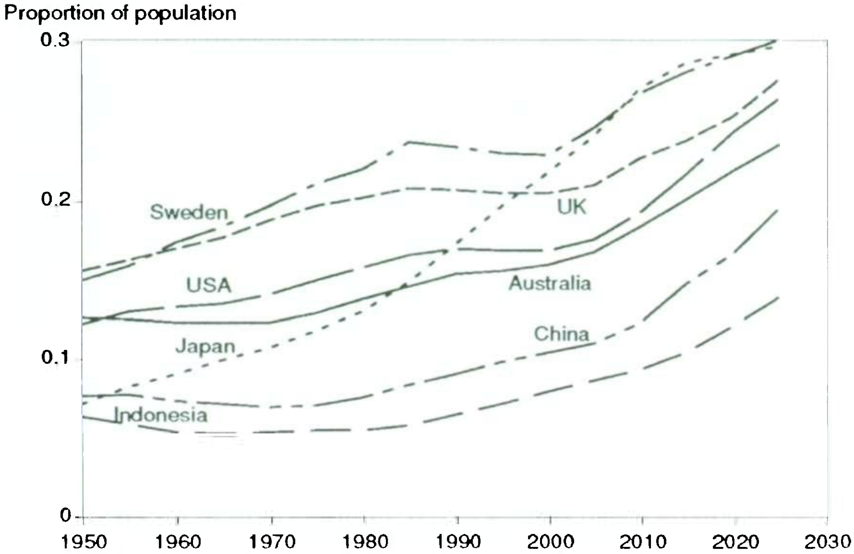
Figure 7.1: Proportion of population aged 60 or more, selected countries, 1950 to 2025



Note: Estimates 1950 to 1985, projections (medium fertility variant) 1990 to 2025.

Source: United Nations 1989

This chapter will examine achievements in the quality of life for older people provided by improvements in longevity and recent technological advances in medicine.

The agenda of modernised medicine can also be criticised for failing to evaluate the cost–benefit ratios related to its achievements, and to deal with the persistent realities of loss of function and social isolation that continue to occur in older age. On the other hand, ageing is not entirely negative nor is it necessarily a crisis for health and welfare programs. The complexities of health and ageing will be discussed to avoid overly simplistic positive and negative views.

It has been suggested that health quality at older ages is more appropriately assessed in a variety of terms, such as quality of life, level of function, ability to perform normal activities of daily living, level of dependency on others and psychosocial well-being rather than in terms of simply prolonging life. The public and private cost of providing services to achieve social goals such as maintaining the frail aged independently at home or providing long–term nursing home care to the most dependent, has to be considered alongside the quality of life gained. The question: 'Is a marginal extension in years of life in older age justified in terms of the public and private cost for the gain in quality of life, in active or independent years?' is a critical one for older people. Death is inevitable and mostly accepted at older ages. Moreover, for older people even the presence of disease may not be a cause of great concern. Consequently, recent discussions are framed in terms of 'successful' ageing and maintaining a 'satisfactory' lifespan (Callahan 1987).

Health in older age is very dependent on the social and environmental context. The quality of housing, for example, is critical in maintaining daily activities. Income is important for adequate nutrition and allows options for transport and leisure that can prevent social isolation. The 'new public health' stresses that these social and institutional structures are important in health outcomes but they have added importance in older age because of increasing risk of dependency. An extra dollar spent on social and economic fabric, such as housing or pensions, may well have more impact on health outcomes for older people than a dollar spent on hospitals, doctors and nursing homes.

7.1 The changing social and economic fabric

7.1.1 The Australian population

Birth and death rates (which are strongly related to health improvements) and immigration level changes all play a part in shaping age groups in the Australian population.

The low birth rate in the 1930s is now contributing to a smaller cohort of the 'young old' (those in the 60s), which will be expressed in lower levels of demand for health and other services used by this age group in the 1990s. However, this also heightens the impact of the extension of life for the 'old old' (those 80 years and over) who are increasing in both number and proportion relative to the older age group generally.

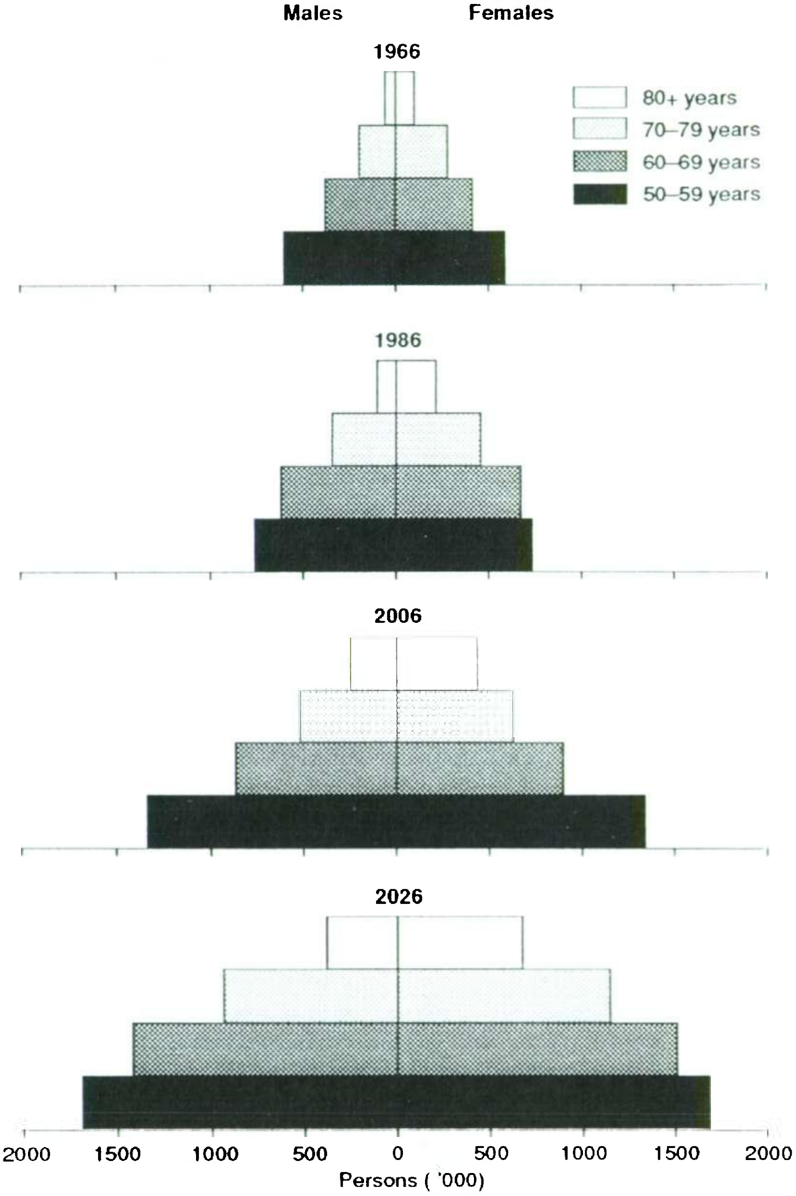
The post World War II baby boom is reflected in the sharp increase in the number of people aged 50–59 years expected in 2006, and in the large flows expected to enter the 60–69 and 70–79 year age groups in 2026 (Figure 7.2).

The baby boom cohorts were boosted by relatively high rates of immigration of young adults after World War II, and by the improved survival at older ages that began to occur from the 1970s. As a result, between 1986 and 2026 the number of people aged 60–69 years is expected to increase by 127 per cent—from 1.3 million to 3 million, representing an average annual increase of 2.1 per cent.

While the ageing of the baby boomers after 2010 is dramatic and highlights the need for future planning, another process, the growth of the 'old old' group, is also important. Between 1986 and 2006 the number of people aged 70–79 and 80 years and over is expected to increase rapidly in absolute and in relative terms. Over the 20 years the number of people aged 80 years and over is expected to increase by 117 per cent—from 314,300 to 683,400, representing an average annual increase of 4.0 per cent. This is expected to increase the numbers needing services and facilities for support in older age. By contrast, the ageing of the baby boomers after 2010 is expected to produce more pressure on pensions, housing and leisure facilities than upon institutional care and community services.

Population ageing occurs in the context of more general population growth. At no time in the next century before 2026 will the relative numbers of children and older people compared with the working age population (one type of dependency ratio) exceed the ratio in 1961 when the number of children relative to the working age population

Figure 7.2: Persons aged 50 or more, 1966 and 1986, and projections 2006 and 2026



Source: Australian Bureau of Statistics 3222.0

was high but the number of older people relatively low. Further, even with low net migration of 50,000 a year, the proportion of the working population aged 15–64 years is expected to remain above the 1981 level until 2021 and above the 1961 level until 2046 (Young 1990).

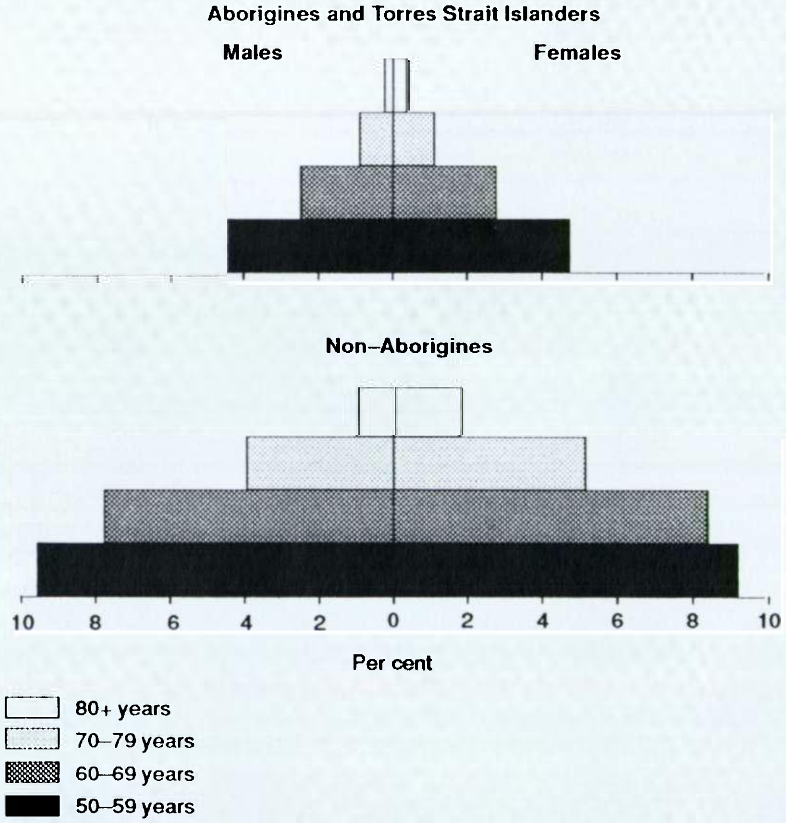
While clearly there is no 'crisis' in current ageing, the increased numbers of older people, seen clearly in the increasing size of the aged population at each 20–year step from 1966 to 2026, will mean that more beds for older people will be needed in health care institutions and more people, both in families and in the service labourforce, will be needed to care for older people. It means increased numbers of older women relative to men because of their greater longevity, but worse morbidity, with corresponding concern about the appropriateness of services for older women.

7.1.2 Aborigines and Torres Strait Islanders

Aborigines and Torres Strait Islanders have not shared in the increased longevity of the Australian population (Section 2.7.1). In 1986, only 4 per cent of the Aboriginal and Torres Strait Islander population was aged 60 years and over, compared with 15 per cent of the non–Aboriginal population (Figure 7.3).

The proportion of the Aboriginal and Torres Strait Islander population 60 years and over is comparable with that of less developed countries, such as Bangladesh, but the causes of death and age–specific rates are quite different.

Figure 7.3: Distribution of older people, Aborigines and Torres Strait Islanders and the non–Aboriginal population, 1986



Source: Australian Bureau of Statistics 1986 Census

For Aborigines and Torres Strait Islanders, disease of the circulatory system (particularly ischemic heart disease and cerebrovascular disease) is the leading cause of death, with the infectious diseases and their sequelae, common causes of death in less developed countries, becoming increasingly less frequent causes of death.

The most striking feature of the age specific pattern of mortality for Aborigines and Torres Strait Islanders is the very high death rates among young and middle aged adults, high even compared with less developed countries.

For older Aborigines and Torres Strait Islanders, death and hospitalisation rates generally are much closer to those of the total Australian population. Section 2.7.1 provides more detail of the health status of Aborigines and Torres Strait Islanders.

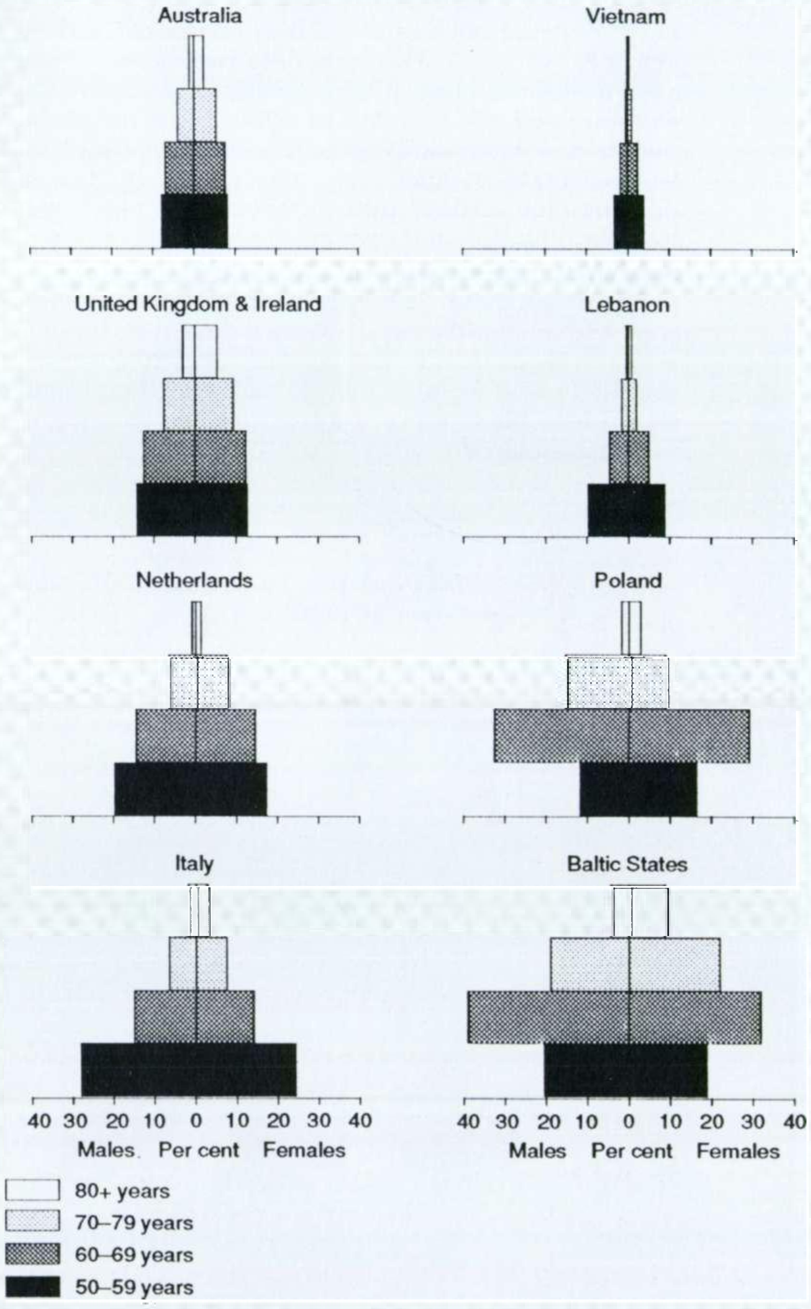
7.1.3 Migration and ethnicity

The mosaic of ethnicity and cultures among Australia's older population was considerably enriched by high post–World War II immigration. The ageing of the first generations of various birthplace groups varies by patterns of recency of arrival in Australia and the continuity in the immigration of any one group.

For Southern European birthplaces, notably Greece and Italy, there is an advantage in longevity over most other birthplaces, including Australia (McCallum 1990). In 1986, 3 per cent of Vietnamese in Australia were aged 60 years and over, compared with 9 per cent of Turks, 12 per cent of people from Yugoslavia and 24 per cent of Italians (Figure 7.4).

Looking at age structures within particular groups, migrants from Italy and the Netherlands arrived in large numbers in the 1950s but then reduced to a mere trickle. Consequently 7 per cent of Australian residents born in Italy and the Netherlands are aged 70–79 years, compared with 5 per cent of Australian–born. Some 8 per cent of United Kingdom born migrants are in the same age group because of similar fluctuations in their arrival rates. The proportions of people born in Poland and the Baltic States (Estonia, Latvia and Lithuania) aged 70–79 are more extreme at 12 per cent and 20 per cent respectively. There are highly atypical sex ratios (number of males per 100 females) for Polish–born people aged 70–79 at 192 compared with 71 for Australian–born, indicating large imbalances of men over women, because of migration of male Polish refugees after World War II. At the other end of the scale are those born in Lebanon and Vietnam who have proportions of people aged 70–79 years less than 2 per cent and 1 per cent respectively. About a quarter of all Australian residents aged 45–64 do not speak English well and the proportion increases to about a third of people aged 70 years and over. Older people in Australia are increasingly likely to be non–English speaking and to have divergent cultural practices and beliefs from mainstream Australians.

Figure 7.4: Distribution of Australia's older people by selected birthplace, 1986



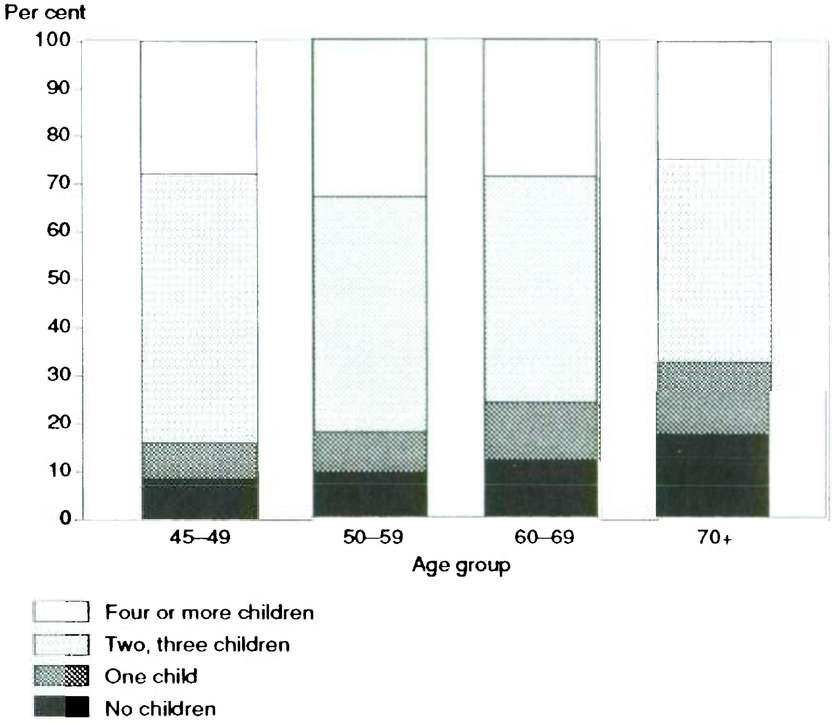
Source: Australian Bureau of Statistics 1986 Census

7.1.4 Women and families

It is important to note that for surviving women in 1986, younger women were more likely to have had any children than older women (Figure 7.5). Twice the number of women aged 70 years and over (17 per cent) had borne no children compared with women aged 45–49 years (9 per cent). Similarly only two-thirds of women 70 years and over had borne two or more children compared with 84 per cent of women aged 45–49 years in 1986. Thus future generations of older people are more likely to have surviving children who are potential 'supporters' in older age. This is partly because of the higher proportions of never married women at older ages—10 per cent for women 80 years and over compared with only 4 per cent for women aged 50–59 years (Figure 7.6).

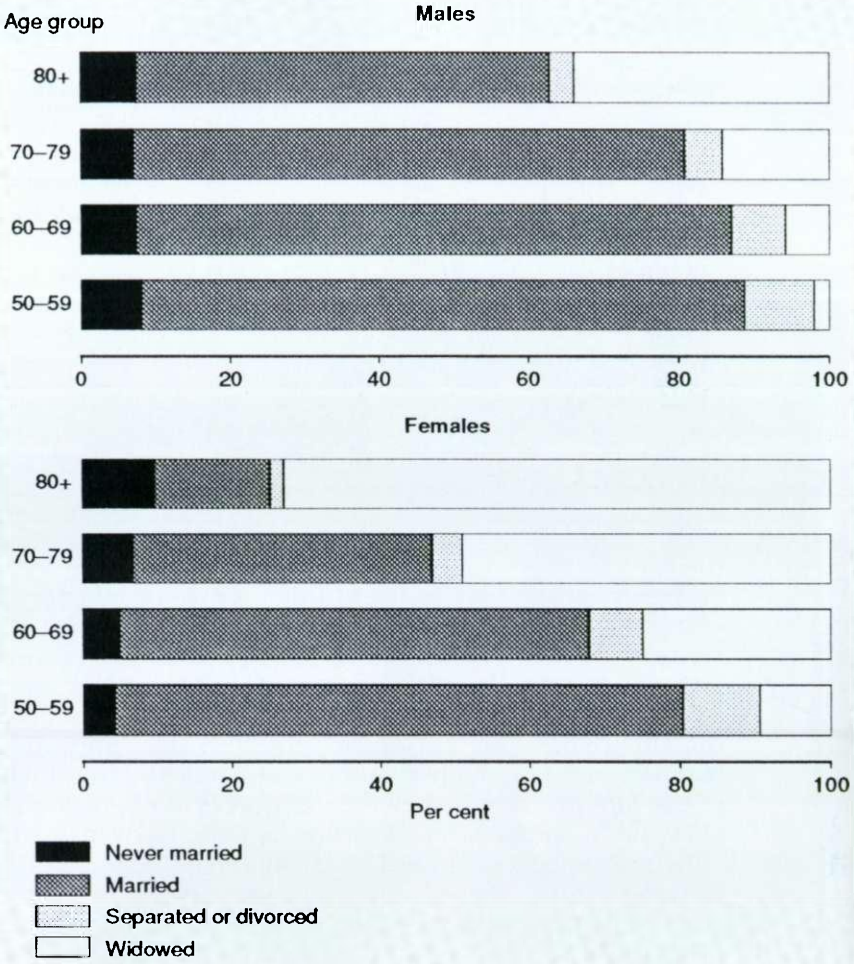
The other major issue for women is the rapidly increasing rate of widowhood in older age. It rises from a quarter of women aged 60–69 years to three quarters of women aged 80 years and over. While men are likely to have a spouse to care for them in later life, women are much less likely at very advanced age to have the same access to informal support.

Figure 7.5: Distribution of children everborn, women 45 years and over in 1986



Source: Australian Bureau of Statistics 1986 census

Figure 7.6: Marital status distribution within age group, 50 years and over, 1986



Source: Australian Bureau of Statistics 1986 Census

7.1.5 Women and work

The role of adult children, in particular daughters, in support of elderly parents cannot be assumed from the potential availability of children. Women have been through a major restructuring of their middle years with declining numbers of children born to them and increasing access to education and paid work. In 1986, 85 per cent of women aged 65 years and over held no post-school qualifications, and less than 1 per cent had tertiary degrees. For women aged 50–54, 60 per cent had no post-school qualifications and 2.5 per cent had tertiary degrees. Women are increasingly less likely to work at ages 10–19 years because they are in education, but they are more likely to work after age 20 years (Santow 1989) (Table 7.1). In 1986, women aged 20–29 years (born 1957–1966) spent 70 per cent of their time

Table 7.1: Proportion of time in full-time employment at a given age, by 10-year cohorts, females, 1986

(Per cent)

	Cohorts (age at 1 July 1986)			
At age group	*20–29*	*30–39*	*40–49*	*50–59*
10–14	(a)0.3	(b)1.3	3.5	3.6
15–19	43.4	54.1	63.2	69.2
20–24	68.5	62.5	60.7	53.4
25–29	53.9	49.1	42.2	30.7
30–34		45.5	44.9	33.3
35–39		52.0	56.3	41.8
40–44			62.5	52.7
45–49			60.2	52.0
50–54				41.4
55–59				26.0

(a) Numerator < 10.0 person-years of exposure.

(b) Numerator < 50.0 person-years of exposure.

Source: Santow 1989

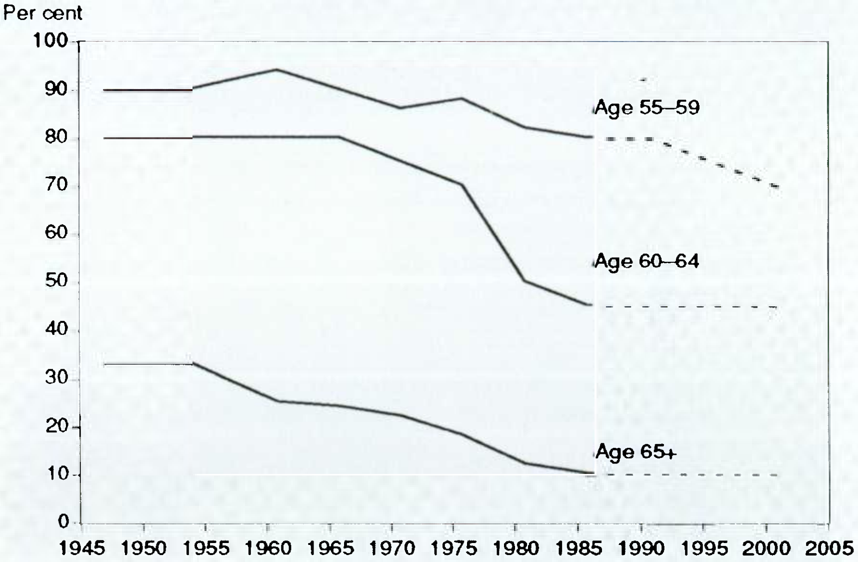
between ages 20–24 years in full-time work compared with 50 per cent for women aged 50–59 years (born 1927–1936). These changes are quite consistent across age groups and are more pronounced for married women than for single and never married women.

Middle-aged Australian women are likely to be caught between the responsibilities for caring for children and parents and between traditional family responsibilities and a desire to fulfil their potential in the labourforce. If they are daughters of migrant parents they are also likely to have to negotiate between parents with traditional cultural expectations and 'Australianised' children (McCallum and Gelfand 1990). These baby boom women will be very different from current generations of older women when they themselves reach older age next century. In broad terms they will be more like current generations of men in retiring from work and more likely to receive superannuation payments in their own right.

7.1.6 Men and work

Men have experienced major changes in their lives at older ages. Participation in work has declined rapidly for men aged 50 years and over, but particularly at ages 60–64 (Figure 7.7). These declines are expected to continue while women's participation is increasing, particularly at younger ages. A new phase of active leisure associated with increasing expectations of quality of later life has emerged for men. While many older people desire leisure there are increasing pressures for opportunities to continue to use their skills in the labourforce. South Australia, New South Wales and Western Australia are changing anti-discrimination legislation to include 'age' and to prevent compulsory retirement. Other States are considering changes.

Figure 7.7: Labourforce participation, men 55 years and over, 1947 to 2001



Source: Australian Bureau of Statistics 1986 Census
Department of Employment, Education and Training projections unpublished

7.1.7 Leisure activity

Decreasing participation in work by men would be less a concern if there was a parallel increase in active leisure. Between ABS surveys of time use in 1974 and 1987 the time spent by older men in domestic tasks increased, paralleling the decreasing time spent at work. However, the pattern is that as Australians age their participation in social activity declines and from age 50 their home leisure activities (eg watching television) increases (Table 7.2). Older people report 'health' as a reason for not undertaking new activities more frequently from age 50 years. They are also less likely to report that they have activities they would like to do but are unable to. An increasing fear of crime and decreasing average income compared with people at younger ages, suggests that there is a 'syndrome' of underuse revealed by these patterns of attitudes and activity in older age (McCallum 1989). More activity would be possible and desirable but appears to be prevented by the social and economic constraints experienced disproportionately by older people. This has implications for health outcomes because level of activity is one of the few common risk factors for a number of diseases, and is important for psychological well-being.

Table 7.2: Activity rates, reasons for not doing new activities and dissatisfaction index, by age group, 1985 and 1986 combined

	Age group						
	14–29	*30–39*	*40–49*	*50–59*	*60–64*	*65–69*	*70+*
Activity rates				*(Mean weekly time in minutes)*			
Home leisure	2,282	2,043	1,893	2,107	2,378	2,319	2,376
Social activities	766	581	461	450	462	403	346
Outdoor activities	226	184	159	131	163	139	105
Sport and recreation	183	156	147	156	191	176	185
				(Per cent)			
Reasons for not doing new activities(a)							
Expense, cost	9.5	7.4	6.4	4.3	3.1	6.1	2.7
Transport problems	2.9	1.3	0.9	2.0	3.5	3.4	2.7
Facilities not available	13.6	8.4	6.4	7.9	7.5	5.4	8.2
Health	5.3	6.2	6.0	11.8	21.7	32.7	38.8
No time, too busy	38.1	49.1	50.9	43.2	31.9	20.4	14.6
Dissatisfaction index(b)	57	56	52	41	36	27	27

(a) Each respondent could offer a maximum of four reasons. The most frequent was used here.

(b) Proportion having at least one unsatisfied activity.

Source: Commonwealth Department of Sport, Recreation and Tourism (1987)

7.1.8 Geographic distribution, housing and income

Ageing occurs not only in a social context but also in a geographical and environmental context. The proportion of people aged 60 years and over varies between the States and Territories. In South Australia 15 per cent of men and 18 per cent of women are aged 60 years and over, compared with 13 per cent of men and 17 per cent of women in New South Wales and Victoria respectively. The Australian Capital Territory and the Northern Territory have the lowest proportions of older people, with about 7 per cent of men and 9 per cent of women in the Australian Capital Territory aged 60 years and over in 1986.

Housing is crucial to the quality of life of older people. The type and standard of housing affects independence, health, feelings of well–being and security. Housing can also induce poverty, cause distress and ill–health and adversely affect life cycle changes. In recent decades there has been public and private sector recognition of the significance of housing for older people.

Taxation incentives from the 1950s led to a rapid increase in the rate of home ownership, from which present cohorts of older people are now benefiting. About three–quarters of older Australians were living in their own homes on the night of the 1986 Census.

The 1950s also saw the introduction of public sector housing specifically for older people, usually in the form of bed–sitters and high-rise accommodation. The inadequacy of this type of housing was recognised in the 1970s and one and two bedroom unit-type accommodation was introduced by public housing authorities. The private sector responded to increasing demand for age-specific housing design with the introduction of retirement villages and other types of retirement lifestyle developments in the 1980s.

The high rate of home ownership, and the relative availability of public housing for older people, has enabled the Australian commitment to a minimum flat-rate age pension to be sustainable.

Present policies are establishing a retirement incomes system based on the dual provision of means tested public pension support, funded from general revenues, and private superannuation through public support and personal savings. This reflects Australian social values and expectations and is planned to meet income needs of future cohorts of older people.

The full-rate single age pension is equivalent to 25 per cent of the average weekly income for an adult worker. Currently 78 per cent of older people are reliant on full or part-rate pensions for their income needs, with 85 per cent of all pensioners receiving supplementary assistance through pharmaceutical and other concessions occurring through the pensioner health benefit card, provided to older people receiving less than an indexed level of total income.

Superannuation schemes been increasing their covereage steadily since the 1970s. Coverage rose from 30 per cent of all employed people aged 15–74 in 1974, to 40 per cent in 1984 and 50 per cent in 1988. The ABS estimated that more than 3.5 million full-time and 250,000 part-time workers were covered by superannuation schemes to November 1988 (ABS 6319.0).

The changing social and economic fabric of Australian society sets the context for the discussion of the health of older people. Given the reality of disease and death in older age, social and economic factors are as important as medical interventions in maintaining well-being among older people. The number of older people is a major factor which interacts with historical forces in the life careers of women and of older men. The moderate rates of ageing in Australia imply the interaction of ageing with social and economic changes will be just as important as the ageing of the population itself in determining policies for an ageing society.

7.2 The health status of older Australians

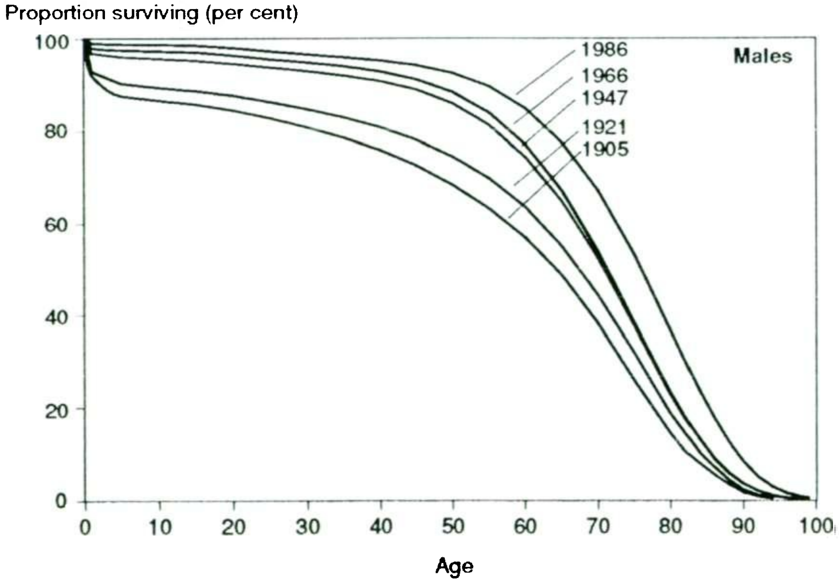
7.2.1 Survival

Underlying the increased numbers of older Australians are improvements in health and survival in the 20th century. The survival curve (Box 7.1) reflects developments in the social and economic context outlined in the previous section. From 1905 to 1966 the improvements in survival were among people aged 60 years and under, whereas between 1966 and 1986 the survival rates for both men and women improved significantly at older ages also (Figure 7.8).

The shift between 1921 and 1966 might be described as a rectangularisation of mortality (Chapter 2) because the curve moved out but with an apparently fixed upper limit to life. However, the shift between 1966 and 1986 cannot be so described. There was a roughly uniform shift in the probability of survival between ages 60 and 90 of about 10 percentage points for any specific age. About 50 per cent of men survived to age 76 years and 50 per cent of women survived to 85 years in 1986. After age 60 years there was at least a 10 per cent difference in the proportions of men and women surviving to old age.

In the past 20 years, the probability of survival at older ages, particularly between 60 and 85 years, has increased substantially. The apparent upper limit to lifespan has increased from about 85 years (Fries 1980) to over 90 years. For the first time, significant increases in life expectancy are being seen at older ages as well as at birth. This substantial shift in survival at older ages is historically unparalleled and the effects on the lives of older people are yet to be studied. It may partly reflect arrival in older age of 'healthy' groups of migrants, such as Greeks and Italians (Section 7.1.3).

Figure 7.8: Survival curves for males, 1905, 1921, 1947, 1966 and 1986



Source: Australian Bureau of Statistics 3101.0, 3302.0

Box 7.1: Survival Curves

The survival curves in Figure 7.8 show the probability of survival to any given age (represented by the horizontal axis of the graph) using survival probability estimates from Australian life tables (ABS 3302.0, 3101.0).

These curves show the proportion of a cohort which would survive to each age if it continued to be subject to current mortality levels at each age of life. For example, 50 per cent of men would survive to age 76 years but less than 9 per cent would survive to age 90 years if all men were subject to the observed 1988 mortality rates at each age of life. As with life expectancies (Box 2.3), the survival curves summarise the population mortality experience for the time period under consideration and do not describe the actual mortality experience of birth cohorts in the Australian population.

Life table survival curves summarise current mortality risks by age in a way which relates them directly to expectation of life. The areas between the survival curves and the axis in Figure 7.8 are proportional to the total life years lived by the cohorts and hence to the expectation of life at birth for the cohort. The areas between the curves similarly are proportional to the life years gained by the later cohort in comparison with the earlier cohort because of the changes in age-specific mortality rates between the relevant years.

The survival curve plot shows the distribution of these life years with age and the contributions of changes in survival at various ages to the overall change in life expectancy.

7.2.2 Changing causes of death

Trends in death rates for the major causes of death (Chapter 2) are dominated by deaths at older ages. The major causes of death for older people are, in order of importance, circulatory diseases, neoplasms (cancers), respiratory diseases and digestive diseases. Changes in death rates for these causes underly the dramatic improvements in survival at older ages shown in Figure 7.9. This section examines changes in these deaths rates between 1981 and 1988. These years were chosen to match the years for which national data are available on the prevalence of disability and handicap (Section 7.2.3).

Death rates for circulatory diseases declined between 1981 and 1988 for both sexes in all age groups 50 years and over. Between 1981 and 1988 the rates for men 50–59 years declined by 35 per cent and for women by 32 per cent. Among people 80 years and over, the rates declined by 20 per cent for men and 14 per cent for women (Table 7.3).

The patterns for neoplasms between 1981 and 1988 provide a less optimistic picture. There were declines in rates for men 50–59 years (8 per cent) but increases for men in all older age groups. For example, the increases were about 4 per cent for ages 60–69, 70–79 and 80 years and over. Rates for women increased rates for all ages 50 years and over—at ages 70–79 years there was a 10 per cent increase.

Table 7.3: Main causes of death for persons 50 years and over, age specific rates, sex, 1981 and 1988

	Age group			
	50–59	*60–69*	*70–79*	*80 and over*
	(Per 100,000 population)			
Males				
Circulatory diseases				
1981	483	1,349	3,416	8,964
1988	313	959	2,725	7,190
Neoplasms (cancers)				
1981	306	731	1,525	2,500
1988	282	757	1,589	2,600
Respiratory diseases				
1981	53	182	640	1,736
1988	38	172	582	1,671
Digestive diseases				
1981	58	89	163	418
1988	41	81	158	444
Females				
Circulatory diseases				
1981	160	587	1,991	7,827
1988	109	414	1,622	6,704
Neoplasms (cancers)				
1981	215	422	723	1,187
1988	227	458	794	1,258
Respiratory diseases				
1981	23	69	152	637
1988	27	78	208	634
Digestive diseases				
1981	23	36	107	338
1988	16	39	103	420
	(Percentage change 1981 to 1988)			
Males				
Circulatory diseases	–35.3	–28.9	–20.2	–19.8
Neoplasms (cancers)	–7.8	+3.6	+4.2	+4.0
Respiratory diseases	–28.3	–5.5	–9.1	–3.7
Digestive diseases	–29.3	–9.0	–3.1	+6.2
Females				
Circulatory diseases	–31.9	–29.5	–18.5	–14.3
Neoplasms (cancers)	+5.6	+8.5	+9.8	+6.0
Respiratory diseases	+17.4	+13.0	+36.8	–0.5
Digestive diseases	–30.4	+8.3	–3.7	+24.3

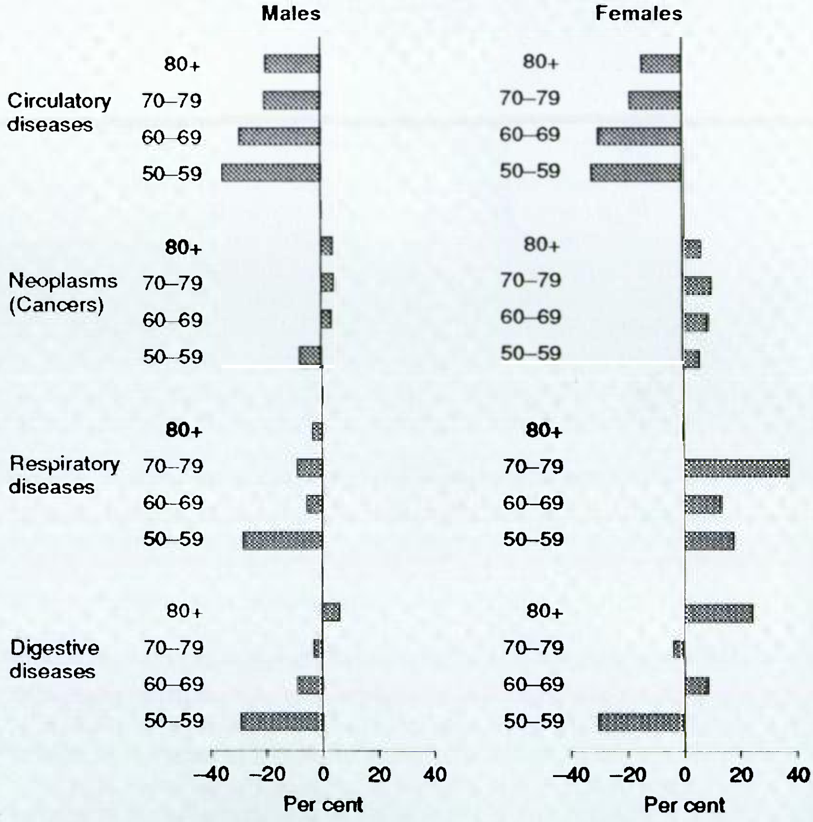
Source: Australian Institute of Health (in press)

Rates for respiratory diseases declined for men at all ages except 80 years and over where there was a small increase. For women, they increased at all ages except age 80 years and over where rates were stable. For the 70–79 age group, there was a 9 per cent decline for men and a 37 per cent increase for women.

Digestive disease rates for men declined in all age groups except 80 years and over. In women, they declined only at ages 50–59 and 70–79 years. For people aged 80 years and over the rates increased by 6 per cent for men and 24 per cent for women. Thus, while the decline in circulatory diseases presents a positive story, there are increasing cancer death rates for men and women, increasing death rates for respiratory diseases, compared with decreasing rates for men, and an increasing death rate for digestive diseases for older women. Caution is needed in using death certificate records for these historical trends. There is known to be considerable variation in the recording of identical cases by doctors in Australia (Leitch, Heller and O'Connor 1987) and elsewhere, and diseases and etiologies among the older population are known to be more complex than for younger groups. Reporting behaviour can change without 'real' change in cause of death. It is unlikely, however, given the magnitude of many of these changes occurring over seven years, that they can be accounted for by changes in reporting on death certificates.

Improvements in survival at older ages reflect reduced mortality from circulatory diseases for men and women and some gains in other causes. The improved survival is, however, accompanied by increases in death rates for cancers particularly for women and increases in

Figure 7.9: Change in age specific death rates 1981 to 1988 for major causes of death for persons 50 years and over



Source: Australian Institute of Health

rates for respiratory disease and digestive diseases again particularly for women. Generally improvements are clearer for men than for women. The declines in mortality from circulatory disease have been accompanied by increasing rates of death from other causes including lower prevalence conditions such as mental disorders.

7.2.3 Survival free of disability and handicap

Disability and handicap are much more difficult to define and measure than death. Data on causes of death has been available since the beginning of the century, but population data for disability are available only for 1981 and 1988 through ABS surveys of handicapped people (ABS 4343.0) and aged and disabled people (ABS 4118.0).

The ABS developed survey methods for identifying disability and handicap using the conceptual framework embodied in the International Classification of Impairments, Disabilities and Handicaps (WHO 1980):

- impairment or cause of disability—any loss or abnormality of psychological, physiological, or anatomical structure or function resulting from disease, disorder or loss, for example loss of a leg, whether from congenital causes, accident or disease;
- disability—a corresponding restriction or lack of ability to perform an activity normally, for example less than full use of arms and fingers;
- handicap—the cultural, economic and social consequences of disability, for example needing assistance getting dressed.

Under these definitions it is possible to be disabled without being handicapped, for example, having poor hearing in one ear but still able to hear adequately.

The presence or absence of handicap, and its level of severity, relate to the interaction between the underlying impairment (medical condition), individual behaviour and attitudes, and the resources and social opportunities and restrictions available to an individual. While impairment and disease may be verified by professionals, disability and handicap are properly assessed by individual responses.

The ABS surveys classified people as not disabled, disabled or handicapped on the basis of answers by a person (or an appropriate proxy) to a series of questions about loss of functional capacity, for example loss of sensory function or mental capacity. If a disability was identified, questions were asked about the presence or absence of handicap in areas of self-care, mobility, communication, employment and schooling. Severity of handicap was determined for self-care, mobility and communication—the most important areas for older people.

For all ages, the number of people reporting disabilities rose from 1.9 million in 1981 to 2.5 million in 1988, an increase of 31 per cent (See Figure 2.7). In contrast to positive evidence about improved survival in older age, for the 65–84 age group, there was increased reporting of disability of 52 per cent and handicap of 72 per cent. The increases in numbers were most marked for people aged 85 years and over, with increases of 78 per cent for disability and 84 per cent for handicap (See Otis and Howe 1990).

Box 7.2: Health expectancies

Life expectancy is a traditional health indicator which summarises the mortality experience of a population in a way that is independent of the age/sex structure of the population (see Box 2.3). A comprehensive index of population health status should take into account not only the overall length of life, but also the quality or healthfulness of life. One such composite measure of health status, *disability-free life expectancy*, was pioneered by Sullivan (1971) and is being increasingly applied in a number of countries (Colvez and Blanchet 1983, Wilkins and Adams 1983, Katz et al 1983, Crimmins et al 1989, Robine 1989, Graham and Davis 1990). This measure incorporates information on the prevalence of disability by age into the standard calculation of life expectancy (from mortality data) to produce estimates of the expected average years spent with disability and free of disability (Table 7.4). It is also referred to as *health expectancy* and *active life expectancy*.

Individuals can make transitions in both directions between disabled and non-disabled states. Interpretation of the conventional life table and derived survival curves is simplified by the fact that only a single unidirectional transition is possible from 'alive' to 'dead'. In contrast, some disabled people may at a later stage in life cease to be disabled. Rogers et al (1989) found surprisingly high transition rates from 'dependent' to 'independent' status at older ages. This does not invalidate the Sullivan method for calculating disabled and disability-free life expectancies, which applies cross-sectional prevalence rates at each age of life to the years of life lived. It thus automatically takes into account disability-free years of people who were disabled at younger ages, ignoring cohort and period effects. The latter effects are explicitly excluded from consideration by the life table methodology. Expectation of years with disability and years free of disability should be regarded as averages for the population over an entire lifespan (from the age under consideration) on the assumption that current age-specific disability prevalence and mortality rates continue to apply. The years of disability need not be concentrated at the end of a disability-free lifespan but may be scattered through the entire lifespan.

Data on prevalence of disability and handicap among Australians were derived from population surveys by the Australian Bureau of Statistics in 1981 and 1988 (ABS 4343.0, 4118.0). Definitions of disability, handicap and severe handicap are in Box 2.6. These definitions were applied in the same way in the 1981 and 1988 surveys to classify individuals on the basis of self-reported assessments, which may change in line with community attitudes and perceptions (see Section 7.2.4).

Table 7.4: Life expectancy, handicap-free expectancy and disability-free expectancy at age 65, sex, 1981 and 1988

	(Years)		
Health expectancy	*Males*	*Females*	*Total*
Life expectancy(a)			
1981	13.9	18.1	16.0
1988	14.8	18.7	16.8
Change: 1981–1988	+0.9	+0.6	+0.8
Handicap-free expectancy(b)			
1981	9.6	11.4	10.5
1988	8.0	9.6	8.8
Change: 1981–1988	–1.5	–1.8	–1.7
Disability-free expectancy			
1981	7.9	10.1	9.0
1988	6.7	8.6	7.6
Change: 1981–1988	–1.2	–1.5	–1.4

(a) Total life expectancy, all health states.

(b) Free of handicap, ie not limited to any degree in ability to perform tasks relating to self care, mobility, verbal communication, schooling and/or employment.

Source: Australian Institute of Health unpublished

There were more pronounced rises over the period in handicap than disability. Between 1981 and 1988, handicap prevalence for the total population grew from 87 per thousand to 130 per thousand, a 49 per cent increase. For the 65–84 age group there was a 39 per cent increase, from 294 per thousand to 409 per thousand, and for those aged 85 years a 35 per cent increase, from 599 to 806 per thousand. This increased reporting of handicap was relatively uniform, around 35 to 39 per cent for all age groups. While the increases among younger people were in the mild handicap category, the increases among older age groups were in the moderate category. There were also small increases in severe handicap for all age groups. A person is classified as severely handicapped if they need assistance with a range of activities of daily living (Box 2.6).

It is possible to use this information on the prevalence of handicap and disability in Australia to calculate the average expectation of years life with disability (or handicap). These 'health expectancies' are a generalisation of the traditional life expectancy dealing with two health states—alive or dead—to multiple health states such as not disabled, disabled and dead (Box 7.2). It is estimated that in 1988 the average life expectancy of 16.8 years for Australians aged 65 years comprised an average of 9.0 years free of disability and 7.8 years with disability. Between 1981 and 1988 it is calculated that Australians gained about a year in life expectancy from age 65 years but lost two years in handicap-free life expectancy and about one year in disability-free life expectation (Table 7.4).

In a similar manner, the 'alive' survival curve (Figure 7.8) can be generalised to multiple health states (Box 7.3). Curves for survival free of severe handicap and survival free of disability have been constructed using the ABS survey data and are shown later in this chapter (Figure 7.19).

Box 7.3: Multistate survival curves

It is possible to generalize the survival curve (Box 7.1) to refer to the probability of survival in various health states at each age. Figure 7.10 shows survival curves for Australian males and females in 1988 for the following health states:

- free of severe handicap
- alive

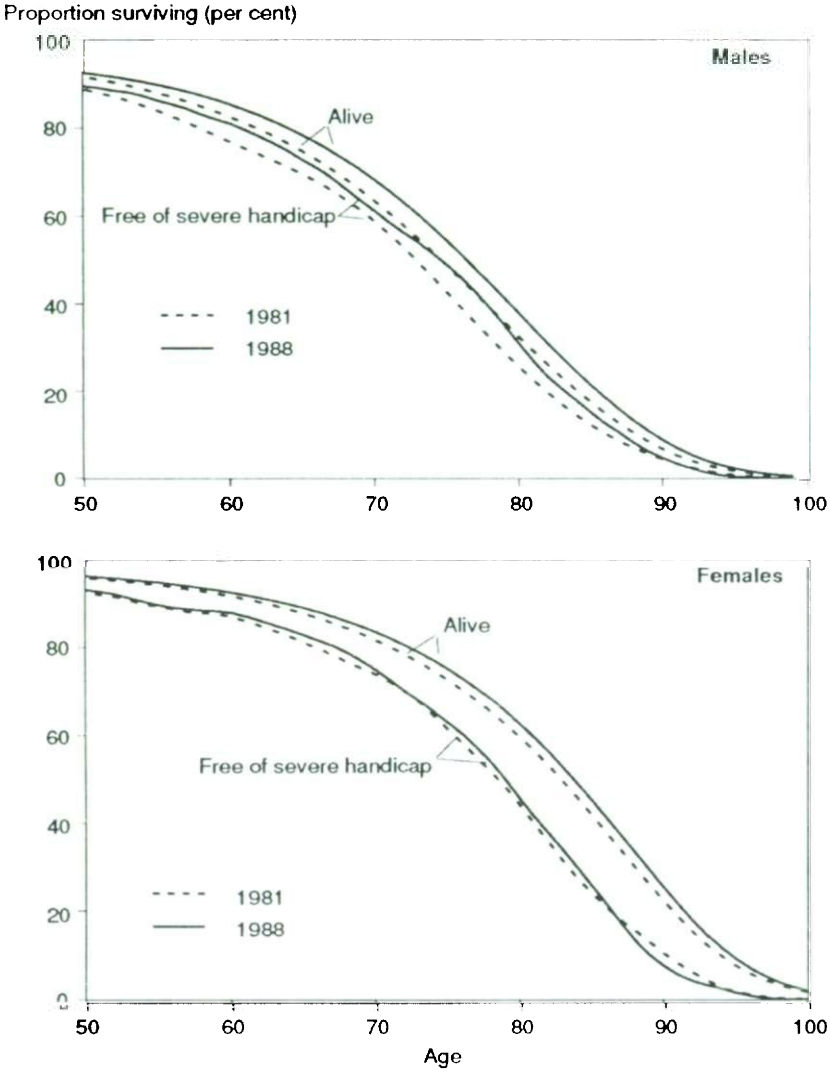
Survival curves for various disability states have been calculated by applying the age-specific population prevalence of the relevant health state to the number of people surviving 'alive' at that age (in the imaginary life table cohort). The area between the 'alive' curve and a disability free survival curve indicates the years of expectation with the corresponding disability state. The area under the disability free survival curve gives the years of life free of disability.

The generalised survival curves differ from the 'alive' curve in that it is possible for individuals to make transitions in both directions between disabled and non-disabled health states (Box 7.2). The disability survival curves should be interpreted as averages for the life table population—some individuals in this population will make more than one transition between the health states bordering the survival curve.

The survival curves should not be interpreted as referring to the proportion of the cohort who have been free of disability at all previous ages; such survivors would define another type of survival curve. Rather, they relate to the proportion of the cohort at each age who are alive and *currently* free of disability; it is this survival curve which relates to the total life years lived by the cohort free of disability.

Curves for survival free of disability, handicap and severe handicap (Figures 7.10 and 7.19) were calculated using prevalence data derived from ABS surveys (ABS 4343.0, 4118.0). Survival free of disability requiring help or supervision (Figure 7.18) was calculated using the estimated proportions of Australians not resident in health institutions who were disabled and needed and received help or supervision from individual people (including family and friends), as well as from organisations (ABS 4118.0). Survival free of institutionalisation (Figure 7.18) was estimated for 1988 using data from the 1986 Census on the proportion of Australians resident in nursing homes, homes for older people and hostels for the disabled. Survival free of chronic disease (Figure 7.19) was estimated for 1981 using prevalence rates from the 1977–78 Australian Health Survey (ABS 4314.0).

Figure 7.10: Survival free of severe handicap and alive survival curves, 50 years and over, 1981 and 1988



Source: Australian Institute of Health

The more stringently defined severe handicap-free survival curves are also shown as they should be less sensitive to possible changes in reporting behaviour (Figure 7.10). They show gains for men in severe handicap-free years matching the gains in years of life but no improvements for women in severe handicap-free years to match the gains in years of life.

The older population has itself been ageing and this has led to increases in reported disability rates within any broad age group. Assuming no change in the age specific prevalence rates observed in 1981, 33 per cent of the 1988 increase in reported handicap for those aged 65–84 years is attributable to changing age composition and 44 per cent of the growth in reported handicap among the 85 years and over group is attributable to population growth among older people. The expected increase in handicap for all people aged 65 years and over is 114,800 compared with an observed increase of 332,800. Thirty-four per cent of the observed increase is attributable to population effects (Otis and Howe 1990). It is among the oldest group that the population ageing effects are strongest. This is important because, until the year 2010, it is the oldest section of the population that is growing most rapidly.

However, the major part of the reported increases in disability and handicap prevalence rates, and consequent decreases in disability and handicap free life expectancy, from 1981 to 1988 cannot be attributed to population ageing. The definitions of disability and handicap incorporate personal and social responses to impairment. Thus, the reported increases in disability and handicap prevalence rates may relate to changes in personal and social attitudes and perceptions as well as to changes in the underlying prevalence of impairments and disease

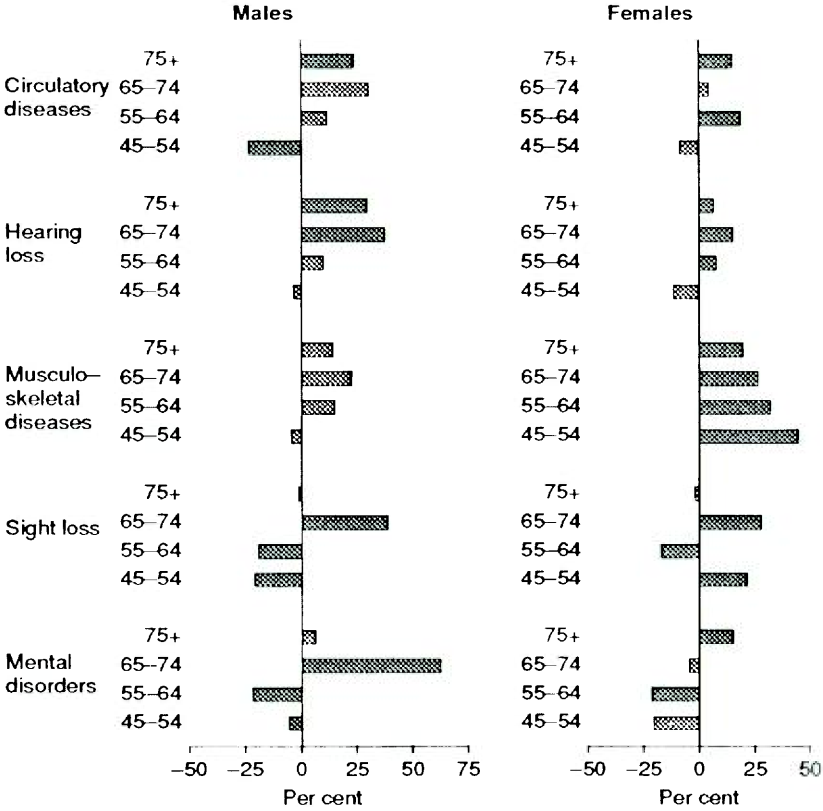
7.2.4 Reporting of disability and handicap

The definitions of disability and handicap were applied in the same way in the 1981 and 1988 surveys. However, these definitions rely on self-reported assessments which may change in line with changing community attitudes towards, and perceptions of, disability. Only 65 per cent of disabled people reported being handicapped in 1981 compared with 84 per cent in 1988, indicating greater reporting of consequences of disability across the two surveys. Changing community and health professional attitudes may result in people being more aware of disabling conditions, or being 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. Rising expectations of life quality were observed in earlier discussions of men's increasing retirement for leisure and women's access to multiple roles and a similar phenomenon may be at work here.

The first ABS survey coincided with the International Year of Disabled Persons in 1981 and the impact of public education campaigns might have increased public consciousness and doctors' diagnoses of disability during the 1980s. For example, the availability of mechanical aids was substantially improved in the Program of Aids for Disabled People which began in 1981. This may have affected reporting levels, as use of an aid is one indicator of mild handicap. There was increased use of orthopedic and pathology services between 1976 and 1986 indicating that increased use of the health system may itself be a factor in increased reporting of disability rates. An important aspect of the reported increases was the rise in musculoskeletal diseases (Section 7.2.5) which may relate to the increase in public awareness of such conditions as osteoporosis, largely promoted by the popular media in recent years.

Clearly the trends in particular disabling conditions were not uniform by age and sex (Figure 7.11), which should lead to caution in attributing all changes to reporting behaviour changes. Individual motivations, social acceptance of particular disabilities,

Figure 7.11: Change in prevalence rates of disabling conditions 1981 to 1988 for persons 45 years and over



Source: See Table 7.5

disadvantage resulting from interaction with the built environment, and the health system are important factors affecting reporting of disability and handicap, as well as underlying natural histories of diseases. Changes in perception have potential consequences for the health system if they are associated with increased demand for services. It is the real consequences of impairment and diseases resulting in individual handicap and need for services that are emphasised in this chapter.

7.2.5 Changes in causes of reported disability

The main causes of reported disability are circulatory diseases, musculoskeletal diseases, hearing loss, sight loss and mental disorders (Table 7.5). Between 1981 and 1988, circulatory disease declined as a cause of death at all ages, but increased in prevalence as a cause of reported disability after age 55 years (Figure 7.11).

Whether this is evidence of changes in risk factor behaviour and treatment or a consequence of delaying death for the groups at risk of these diseases is unclear.

Table 7.5: Type of disabling condition, age specific rates, sex, 1981 and 1988

	Age group			
	45–54	*55–64*	*65–74*	*75+*
	(Per 1,000 population)			
Males				
Circulatory diseases				
1981	33.1	91.2	111.0	139.6
1988	25.4	101.7	144.6	172.6
Hearing loss				
1981	54.5	109.4	138.1	236.8
1988	52.6	120.3	189.7	306.4
Musculoskeletal diseases				
1981	67.8	112.9	126.4	162.1
1988	64.6	129.6	154.9	185.4
Sight loss				
1981	12.9	21.2	32.9	112.1
1988	10.2	17.1	45.6	110.6
Mental disorders				
1981	23.7	49.1	35.7	66.5
1988	22.4	38.4	58.0	70.7
Females				
Circulatory diseases				
1981	30.0	57.4	113.3	188.5
1988	27.4	68.1	118.3	216.2
Hearing loss				
1981	25.9	46.4	87.9	224.9
1988	22.9	49.9	101.1	239.3
Musculoskeletal diseases				
1981	53.6	83.4	133.5	248.4
1988	77.3	109.8	168.3	297.0
Sight loss				
1981	7.1	14.6	37.8	161.4
1988	8.6	12.1	48.2	157.8
Mental disorders				
1981	45.7	50.9	54.9	126.5
1988	36.2	40.0	52.4	145.5
	(Percentage change 1981 to 1988)			
Males				
Circulatory diseases	–23.3	+11.5	+30.3	+23.6
Hearing loss	–3.5	+10.0	+37.4	+29.4
Musculoskeletal diseases	–4.7	+14.8	+22.5	+14.4
Sight loss	–20.9	–19.3	+38.6	–1.3
Mental disorders	–5.5	–21.8	+62.5	+6.3
Females				
Circulatory diseases	–8.7	+18.6	+4.4	+14.7
Hearing loss	–11.6	+7.5	+15.0	+6.4
Musculoskeletal diseases	+44.2	+31.7	+26.2	+19.6
Sight loss	+21.1	–17.1	+27.5	–2.2
Mental disorders	–20.8	–21.4	–4.6	+15.0

Source: Australian Bureau of Statistics 4118.0, 4343.0

After age 65, reported prevalence rates of musculoskeletal diseases in women were greater than those for men. These rates increased in both sexes between 1981 and 1988, except for men aged 45 to 54 years. The increases were greater for women than men, with an increase of 44 per cent for women aged 45 to 54 years while men's rates at that age declined.

In contrast, reported prevalence of hearing loss was greater among men than women and increased markedly for both sexes over the age of 55 years. The prevalence of hearing loss increased for both sexes after the age of 74 years.

Below age 64 prevalence of sight loss was higher for men but crossed over to be higher for women after age 65 years. There was no discernible pattern in the changes in prevalence for men and women over the period.

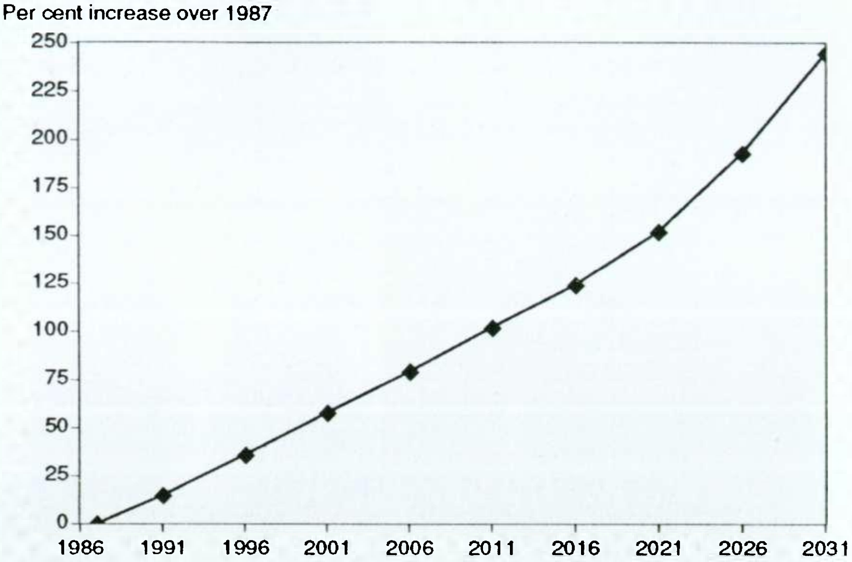
Reported prevalence of mental disorders was lower than other causes discussed. Between 1981 and 1988 rates declined except for men aged 65 to 74 years (a 62 per cent increase) and men and women aged 75 years and over.

It is important to disaggregate the increasing total disability at older ages to ask more specific questions about different types of disability. Various explanations can be tested for specific disease types within age and sex groups. In the absence of such research, explanations of the changed rates of cause of disability remain as speculations. One final caution is needed, because causes of reported disability were self-reported and not medically verified in the ABS surveys, it is possible that respondents could have inaccurately reported some causes or not fully understood the purpose of the question.

7.2.6 Dementia

Reported disability from mental disorders rose, between 1981 and 1988, for men over 65 and women over 75. In 1988 the female rate of 146 per 1,000 for the 75 years and over age group was double the male rate of 71 per 1,000. One of the most severe of the conditions is senile dementia of two major types—Alzheimer's and multi-infarct. As with most mental disorders, there is no one prevalence figure but rather a range of rates for different definitions of the syndrome. Statistically integrated evidence from many studies shows a consistent trend for prevalence to increase exponentially with age (Jorm and Henderson 1990). The reported prevalence rate for dementia doubled with every 5.1 years of age. The exponential rise was steeper for Alzheimer's (doubling every 4.5 years of age) than for multi-infarct vascular dementia (doubling every 5.3 years). Assuming prevalence rates at specific ages remain constant, Australia can expect an increase of about 100 per cent in the number of dementia cases to the year 2011 (Figure 7.12).

Figure 7.12: Projected increases in dementia cases, 1987 to 2031



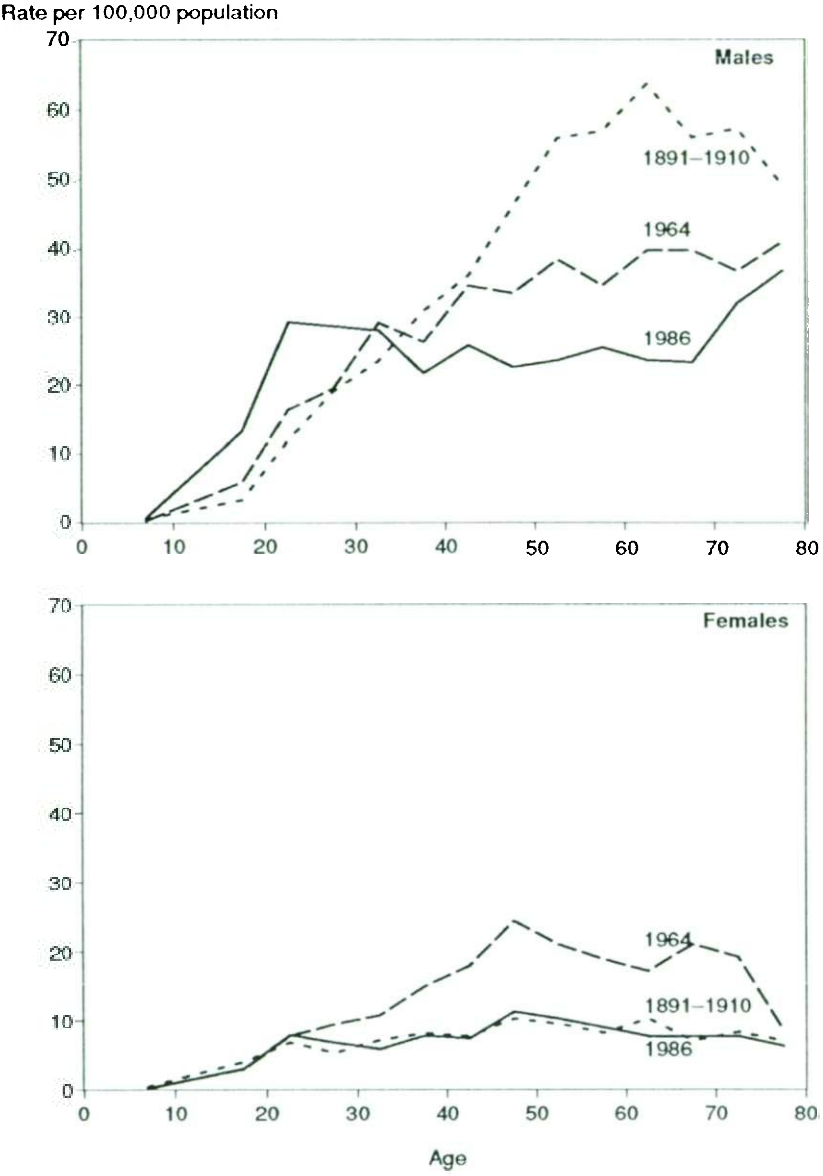
Source: Jorm and Henderson 1988

7.2.7 Suicide

While most public attention has been devoted to high rates of youth suicide (see Section 3.1.2), the age specific rate of suicide is now highest for older Australian men (Hassan 1990). Since data became available around the turn of the century male rates have been much higher than female rates. Younger and middle aged women have higher suicide rates than older women. Between 1891 and 1910 men's suicide rates were higher than in 1964 but, from then until 1986, younger men's rates increased and rates of older men did not decrease at the same rate as for middle aged men (Figure 7.13). The accuracy of suicide rates is a major field of academic study in itself and changes in recording, if they were substantiated, might modify conclusions from these figures. In the absence of contrary evidence about reporting, a need for more concern about suicide among older men is indicated. The high rates of suicide among elderly men raise different issues to those among adolescents and young men.

It is illegal in Australia to assist or counsel someone in the means of committing suicide. There are advocates of voluntary euthanasia (literally 'good death') who seek access to assistance with humane means of death for those with poor quality of life with no expectation of improvement. The issue of assisted or enabled death has moral and practical difficulties for the community and health professionals. Of a less controversial nature are 'living will' and 'enduring power of attorney' legislation which allow a trusted third party to express an older person's wishes and to advocate for them after they become incompetent to do so themselves.

Figure 7.13: Suicides, age specific rates, 1891 to 1986



Note: Age groups plotted at mid–point of range

Source: Australian Bureau of Statistics 3302.0

7.2.8 Accidents and injuries

There is a continuum rather than a sharp distinction between intentional and unintentional injuries and between fatal accidents and suicide. Injuries generally are most common among people aged 70 years and over and the consequences in bed–days and death rates are most severe at those ages compared with younger groups (See Figure 3.2). Some 16 per cent of all handicapped people reported accidents as the cause of their disabling condition in 1981. While most accidents occurred at work or on roads, more than one third of all disabled people in institutional care were injured at home. Death rates, hospital separation rates and occupied bed–days from accidental falls begin to rise rapidly after age 70 and peak at age 80 and over. While motor vehicle accidents are highest in prevalence and consequences between ages 15 and 30 years, they begin to rise after age 70 when the rates for injuries to pedestrians are about four times higher than for any other age group. Suicides and self inflicted injuries are most likely to be fatal for people aged 70 years and over but their consequences, in bed–days and hospital separation rates, are highest for younger groups between ages 20 and 40 years.

7.2.9 Oral health

Until recently, a large majority of older Australians had no natural teeth. The 1979 dental health survey conducted by the Australian Bureau of Statistics (ABS 4339.0) reported that 66 per cent of Australians aged 65 years and over had no remaining natural teeth, whereas the most recently available national data from the National Oral Health Survey of Australia (Barnard 1989) reported that the figure had declined to 50.2 per cent. Substantial reductions in the numbers of older people with no natural teeth have been projected, with the percentage of people aged 60–64 without natural teeth expected to reduce from 40 per cent to 27 per cent during the next decade (Spencer and Lewis 1989).

As older Australians retain increasing numbers of natural teeth, there is potential for an increase in the prevalence of oral disease within the community. This is supported by studies of adults of all ages, including the National Oral Health Survey and studies in Brisbane in 1984 (Powell and McEniery 1985) and Melbourne in 1985 (Spencer et al 1988), which showed the prevalence of dental decay and periodontal (gum) disease among older adults was comparable to that observed in middle age. The prevalence of dental decay in current populations of people aged 65 years and over who have some natural teeth exceeds the prevalence observed in primary school children. An Adelaide study of people aged 60 and over (Centre for Ageing Studies 1990) demonstrated the complexity of oral disease in older adult populations. Dental decay was distributed between the crowns of teeth (24 per cent of people) and the root surfaces (28 per cent). The latter form of decay is a characteristic of later adulthood, particularly as root surfaces become exposed because of recession of the gums around the teeth. Another 28 per cent had some severe form of periodontal disease. No studies have specifically investigated the distribution and determinants of oral disease among older adults.

These emerging patterns of disease have prompted concern that untreated dental disease or other chronic dental disorders may contribute to pain, discomfort, disability or ill health among older adults. Although there is a lack of adequate data, findings from the Adelaide study provide some basis for this concern (Spencer, Slade, Richards and Gorkic 1989). Among people aged 60 and over, 47 per cent reported oral pain or discomfort, 36 per cent had some difficulty eating, and 6 per cent said oral disorders had caused difficulty with social interaction (such as talking and smiling).

7.2.10 Medications

Older people are the major users of prescribed and non–prescribed pharmaceuticals in Australia. Pensioner prescriptions under the Pharmaceutical Benefits Scheme account for 25 per cent of all prescribed drugs and 55 per cent of pshychotropic drugs. Pensioner prescriptions have shown an annual increase of 6 per cent compared with 2 per cent increase in the numbers of eligible pensioners. According to PBS records, in 1985 pensioners had an average number of 26 prescriptions per person compared with four per person among the non–pensioner population (Kurowski 1989).

The extensive and increasing use of pharmaceutical drugs by older people has begun to attract attention. There is an increasing body of evidence that indicates older people are physiologically at greater risk of experiencing adverse outcomes associated with drug use. The frequency of drug related adverse reaction also increases with the number of drugs taken (polypharmacy) so that older people are particularly vulnerable to adverse drug reactions. There is evidence that social problems in older people may be significant precipitators to medication use and that the extent to which older people are prescribed multiple medications is the result of reliance on drug therapies, a lack of emphasis on preventative–health measures and a lack of appropriate long–term care strategies for chronic conditions.

Hoarding and wastage of pharmaceuticals does not appear to be any higher among pensioners and older people than among other sections of the community (Harvey 1987). See section 5.3 for details of use of pharmaceuticals in Australia.

Older Australians of non–English speaking background (NESB) have been found to experience particular difficulties with medication use, and surveys have indicated that half of older NESB people do not have their medications explained to them in their own language.

Given the extent to which older age has been paralleled by increased use of medications, and by increasing use of multiple medications, the projected growth in the numbers and proportion of the very old (those 75 years and older), from 4.1 per cent of the population to 9.7 per cent in 2031, indicates that the rate of consumption of pharmaceutical medications will increase dramatically.

In the 1989–90 Federal Budget the Government established a program to support community–based education initiatives addressing the rate of consumption of pharmaceuticals, and particularly the use of multiple medications by older people.

National Better Health Program strategies for improving the health of older people include a medication program to promote safe and sensible prescription, dispensing and consumption of medications.

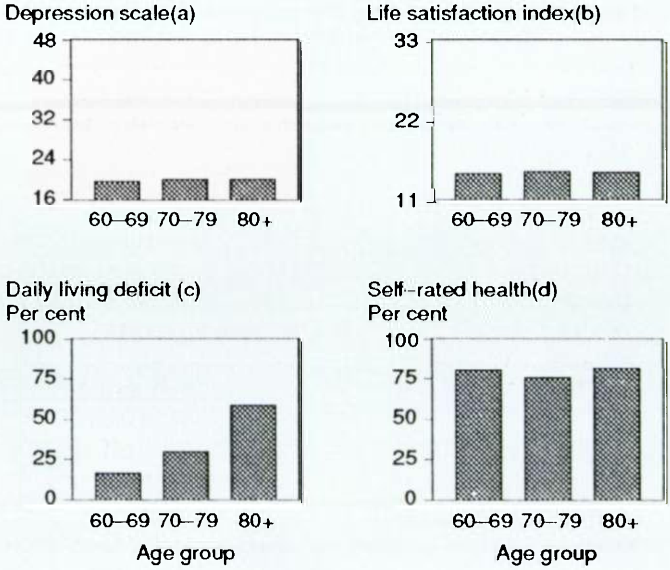
7.2.11 Psychosocial well-being

The one category of health status that does not decline with age is psychosocial well-being. Among non-institutionalised populations life satisfaction, measures of self-esteem and depressive symptoms are all relatively stable by age while functional status (activity of daily living—ADL) declines, paralleling increasing disease prevalence (Simons and McCallum in press) (Figure 7.14).

Psychological states are affected by adjustment to catastrophic events in life such as death of a spouse or institutionalisation, or to life transitions such as retirement. Around the time of such events well-being measures are lower but tend to improve as people adjust to the new circumstances, hence age itself does not tend to be associated with declines in psychological well-being.

The best predictor of mortality in epidemiological studies of older people is not doctors' prognoses or biomedical measures but a simple question asked of older people: 'How would you rate your health—excellent, good, fair or poor?' (Mossey and Shapiro 1982; Idler, Kasle and Lempke 1990). More older people rate their health as good or excellent than do doctors.

Figure 7.14: Psychological well-being by age group, women 60 years and over, 1988–89



(a) Centre for Epidemiology Studies Depression Index (16 = least, 48 = most)
(b) Life satisfaction index (11 = most, 33 = least)
(c) Daily living deficit – impaired in at least one task of daily living
(d) Self-rated health: good to excellent

Source: Simons and McCallum in press

7.3 Health and support services for older people

7.3.1 Costs

It is the long term care needs of older people that distinguish them the from acute, curative needs of the young, and raises concerns about costs. The older person's perception of health status is interwoven with the features of the health and community services system rather than distinct from it. The health status of older people itself becomes a matter of political and economic interest when it attracts a service or subsidy from public sources.

The nature of government policies rather than demographic ageing underlie the increasing costs of providing services for older people. Between 1976–77 and 1981–82 Commonwealth recurrent expenditures on nursing homes increased 144 per cent (an average annual increase of 19.5 per cent), and became the subject of inquiries and concerted policy development. Between 1985–86 and 1990–91 the rate of increase was constrained to 59 per cent (an average annual increase of 9.7 per cent), about the rate of increase of age pension expenditures (Table 7.6). At the same time the growth in the population aged 70 years and over was 18 per cent for the second half of the 1970s and 13 per cent for the second half of the 1980s.

Table 7.6: Changes in Commonwealth expenditure on aged persons, 1976–77 to 1981–82 and 1985–86 to 1990–91

	Percentage change	*Expenditure ($m)*		*Percentage change*
	1976–77 to 1981–82	*1985–86*	*1990–91*	*1985–86 to 1990–91*
Geriatric assessment	—	4.0	26.0	550
Nursing homes(a)	144	1,010.0	1,607.5	59
Hostels(a)	118	59.4	337.8	468
HACC(b)	70	115.0	282.9	146
DNCB(c)	162	25.4	33.5	32
Age pensions	82	5,897.2	9,088.3	54
		('000)		
Population 70+	18	1,148.4	1,292.6	13

(a) Recurrent expenditure.

(b) Home and community care program.

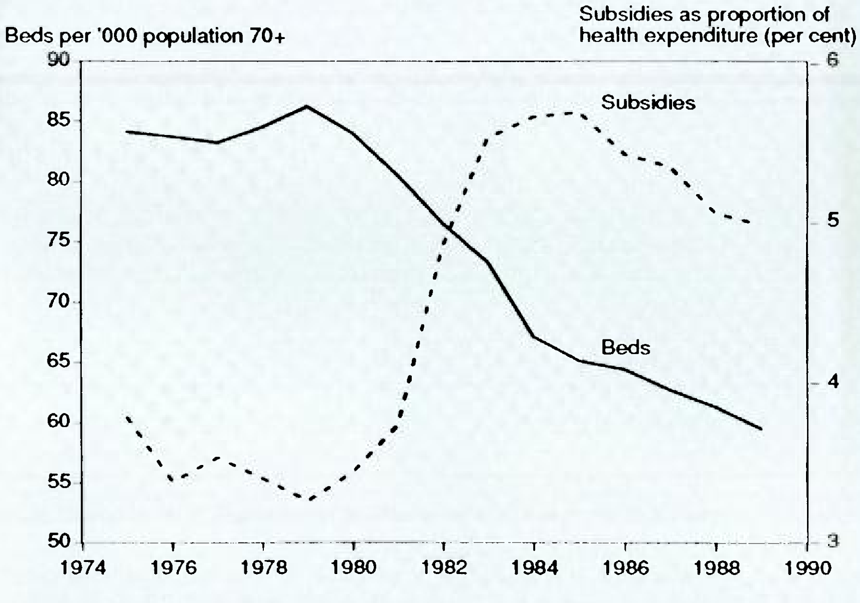
(c) Domiciliary nursing care benefit.

Source: Howe 1990

7.3.2 Institutional long term care

The provision of nursing home beds in Australia shows most clearly the relative unimportance of demography in the changes in costs of providing specific services to an ageing population. In 1975 there were an estimated 84 beds per 1,000 of the population aged 70 years and over but by 1989 this had declined to 59 beds per 1,000 (Figure 7.15). The population aged 70 years and over was rapidly increasing, doubling from .651 million to 1.2 million people over the same period. Commonwealth expenditures on subsidies rose from $160 million in 1974–75 to $1,295 million in 1988–89. As a proportion of health expenditures nursing home subsidies rose from 3.5 per cent in the mid-1970s to 5.5 per cent in the mid 1980s but then stabilised and declined. In all this demography was a small player and policy a major one. Decisions to subsidise capital costs subsequently involved the Commonwealth in subsidies for running costs. In response to cost pressures, the Commonwealth redefined the goal of nursing home care and introduced geriatric assessment to ensure that nursing home beds were provided to the most dependent older people.

Figure 7.15: Nursing home beds per 1,000 population aged 70 years and over, nursing home subsidies(a) as a proportion of total health expenditure, 1975 to 1989



(a) Commonwealth government subsidies comprising nursing homes benefits and nursing homes assistance including deficit–financed nursing homes. Data are for financial years 1974–75 to 1988–89

Source: Australian Institute of Health
Commonwealth Department of Community Services and Health

In an economic view of policy, different categories of expenditures may be substituted for one another, for example, increasing retirement income support might allow people to pay for medical or pharmaceutical services. While there is a point at which domiciliary care becomes less cost effective than institutional care, up to that point care at home can be substituted for nursing home care. A problem arises if one form of care rather than another receives a greater public subsidy, because people are likely to use that service disproportionately more. This has occurred with the relative imbalance in public subsidy of institutional care relative to home and community care. Perhaps the worst problem area for this imbalance is with care at home provided by family and neighbours. While it is apparently costless in terms of the annual budget, it is not costless in an economic sense. An adult daughter caring for a dependent parent may be foregoing opportunities for paid work in which there may be a greater gain to the economy. The key problem for informal carers is that their work is socially and economically undervalued because it is not costed in formal national accounts.

7.3.3 Informal long-term care

The most important and most accessible source of services for older people is the informal social network made up of immediate family, extended family, friends and neighbours.

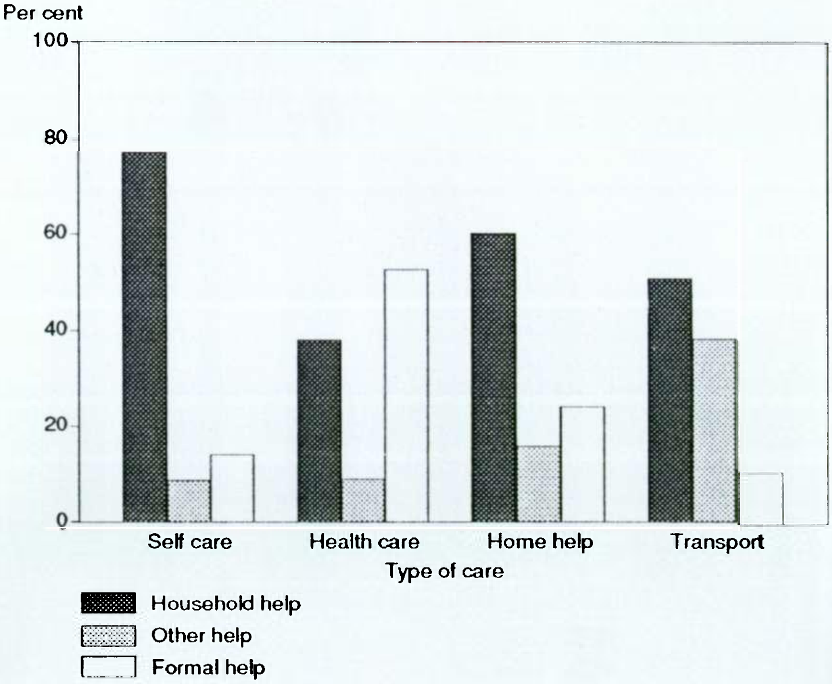
Spouses are the first point of primary care because of their proximity and moral obligations to their dependent spouse. Daughters and sons have close emotional ties with their older parents and are significant providers of care to people over the age of 75, with daughters providing 30 per cent of care to this age group. While daughters and, to a lesser extent, sons freely give such services, they are under no necessary obligation to do so.

Australia, from the turn of the century, legislated to provide significant public responsibility for the support and care of older people, through the Commonwealth pension legislation and later through the provision of residential care. This has resulted in support of older Australians becoming a shared public and private responsibility.

Despite the close emotional ties of families there are situations where care at home is inappropriate. Some people may be physically, financially or emotionally unable to meet the needs of dependent older people. Other situations arise in which older people are physically, psychologically or economically abused by people in their near family.

It is more probable, because of close emotional ties and altruistic motivations, that spouses and adult children will undertake care tasks that require long–term, close contact and involve intensive needs. For example, severely disabled older people need continual help with a range of activities of daily living such as bathing, eating, and going to bed. The Carers Survey conducted with the 1988 Disability Survey shows that, for severely disabled people aged 60 years and over, eight out of 10 helpers were people who lived in their household and about one in 10 were informal helpers from outside the household (Figure 7.16).

Figure 7.16: Type of helper by type of care, persons 60 years and over



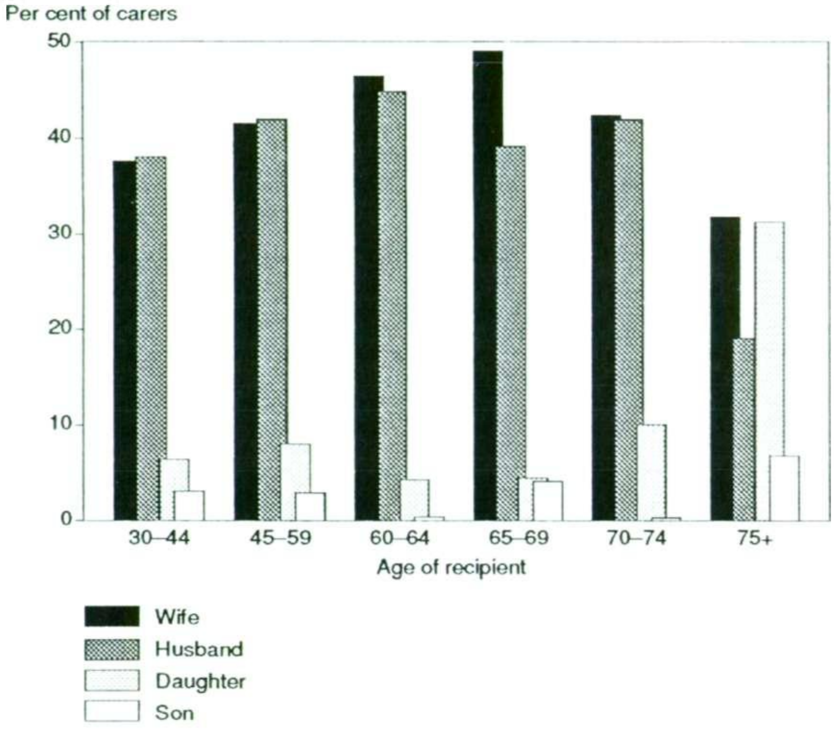
Source: Australian Bureau of Statistics 4122.0

There are highly differentiated skills and motivations in the informal care market. Friends and neighbours have less strong emotional connections to needy older people and less time which they wish to give in help because they are committed to their own family's needs. They are best fitted to tasks which are limited in time and require less emotional commitment, such as providing transport, home maintenance, personal affairs and mobility. In tasks such as adjustment to widowhood, older women may prefer another widow as an emotional support rather than a daughter or married neighbour.

Formal health care service providers require, sometimes as a statutory responsibility, specific professional or technical skills and knowledge. These are, primarily, medical, nursing, paramedical or allied health skills or training. Skilled or specifically trained providers comprise 50 per cent of all health care service providers, but only between 10 and 20 per cent of providers of other care services. So–called 'informal' providers such as relatives, neighbours and friends are the principal providers of non–health care services.

The patterns of help vary with the age of the person receiving help. People aged 75 years and over comprise more than half the older population receiving self care and health care services, but only about 40 per cent of the older population receiving transport and home help services. Concomitantly, 'younger' older people are more likely to have help with transport and home help services and less likely to have self care and health care services.

Figure 7.17: Type of carer by age of severely handicapped person, 1988



Source: Australian Bureau of Statistics 4122.0

The community view is that daughters are the primary providers of care to older people, but in fact spouses bear the principal responsibility. For people under 70 years of age, spouses comprise almost 100 per cent of the carers living in the same household as the older handicapped person receiving care (Figure 7.17).

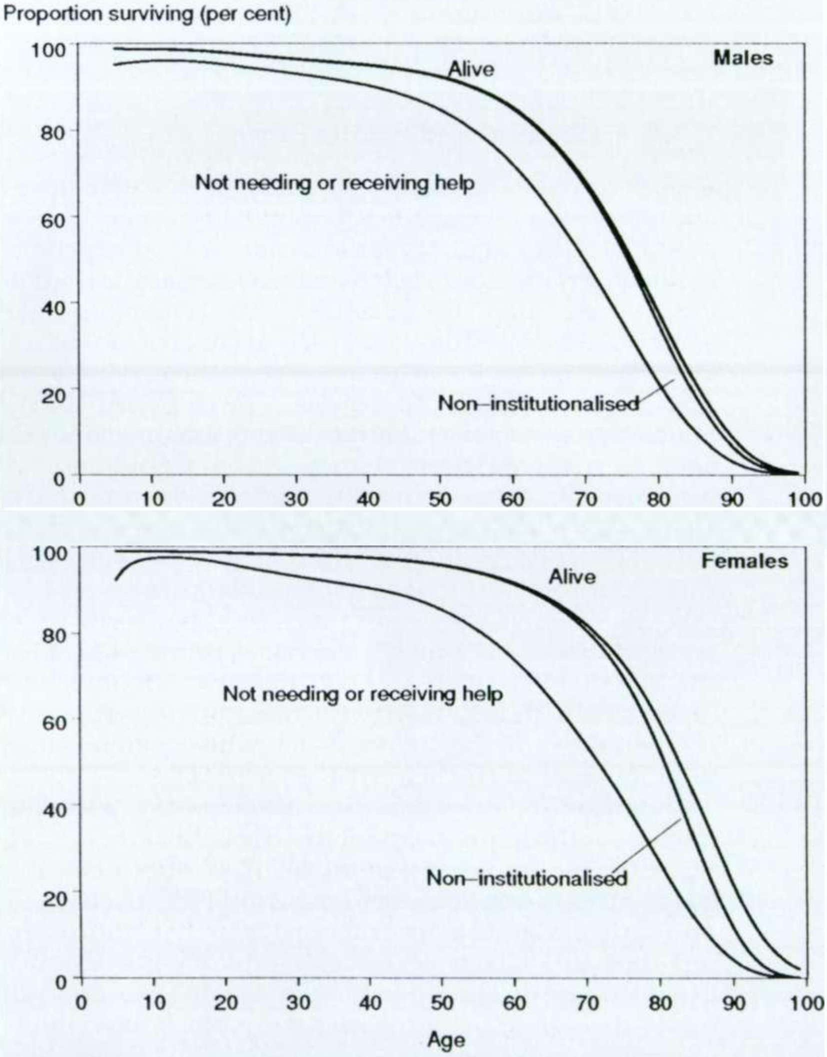
For people 70 years and older, daughters become more significant, becoming 10 per cent of coresident carers at this age and increasing to 30 per cent of coresident carers of handicapped people aged 75 years and older. Sons are coresident carers for 5 per cent of handicapped people in this older age group.

The 1988 ABS Carers' Survey was limited in that it did not count carers outside the household. For example, it did not count as primary carers the many daughters who travel to care for a parent living alone or to assist one parent caring for another. While the central role of spouses in caring needs to be recognised, so do the burdens borne by adult daughters. This situation for middle aged women is one that is problematic in a society that offers non–discriminatory access to work careers and an absence of coercion in choice of family care roles.

7.3.4 Formal long-term care services

Publicly funded service providers are an important support for informal carers and for older people with long-term care needs. The Home and Community Care Act (HACC) of 1985 bought the Commonwealth and States and Territories together in a cost-shared program of formal service provision aimed at greatly expanding the formal long term care services available in the community. However, informal providers are still the major providers of care. An indication of the increase in service demands by age can be shown in survival curves free of need for help and free of institutionalisation (Figure 7.18). The proportion of the population institutionalised in

Figure 7.18: Independent survival(a) and institution-free survival curves, 1988



(a) Not needing or receiving help with activities of daily living

Source: Australian Bureau of Statistics 4118.0 and unpublished data nursing homes, homes for the aged and hostels for the disabled in 1988 rose from about 0.4 per cent of men and women aged 60 years to an estimated 7 per cent of men and 11 per cent of women aged 80 years. The proportion of institutionalised people who needed and received help, either formal or informal, rose from 15 per cent of men and 19 per cent of women aged 60 years to 39 per cent of men and 50 per cent of women aged 80 years. Clearly, women of all older ages need services to a greater extent than men, and their needs increase with age. While the need for services may change, and even possibly reduce, so that an older person may no longer need a particular care service or may be able to leave long term care and return home, it is nevertheless clear from the independent survival and non–institutionalisation survival curves that the overall probability of needing formal services or institutional care rises rapidly with advancing age.

7.3.5 Hospital and medical care

As well as needs for long–term care, older people have relatively high acute hospital care needs (Chapter 5). Between 1976 and 1986 there was a 12.7 per cent a year increase in total expenditure on private medical services for which benefits were paid but, unlike the reported increasing rates of disability, the changing age composition accounted for less than a half of one per cent of that annual increase. The major factor in the increase was the general growth in services and increasing fees. There was a large growth in therapeutic and diagnostic services which was strong among older people. For those aged 75 years and over the increases in fee–adjusted cost per service were nearly 20 per cent with over one–third for pathology services alone. Those aged 85 years and over received almost four times more pathology services in 1986 than in 1976. It was only in GP services that there were reductions in use among older people over the period. The process of medicalisation can be seen in the increasing specialisation of the medical services provided to older people and in the increasing tendency of GPs to refer patients to specialists. Such a significant change in services needs to be evaluated on the basis of the quality of life gained for these increasingly specialised interventions in the health of older people.

The introduction of casemix measures is expected to have a major impact on the acute hospital treatment of older people. In the United States it was predicted that the result of introducing diagnosis related groups DRGs would be 'sicker and quicker' discharge of older people. The early evidence is that older people are being discharged 'quicker' but that this is not necessarily producing worse health outcomes (Russell 1989). The introduction of DRGs in Australia will require better discharge planning and more home and community services to replace care previously provided during longer stays in hospital. Unless this substitution is achieved older people's acute care needs would have been better served under the old block grant system.

7.3.6 Dental services

Older adults have often been characterised as infrequent users of dental health services. However, when utilisation by people with natural teeth (dentate) and those without natural teeth (edentate) is examined, much of the low utilisation is observed among the edentate portion of the older adult population (see section 2.6.2). The National Oral Health Survey findings indicate that more than 50 per cent of people aged 65 and over had attended a dentist within the previous 12 months and this rate of utilisation was within the range of 51 to 58 per cent for dentate adults of all ages.

Access to dental services is restricted for older people on limited incomes because publicly subsidised services are usually centrally based and have long waiting lists, and private health insurance offers limited cover.

The National Health and Medical Research Council recognised the need for greater emphasis on the dental care of older people in 1973, and in 1988 established an expert panel on the Oral Health Care Needs of Older People.

Substantial differences exist in oral health status and use of dental services within the older population. Among non–institutionalised people, those with lower educational attainment and lower income levels tend to have a higher prevalence of edentulism, and a higher prevalence of dental decay has been observed in men (Powell and McEniery 1985; Spencer et al 1988). Older adults living in nursing homes are more likely to have no natural teeth, and those with natural teeth appear to have more severe forms of disease requiring more extensive treatment (Stockwell 1987; Holman, Lam and Larsen 1988), compared with non–institutionalised people. Older people who are handicapped and homebound appear to be at risk of more serious levels of disease, and they face particular barriers in obtaining care (Crack, McDougall and Spencer 1980).

There will be a need for more comprehensive and complex dental care for older Australians in the future. Although a large proportion of older adults who retain natural teeth continue to experience mild or moderate levels of dental diseases, it is recognised that preventive care (particularly through the provision of fluorides and regular preventive periodontal care) can be effective in their control.

7.3.7 Health promotion and prevention

The application of health promotion and prevention of disease for older people is at a very early stage in Australia (Kane 1988). The Project Planning Team for the Health of Older People priority area of the National Better Health Program proposed three goals for health promotion for older people:

- to improve the health and independence of older people;
- to promote positive images of ageing as a means of promoting independence; and
- to identify and reduce inequities in health status among older Australians.

The Project Planning Team proposed that the National Better Health Program should have as targets the:

- reduction of morbidity and mortality resulting from preventable injury;
- reduction in prevalence of functional limitations experienced by older people;
- reduction in inequalities in health status among older people by redirection of resources to those most in need;
- increased participation of older people in individual health enhancement.

The strategies proposed to address the goals and targets were:

- the promotion of Social Participation, through four component programs encompassing policy development, social involvement through 'wellness centre' program and community education program; nutrition and pre–retirement projects;
- integration of Health and Welfare Services through the development of local area coordination strategies for primary health care services; and
- specific intervention strategies including medication education and information; mobility and safety projects; professional skills development and discharge planning promotion.

The National Better Health Program is a Commonwealth/State cost–shared program launched in November 1989 (Section 4.3). The implementation of projects focused on older people has varied across the States. National projects include a medication program and a national promotion campaign. Four projects have been approved in NSW, including wellness centres, which are being established in South Australia also. Victorian projects are directed at injuries among older people and hip fractures among rural older people. An project in the ACT is directed at the isolation of older people.

The projects reflect the complexity of health for older people and the three strategies outlined in the program. Better knowledge of the processes of ageing and the relevant risk factors for disease and disability, as well as evaluations of interventions, are needed.

7.3.8 Future issues

While older people are major users of health services, the ageing of the population is at best a minor factor in historical increases in costs. Technological changes, inappropriate or poorly directed policies, and generally increasing usage rates have all played a part. Many policy developments have begun to target health and community services expenditures towards more appropriate goals. Further rationing of publicly provided nursing home beds and home and community services will occur as the increasing numbers of 'old old' create increased demand. One important development will be the expansion of support to informal carers and the coordination of formal, public services with those provided by family, friends and neighbours. Thus policies will need to be well managed to allow opportunities for growth in new policy areas like better support for informal carers. However, moderate increases in economic growth can cover age related increases in costs of health and welfare for older people (Economic Planning Advisory Committee 1988).

Table 7.7: Expenditure on hospitals, nursing homes, medical services and pharmaceuticals, 1975 to 2025

	1975	*1985*	*2005*	*2025*
Expenditure ($m)	11,820	12,686	14,564	17,219
Cost per person ($)	749	804	922	1,091
Change (%)		7.3	14.8	18.2
Annual change (%)		0.7	0.7	0.8

Note: These estimates were based on:
- 1985–86 total population;
- 1985–86 expenditure by age group;
- a varying age distribution.

The age distributions were:
- 1975 and 1985 at at June 30;
- 2005 and 2025 projected ABS Series C.

Source: Australian Institute of Health unpublished
Australian Bureau of Statistics 3201.0; 3222.0

There is no evidence of a budgetary crisis arising from population ageing but cost pressures do exist. Taking expenditures on hospitals, nursing homes, medical services and pharmaceuticals, there was a 7. 3 per cent increase in costs per person between 1975 and 1985 (Table 7.7). Projecting the patterns of expenditure in 1985–86 shows that there is a substantial expected increase to 2005 of 14.8 per cent and to 2025 of 18.2 per cent because of population growth alone.

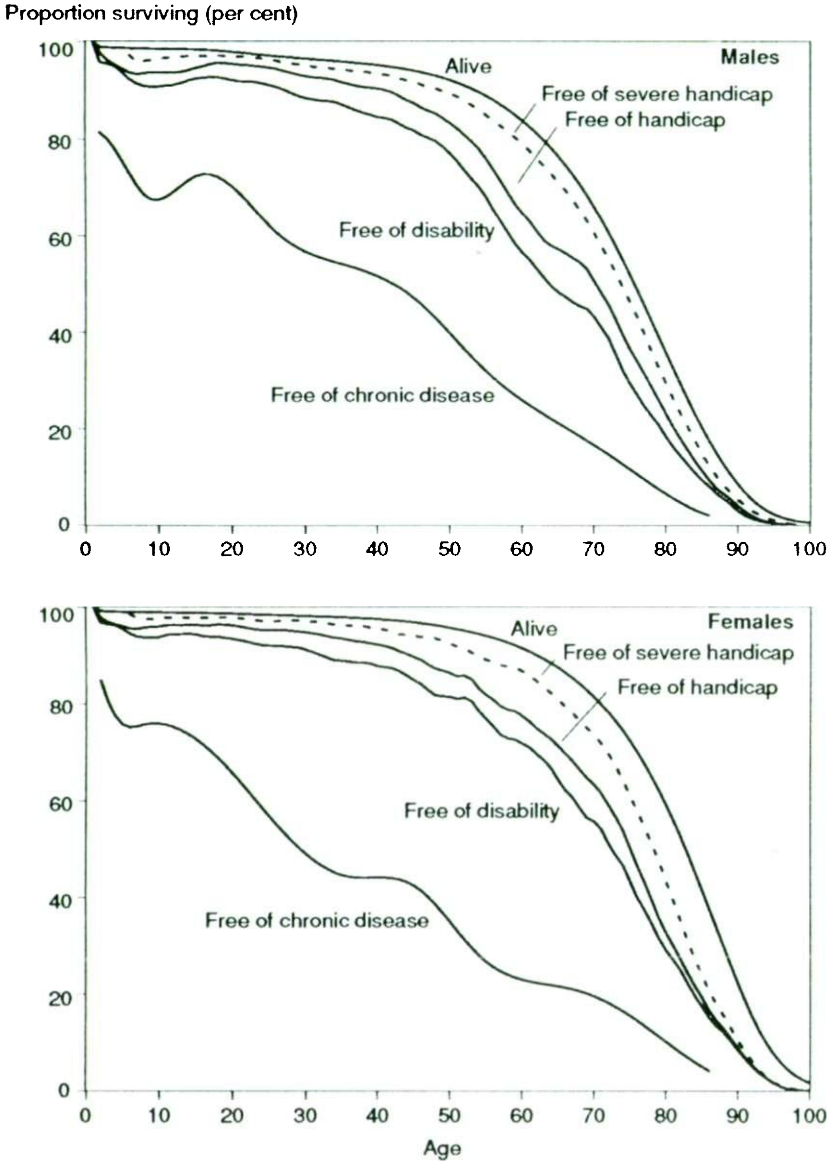
7.4 Assessment of health quality in later life

This evaluation of the health quality of later life has stressed the supportive role of the social and economic fabric and of the health and community services system. The main historical advances observed have been firstly increases in the quantity of later life particularly from declining death rates from circulatory diseases and, secondly, relative increases in public expenditures on health and community services. On the other hand self reported disability and handicap rates increased markedly among older people during the 1980s. The clear conclusion is that issues of quality of later life must now be given more attention in research and policy discussions.

A summary of indicators of health quality (Figure 7.19) shows decreasing expectations of quality by age from about age 50 for men and women. Survival free of chronic disease is shown using the same method as for other health survival curves (Box 7.3). While 'rapidly lethal' disease is more prevalent among men, chronic diseases, disability and handicap are more prevalent among women.

Health promotion targets are increasingly set in terms of aggregate gains in life expectancy, normally before and after age 65 years, expected from alteration in risk factor behaviour. The increasing expenditure on conventional health services and small but growing expenditure on health promotion and prevention need to be also directed to improving health quality indicators. Using disability surveys, a worthwhile target for 1995 might be to improve disability-free survival on track with improving mortality. A more ambitious target might be to hold disability rates at 1981 levels while

Figure 7.19: Survival curves free of chronic disease, disability, handicap, severe handicap and alive survival curve, 1981



Source: Australian Bureau of Statistics 4314.0, 4343.0

mortality continues to improve (Mathers 1990). Given the counter trends of increasing health and services expenditures and decreasing disability-free life expectancy, this provides a major challenge for policymakers.

A prerequisite for monitoring disability and handicap rates is the conduct of regular surveys. The aggregate disability rates need to be broken out into specific causes and expectation factors need to be assessed in social and epidemiological research. The total life chances of women relative to men and between other groups in Australia's heterogenous population need to be bought into these analyses if effective interventions are to be designed.

There remain profound ethical issues about policies and practices affecting the quantity and quality of later life. Should guidelines be available to physicians about when to prolong life and when to provide a caring or palliative option? Such choices are already made but not necessarily on any consistent basis. Should criteria be available about what interventions improve quality life and which marginally extend life without improving quality? Might choices be made in favour of hip replacements and corneal transplants and against coronary bypass surgery amongst the very old? Are there grounds for blocking public investment in research on medical and pharmaceutical developments which marginally extend life without improving its quality? Can key indicators of quality of later life ever be decided? These are the choices and issues created by social, economic and medical developments which have produced aging societies in Australia and throughout the world.

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8 Review of developments in health statistics

For many years national data on Australia's health and health services have been inadequate for monitoring changes in health and for informed and effective planning. However, in the past two years there have been a number of developments in the collection of national data.

8.1 Organisational changes

8.1.1 Progress at the Australian Institute of Health

The establishment of the Australian Institute of Health and its development to the end of 1987 were described in *Australia's health* 1988 (AIH 1988a). Previously, there had been a range of organisations working on health statistics, but their efforts were largely uncoordinated. There was no effective process for setting priorities for national health statistics, and much of the available information was fragmented and lacked standardisation.

The Institute's principal function is the development and coordination of national health statistics. Its success in improving the quality and extending the availability and range of these statistics depends largely on its capacity to provide leadership to the wide range of agencies involved and to coordinate their health statistical activities.

In March 1988, the Dental Statistics and Research Unit (DSRU) was established as an external unit of the AIH within the Faculty of Dentistry at the University of Adelaide. It is developing statistics on the dental labourforce and on dental health status.

A National Injury Surveillance Unit (NISU) has been established as an external unit of the AIH to carry on the work of the National Injury Surveillance and Prevention Project in developing statistical collections related to injury. NISU will also monitor and evaluate activities funded under the injury component of the National Better Health Program.

8.1.2 Collaboration with the Australian Bureau of Statistics

The Institute, in addressing the statistical functions set out in its Act, has developed a close association with the Australian Bureau of Statistics, which looks to the Institute to assist it in developing its health data collection activities. In pursuing its role of analysing data relating to health policy, the AIH will continue to produce special reports based on ABS data.

An example of this collaboration is the development of an inventory of health data sources, which builds on earlier work done separately by the two organisations. The inventory, which will identify and describe all major health data collections in Australia, will be updated regularly. It will provide researchers, administrators and planners in health with a guide to current and recent data collections, and help identify data gaps and deficiencies.

A sound working relationship has been established between the AIH and the ABS. The Australian Statistician is a member of the AIH Board and the Chairman of the AIH Board is a member of the Australian Statistics Advisory Council. ABS and Institute staff maintain close contact through regular meetings, where matters of common interest are reviewed and proposals to improve coordination and liaison are developed.

8.1.3 Review of health statistics

The ABS has reviewed health statistics as one of a series of 10 reviews covering statistics relating to individuals, families and households. The aim of the reviews was to define ABS directions over the next three to five years and to clarify ABS work in relation to the statistical activities of other Commonwealth, State and Territory agencies.

The health statistics review examined the major collections of all agencies providing data at national and State levels, not just ABS collections. The categories covered were:

- Mortality
- Sickness and disease
- Risk factors associated with death, sickness and disease
- Disability
- Occupational health and safety
- Health of specific population groups (eg women)
- Provision and use of health services
    - Services of health professionals
    - Institution based services
- Health finance
    - Expenditure
    - Mechanisms for payment

Each category was examined in relation to user requirements, current statistical output, unmet demand, agency responsibility, and cost of satisfying the unmet demand.

Comments on the review were sought from a range of users at the Federal and State levels, and a draft report will be submitted to the Australian Statistics Advisory Council. It will be used to frame the ABS forward work program, and help the National Committee on Health and Vital Statistics determine priorities in health statistics.

8.1.4 National Committee on Health and Vital Statistics

The National Committee on Health and Vital Statistics, which was created by the Australian Health Ministers' Conference in 1976, became a committee of the Institute in 1987. The Committee reported jointly to AHMAC and the AIH for two years. (AIH 1989a).

The Committee was reconstituted in July 1989 and its functions largely confined to the identification of health statistical needs and priorities. The development, coordination and other functions included in the terms of reference of earlier Committees will be addressed by task–specific Institute working groups.

The new NCHVS terms of reference are:

- to identify the needs for national health related statistics; and
- having regard to the resource implications, to recommend on priorities for developing national health related statistics.

The Committee, which meets twice a year, is to hold a National Health Statistics Forum in February 1991 as part of the process of recommending priorities for national health statistics.

8.1.5 National Centre for Epidemiology and Population Health

The first director of the National Centre for Epidemiology and Population Health (NCEPH) at the Australian National University assumed office in January 1989. By the beginning of 1990, the NCEPH was well advanced in developing its academic program of health development research and training for research in:

- public health;
- health of older people;
- AIDS epidemiology;
- injury prevention;
- cancer and heart disease prevention; and
- prevention of drug abuse.

NCEPH is also developing an international program on health transition to examine social and cultural determinants of mortality and fertility change in developing countries.

There is close collaboration between NCEPH and the AIH, including a common seminar program and the joint appointment of a behavioural epidemiologist. It is anticipated that NCEPH researchers will assist in interpreting and analysing various data sets collected by the AIH.

8.1.6 Public Health Research and Development Committee

The Public Health Research and Development Committee (PHRDC), one of the major committees of the National Health and Medical Research Council, was established in 1987 to encourage development of research in public health. It has done so by funding research, including commissioned research, and by funding training awards. Much of this funding has led to greater use of existing statistics and, to a lesser extent, to development of health statistics.

The PHRDC awarded its first grants in 1988. In 1989, it awarded 10 project grants for research into nutrition, the prevention of cardiovascular disease and the prevention of accidents and injury. In addition, small seeding grants were offered to initiate studies of quality of life scales, measures of lifestyles, scales of social class and the costing of health services. Two large development program grants were awarded to established research centres for multidisciplinary studies and advanced training in public health research. Seven new public health training scholarships and 11 fellowships were provided in 1989, while four workshops were funded to identify research and training needs in evaluation, chronic disability, social science methodology and community participation in public health research.

8.1.7 Statistics for health promotion

The emphasis in health policy has moved in recent years towards prevention, and the promotion of healthy lifestyles and healthy working and social arrangements.

This approach to public health has been embodied in two major recent reviews of health in Australia: *Looking Forward to Better Health* conducted by the Better Health Commission in 1986; and the AHMAC Health Targets and Implementation Committee's *Health for All Australians* in 1988.

These reviews led to the establishment of the National Better Health Program (NBHP), which is a joint responsibility of the Commonwealth and the States and Territories. The program aims to improve the health status of all Australians, particularly those in disadvantaged groups, through health promotion and the reduction of preventable illness, disability and premature death. Five priority areas for action have been identified: injury, nutrition, hypertension, preventable cancers and the health of older people.

As part of the development of the NBHP, the Institute has collated and assessed available statistics relating to the program's goals and targets, and identified gaps and deficiencies for monitoring purposes. Some of this work is reported in Chapter 4 of this publication.

Work is proceeding on developing proposals for the evaluation of the NBHP as well as for the minimum data system required to monitor and evaluate it.

8.2 Developments relating to individual collections

8.2.1 Hospital and Institutional Services

Developments in this area include:

National minimum data set (NMDS) for institutional services

The Institute was funded by AHMAC to develop a national minimum data set for institutional services in collaboration with Commonwealth, State and Territory health authorities. At its June 1990 meeting AHMAC endorsed the adoption of the NMDS (Australian Health Ministers' Advisory Council National Hospital Statistics Project 1989a; 1989b). When implemented, the data set will provide a basis for the collection of uniform statistics on Australia's health institutions. Collection and publication of this information will fill a major gap in Australian health statistics.

Hospital utilisation and cost studies

The first comprehensive study of hospital utilisation and costs since 1980 looked at the 1985–86 financial year (Harvey and Mathers 1988; Mathers and Harvey 1988; Renwick et al 1989; Gillett and Harvey 1989). The AIH has been asked by AHMAC to undertake second and third studies, covering financial years 1987–88 and 1989–90.

National survey program

AHMAC has asked the AIH and the ABS to develop a proposal for a national survey program to cover the major institutions in the public and private sectors.

Casemix information systems

As part of the Medicare Agreements, the Commonwealth has provided $5 million a year to assist State and Territory health authorities to develop and implement, by 30 June 1993, information systems which will give an accurate description of the types of patients treated in hospitals and of the costs associated with treating them. Such systems have the potential to improve significantly the capacity of hospital and other health administrators to manage resource usage. A National Casemix Advisory Unit, funded by the Commonwealth Department of Community Services and Health, has been established at the AIH.

Survey of day surgery facilities

The Commonwealth Department of Community Services and Health has developed an annual survey of all approved day surgery facilities to provide information on age, sex and insurance status of patients and on the surgical procedures performed in these facilities.

The number and use of day surgery facilities has been increasing. At 30 June 1987 there were 10 day surgery facilities, a year later there were 15 and two years later there were 27.

8.2.2 Health labourforce

There have been some steps towards improving the availability, range and quality of data on Australia's existing and potential health labourforce.

National core health labour force data set

The AIH is developing a national health labour force dataset for each health occupation. The national set is a set of items (variables) defined and worded in a standard way, which is to be collected through the annual reregistration processes of the State and Territory professional registering authorities.

The initial focus is concentrated on negotiating an agreement with the nurse and medical registering authorities and State and Territory health authorities. After approaches to the AIH by the pharmacy and podiatry registering authorities and professional associations, negotiations have begun on the dataset for these occupations.

Other registered health occupations will be addressed systematically. The data set for dentistry is being separately coordinated by the AIH Dental Statistics and Research Unit.

Annual publication of information derived from the national dataset for each health registered health occupation will provide up-to-date statistics that are comparable across all States and Territories. This information can satisfy a number of user requirements, including the need for regular monitoring of the health labour force.

ABS surveys

The ABS conducted two surveys related to the health labourforce in 1989.

Career Paths of Qualified Nurses surveyed a sample of people aged 15 to 64 who ever qualified as either registered or enrolled nurses. It describes demographic and other characteristics and work patterns of qualified nurses (ABS 6277.0).

How Workers Get Their Training surveyed a larger sample of people and focused on the educational profiles, study and training activities (both work related and other) undertaken in the year previous to the survey. The survey provides information on employer contribution to training, individual contribution to skill attainment, and the various ways in which skills and knowledge are acquired (ABS 6278.0).

8.2.3 General population-based surveys of health

A number of significant health surveys of the general population have been conducted and more are being developed.

ABS Series of National Health Surveys

The ABS commitment to conduct a series of five-yearly National Health Surveys is a major contribution to national health statistics. Surveys in this series will provide national benchmark information on a range of health issues, and enable trends over time to be monitored. They represent a unique and major component of the Australian health statistics systems.

The first survey in this new series, conducted during 1989 and 1990, will provide information about the health status of Australians, their use of and needs for health services and facilities, and health related aspects of lifestyle.

Risk Factor Prevalence Survey, 1989

The third of the National Heart Foundation Risk Factor Prevalence Surveys was conducted in 1989. This series of three cross-sectional surveys spans the nine years 1980 to 1989 and constitutes the National Risk Factor Prevalence Study.

The study will assist in identifying the reasons for Australia's decreasing heart disease death rates. It is examining changes in risk factor prevalence over the nine years and comparing coronary risk among population centres and social sub-groups. The Institute will be the principal agency responsible for analysing trends over the three surveys.

Iron status of Australians

Participants in the 1989 Risk Factor Prevalence Survey also contributed a blood sample for biochemical determination of their iron status. Plasma samples were analysed for iron, ferritin and transferrin which together provide an indicator of iron deficiency. The survey provided the first national data base on iron status of adults. It complements similar data collected on schoolchildren in 1985 (English and Bennett 1990).

Survey of disability and ageing

In 1988, the ABS conducted a national survey of ageing and disabled people. The survey aimed to update information collected in a 1981 survey on the numbers and characteristics of people with disability. It also addressed the important issues of the care required by and provided for aged and handicapped people living in private domestic situations.

8.2.4 Dental health

Child Dental Health Survey

Information on the dental health of Australian children has been collected on a national basis since 1975, when the Child Dental Health Survey was initiated as part of the evaluation of the Australian School Dental Scheme. Since then there has been an increase in the coverage of the survey. There has been a significant reduction in the dental caries experience of children requiring changes to the type of information collected and to its presentation.

A meeting in November 1988 of representatives of all School Dental Services examined proposals for the survey's aims, methods and reporting. The results were incorporated into the draft *Redesign of the Child Dental Health Survey* (AIH Dental Statistics and Research Unit 1988) and circulated to all States and Territories in February 1989. The aims of the revised survey, now conducted by the AIH DSRU, are to:

- maintain the existing time series of data;
- expand the public health utility of the survey by including relevant demographic variables;
- increase the efficiency of the collection through greater use of sampling strategies, and use of optical mark reading technology;
- improve both the frequency and quality of reporting; and
- produce more rigorous and detailed statistical analyses.

By October 1989, New South Wales and both Territories had undertaken training programs for all staff and begun data collection. Data from these areas are being sent to the DSRU for processing and analysis. Other States are assuming responsibility for processing and will forward unit record data for incorporation into the national data base.

National Oral Health Survey, 1987–88

In 1987–88, a National Oral Health Survey was conducted by Commonwealth and State/Territory health authorities to determine the oral health status of the community and the impact of oral health changes on dental services, education and the labour force.

A detailed analysis and report of this survey, which is the first of its kind to be conducted in Australia, has been prepared by Professor Peter Barnard of the Department of Preventive Dentistry at the University of Sydney, and is expected to be published in 1990.

Participation and productivity of dentists

An Australia–wide survey by the AIH Dental Statistics and Research Unit examining the participation and productivity of dentists was conducted from October 1988 to February 1989. It included a five–year follow–up of dentists covered in an earlier 1983 survey as well as dentists not registered in 1983. The survey will develop a longitudinal picture of participation and productivity and will be valuable in anticipating future changes.

8.2.5 Occupational health

Employment injuries are a major public health problem and a concern of governments. Worksafe Australia has been focusing on the development of national statistics on work injuries. The first stage of this task has been the development of a national data set for the workers' compensation–based collections administered by State, Territory and Commonwealth agencies. Specification of the data set is complete. Work is now proceeding on further development of its elements and, with the agencies, on its implementation.

An Occupational Health and Safety Statistics Coordination Group has been formed between the ABS, Worksafe and the AIH. Its aims are to exchange information, keep a watching brief on developments in occupational health and safety statistics, identify areas of common interest and facilitate required coordinated action.

8.2.6 Injury

Injury, which is a major and preventable health problem, has been identified as one of the five priority areas of the National Better Health Program (Chapter 4).

The three–year National Injury Surveillance and Prevention Project pilot study was a major initiative in the injury statistics field. It investigated the feasibility of collecting information on injuries treated at accident and emergency departments of hospitals. Previously, little information was available on the high frequency and often low severity injuries sustained in the home, at school, during sporting activities, etc. NISPP provided valuable data addressing ways of preventing such injuries.

Plans are now well under way to implement an on–going surveillance system in a range of health care centres in all States and Territories. The resulting data will be used to develop, monitor and evaluate NBHP initiatives. The new AIH National Injury Surveillance Unit will coordinate these efforts and build upon the foundations laid by NISPP.

To complement this activity, the AIH, the Commonwealth Department of Community Services and Health, the ABS, the Federal Office of Road Safety, Worksafe and the Victorian Injury Surveillance System are collaborating to improve the availability, range and quality of coroners' data on injury deaths.

8.2.7 Aboriginal health

The long recognised need for data on Aborigines in health collections was reaffirmed in the report of the National Aboriginal Health Strategy Working Party (1989).

The report was prepared at the request of a 1987 joint meeting of Ministers for Health and for Aboriginal Affairs from the Commonwealth and all States and Territories. Strategies for implementation of the report's recommendations, including those for statistics, have been developed and are awaiting consideration by Ministers.

In the meantime, after representations by the 1984 Task Force on Aboriginal Health Statistics, all State and Territory Governments have included questions on Aboriginality in some statistical collections relating to health. As a result, information on Aboriginal births, perinatal events, hospital admissions, and cause of death is becoming available. However gaps remain in some areas.

The ABS, in collaboration with the AIH and relevant State and Territory agencies, is evaluating the quality and coverage of data relating to Aboriginal births and deaths. A report on the quality of data on Aboriginal births and deaths registered in South Australia in 1988 including a summary of that data has been published by the ABS in conjunction with the Aboriginal Health Organisation of South Australia Incorporated (Hampton and Rogers 1990). The eventual aim is for ABS to publish national Aboriginal vital statistics data.

The ABS 1989–90 National Health Survey includes a question to identify Aboriginal people, the first time the ABS has provided for Aboriginal identification in a health survey.

8.2.8 National Cancer Statistics Clearing House

Establishment of the National Cancer Statistics Clearing House had been delayed because of concern by some States about the confidentiality provisions of the AIH Act. The Act has been amended and progress is expected in 1990.

In the meantime, preventable cancers have been identified as one of the five priority areas of the NBHP. Data on service delivery, economic, behavioural and social aspects of screening programs for breast and cervical cancer is being collected from a range of pilot projects as part of the comprehensive evaluation of cancer screening being coordinated by the AIH Screening Evaluation Coordination Unit.

8.2.9 National Death Index

The establishment of the National Death Index also has been delayed because of concerns by some States about the confidentiality provisions of the AIH Act, but again, progress is expected now that the AIH Act has been amended.

Once established the National Death Index will yield considerable savings in time, expense and effort by enabling epidemiologists to determine readily whether subjects of their research have died and, if so, the State or Territory holding the relevant death record.

Development and operation of the Index will be a cooperative arrangement among the State and Territory Registries of Births, Deaths and Marriages, the ABS which codes causes of death, and AIH. The development will be a complex task, but establishment of the Index will be a significant milestone for epidemiological health research in Australia.

8.2.10 Drug abuse

A National Drug Abuse Data System is being developed to support the initiatives of the National Campaign Against Drug Abuse. The data system draws from a range of information sources including both statistical collections and ad hoc surveys. Its specific aims are:

- to identify and describe the extent and nature of drug use and drug–related problems in Australia;
- to identify and describe responses to such problems:

- to determine factors associated with drug-related problems and responses to them;
- to provide information which will facilitate the development and implementation of policies and programs focussed on the prevention and reduction of drug-related problems; and
- to monitor and assess the impact of policies and programs aimed at improving responses to drug-related problems in Australia.

8.2.11 Use of prescription drugs

The Pharmaceutical Benefits Advisory Committee has established a Drug Utilisation Subcommittee (DUSC), which is exploring how a picture of total pharmaceutical drug use in Australia can be obtained. This involves obtaining data on private prescription use and on drug use in hospitals. In 1990, the AIH helped the Society of Hospital Pharmacists of Australia conduct a survey of cardiovascular drug use in Australian hospitals. The DUSC is examining the results of the survey.

8.2.12 Home and community care

As part of the Home and Community Care Program, a national data collection providing summary information on the number of people assisted by the program and the extent of assistance received from each type of service has been developed to provide a picture of the supply and services to the community.

8.2.13 Communicable diseases

The Communicable Diseases Network–Australia is being established as part of an initiative to improve the surveillance and control of communicable diseases in Australia. The network will comprise Communicable Diseases Units of State and Territory health authorities, the Communicable Diseases Section of the Commonwealth Department of Community Services and Health, participating microbiology laboratories, medical organisations such as the Royal Australian College of General Practitioners, NCEPH and the AIH.

The network's charter is to improve and coordinate communicable diseases surveillance and control nationally. A coordinating group has been set up in the DCSH to improve the flow of information among States and Territories and to provide a vehicle for assisting them in communicable disease outbreaks.

Another major objective of the Network will be training of public health professionals. The existing publication *Communicable Diseases Intelligence* will continue to play the major role in communications within the Network.

8.2.14 National Centre in HIV Epidemiology and Clinical Research

A national registry of AIDS cases has been maintained by the Centre since the beginning of the epidemic and analyses have been published regularly. The major development in related statistics in the two years under review was the establishment of a national data base of new cases of HIV infection, whether relating to a person with AIDS or not.

When the database was established, cumulative counts to June 1989 were obtained, although data on sex, age and transmission category were not available in all cases.

Since then, counts of new diagnoses have been obtained and published every four weeks for all areas except New South Wales. Steps are being taken to complete coverage of this collection.

8.2.15 Assisted conception

National data on in-vitro fertilisation (IVF) and other types of assisted conception have been collected since the early 1980s by the AIH National Perinatal Statistics Unit and the Fertility Society of Australia. A report in 1988 provided summary of treatment cycles and laboratory procedures relating to IVF and gamete intra-fallopian transfer (GIFT) in 25 centres treating infertile couples in Australia and New Zealand. The report also included the cumulative experience of pregnancy outcome in the decade since these methods of assisted conception were introduced. A policy restricting the number of embryos transferred during from IVF resulted from the findings of a high perinatal death rate among multiple births. The data have been used also for studies of birth defects occurring after assisted conception.

8.3 Gaps in health statistics

8.3.1 Organisational gaps and deficiencies

Despite the many advances in improving Australia's national collections of health statistics, there are still many gaps. Much of the available health statistics is fragmented (reflecting the diverse agencies involved) and not comparable between sources.

There is a need to standardise data to maximise its potential, perhaps by developing a standard set of socioeconomic and demographic questions for inclusion in all health collections; published data could then be related to the same denominators. Another possibility is the development of sets of health and disability questions for inclusion in non-health collections.

There is also a need for a better conceptual framework for health statistics where health is considered in the context of physical and social environments. It should also be regarded, in accordance with the WHO concept, as a positive state which includes social and emotional well-being, and not just the absence of illness. Both proposals require development of appropriate indicators. These indicators must be sensitive to the needs of various groups at whom programs might be targeted and to the social and physical environments in which deprivation and inequity influence health.

The National Women's Health Policy (Commonwealth Department of Community Services and Health 1989) identified just such a deficiency in health statistics and the organisation of health services for women. Without an understanding of the way social and enviromental factors interact to influence women's health, their ill health cannot be effectively prevented or managed.

The lack of national information on mental health is a recognised gap in the nation's health information. AHMAC has asked the

Australian Institute of Health to develop a national mental health data strategy, taking account of community based services as well as those provided through institutions. The national minimum data set for institutional health services, which includes both psychiatric inpatients and non-inpatients, is a first step towards developing a national information base on mental health.

There is a need to develop health indicators of relevance to the needs and concerns of disadvantaged groups. With income, for example, the proportion of the population with incomes below a particular level is a more sensitive indicator of deprivation than any indicator based on average income. This development will take some time and require close collaboration of agencies and individual experts.

Health status

More complete national statistics on incidence and prevalence of disease and disability are required. Information on the level and patterns of disease and disability and trends will assist planning, implementation, monitoring and evaluation of health programs and policies. This need will be met by the ABS series of National Health Surveys.

A parallel regular national physical examination survey is also needed to provide objective measures of health status and health risk factors in conjunction with interview data.

While some information is available, diet and nutrition have been identified as important subjects where we need to know more. Ideally, information is required on both the amount and types of food consumed over a given period of time (ie consumption data) as well as on a range of behavioural data on general dietary habits, changes in dietary habits over time and the use of dietary supplements. Some questions on changes in dietary habits were included in the ABS 1989–1990 National Health Survey, but the collection of food consumption data poses significant measurement problems.

With increasing attention on the impact of an ageing population on Australian society generally and the health care delivery system in particular, the requirement for regular surveys on disability and ageing needs to be addressed. Such surveys should provide functional and quality of life measures for the disabled and aged as well as data on needs, circumstances and nature of care and carers.

While there has been some progress in the inclusion of Aboriginal identifiers in health collections, more needs to be done to have them in place in all collections and to ensure quality data are produced. The development of the ABS National Health Survey has highlighted the need for a survey which focuses on the health and social conditions of Aborigines. Although some national estimates will be available from the 1989–90 National Health Survey, the size and distribution of the sample, and the collection methodologies, are inadequate for the production of a detailed set of health indicators for the Aboriginal population.

The ABS health surveys provide insight into the health of the 'general population' but are of limited use for many disadvantaged groups. The ABS is conscious of this shortcoming, one remedy for which might be oversampling of groups of special interest. Another might be collection of more than basic information in subject areas such as education and employment, which impact heavily on health.

Disease registers are an area of health statistics where the value of the information held could be increased if more attention was given to timeliness and quality of information. Unfortunately many registers have been established without sufficient examination of what they should aim to do, or of how they might best be run. The AIH, with the expertise it gains from managing the National Cancer Statistics Clearing House and the National Death Index, should be able to make a major contribution in this area in the future.

Another potential source of information on community morbidity is the Health Insurance Commission (HIC) system of paying benefits for medical services.

Currently the HIC collects no diagnostic information and little other information relating to health. But with more than 80 million consultations with doctors a year there is potential for collecting such information. A number of Canadian provinces collect diagnostic information on claims for medical benefits. The increasing use of computers in doctors' surgeries and the development of networks to serve this market makes the collection of such data increasingly feasible and economic.

Health services

The major deficiencies in statistics of medical and hospital services relate to information on the quality of care provided, on outcomes, and on cost efficiency of services.

For hospital inpatients, problems of non–comparability should be significantly reduced once the national minimum data set is adopted.

For non–inpatient (not admitted) patients of hospitals, the data should improve as a result of adoption of a national minimum data set. However, it will be some time before either diagnosis or patient characteristics are known for this class of patient. This will remain a gap at least until a suitable classification system is developed and implemented. The Casemix Development Program under the Medicare Agreements is funding the development of such systems.

For patients outside hospitals, the picture is mixed. Data about the use of services funded under Medicare is very good, with the postcode of patient providing some rudimentary information about socioeconomic status. The major deficiency is the absence of data on diagnosis and on outcome.

There is a growing demand for statistics for non–medical, non–institutional services, which are the fastest growing area of health services in Australia. For example, there is almost a complete absence of information on services provided through community groups and in the home. There are few good data on people obtaining paid care—their health status, socioeconomic status, or the outcomes of that care. The resources provided voluntarily both in the home and through voluntary community organisations are also poorly known. With much of these being provided by women, and with the increasing participation of women in the labourforce, the need to know about the voluntary health and welfare labourforce will increase.

This chapter deals with just some of the known gaps in national health statistics. The ABS's current review of health statistics and the work of the National Committee on Health and Vital Statistics will provide further valuable insights.

In 1990 the Committee called for suggestions for development of health statistics in Australia. Suggestions should be sent to:

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Glossary

Aboriginal communities The Queensland communities mentioned in Section 2.7.1 are

Aurukun
Bamaga
Bloomfield River
Cherbourg
Doomadgee
Edward River
Hopevale
Kowanyama
Lockhardt River
Mornington Island
Palm Island
Weipa South
Woorabinda
Yarrabah

More recent data from Queensland Aboriginal communities also include Camooweal, Cowal Creek, Thursday Island and Weipa North.

Aborigine/Torres Strait Islander A person of Aboriginal or Torres Strait Island descent who identifies as an Aborigine or Torres Strait Islander and is accepted as such by the community in which he (she) lives (Commonwealth Department of Aboriginal Affairs 1981).

ABS Australian Bureau of Statistics.

acute hospitals *See* hospitals.

acute Having a short and relatively severe course (Dorland's 1965).

ADEC Australian Drug Evaluation Committee.

age specific death rate Number of deaths in a specified period of persons of a specific age group per thousand persons of the same age group.

Age standardised death rate a summary measure which allows comparison between populations with different age distribution, whether the same population over time or different populations at the same time. It is calculated by applying the age–specific death rates for the population being studied to a standard population, calculating the total number of deaths which would occur in the standard population, then dividing this by the total number of people in the standard population to convert it to a death rate.

age specific fertility rate The number of live births to women in a specified age group in one year per thousand women in the same age group (Last 1983).

age standardised Weighted average of age–specific rates according to a standard distribution of age to eliminate the effect of different age distributions and thus facilitate valid comparison of groups with differing age compositions. (Last 1983)

AHMAC Australian Health Ministers' Advisory Council

AHMC Australian Health Ministers' Conference

AHS Australian Health Survey (conducted periodically by the Australian Bureau of Statistics).

AIDS Acquired Immune Deficiency Syndrome.

AIH Australian Institute of Health.

average length of stay The average of the *lengths of stay* for all inpatients. For acute hospitals, a reasonable estimate is obtained by dividing total *bed-days* by *total separations*.

bed–day The occupancy of a hospital bed by an inpatient for up to 24 hours.

billion a thousand times a million

bulk bill A doctor who bulk bills regularly sends the bill for some or all his/her patients direct to Medicare.

capital expenditure Expenditure of a non–recurrent nature (for example, new buildings, equipment used for a number of years).

cardholder Holder of a pensioner health benefit or a health care card. Health care cards are issued to low–income earners — including the unemployed and special beneficiaries and certain recipients of sheltered employment and rehabilitation allowances — entitling them to receive a range of pharmaceuticals at a concessional contribution rate of $2.50 an item. Pensioner health benefit cards are issued to social security and age pensioners on limited incomes, entitling them to receive a range of pharmaceuticals free on prescription, as well as non–health benefits.

Cardiovascular disease Includes stroke, cerebrovascular disease, ischemic heart disease,heart attack, acute myocardial infarction and angina. See Figure 3.6 for more complete explanation.

cholelithiasis The presence or formation of gallstones (Dorland's 1965)

chronic Persisting over a long period (Dorland's 1965).

cohort Group of individuals sharing a statistical characteristic (eg date of birth) who are used in epidemiologic or other statistical studies.

Congalton scale Allocates people to one of four social classes based on the prestige of their occupations.

cost–shared program or project the cost of which is shared by one or more jurisdictions.

crude death rate Number of deaths in a specified period per thousand total population.

cumulative rate Proportion of an initially disease–free group developing a disease over a fixed time interval. (Last 1983).

cumulative rate per cent Cumulative rate expressed as per cent.

cytogenetic The origin and development cells.

dentate Having one or more remaining natural teeth.

diagnosis related group (DRG) A means of classifying hospital patients to provide a common basis for comparing cost effectiveness and quality of care across hospitals. DRGs classify about 460 types of cases encountered in acute hospitals on the basis of principal diagnosis, principal procedure performed (if any), age, sex and other clinical information. Each DRG represents a class of patient requiring similar hospital services.

disability See Box 2.6

DMFT Decayed missing or filled teeth DMFT. See Box 2.8

DSRU Australian Institute of Health Dental Statistics and Research Unit

dysplasic Having abnormality of development.

edentulism The loss of all natural teeth.

epidemic The occurrence in a community or region of cases of an illness, specific health-related behaviour or other health related events clearly in excess of normal expectation (Last 1983)

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 (Last 1983).

episode of care The time between the formal admission to hospital and discharge, transfer to another health institution or death. If a patient is readmitted for further treatment (even for the same condition), a second episode of care occurs. If a patient receives treatment at one hospital and is transferred to another hospital, a second episode of care begins at the time of transfer.

expectation of life Predicted number of years of life remaining to a person if the present pattern of mortality does not change.

female In this volume, female persons of any age.

fertility rate *See* age specific fertility rate.

GAT Geriatric assessment team

handicap See Box 2.6. See also *disability*.

health care Care for the ill. It may or may not include treatment; it does not include *health promotion* or illness prevention.

health maintenance organisation An organisation which accepts contractual responsibility to provide a range of health care services to a voluntarily enrolled population of members in exchange for a predetermined advance payment of a premium by members or a third party (eg government or employer). The amount of payment made by (or on behalf of) each member is not affected by the frequency, extent or kind of health services he or she requires.

health promotion Education to improve health and prevent illness.

health Several definitions are discussed in Chapter 2????.

HIV Human Immunodeficiency Virus, the virus which causes AIDS.

hospital episode – see *episode of care*

hospitals and other health-care institutions

acute hospitals Public hospitals, repatriation hospitals and private acute hospitals which provide services predominantly to inpatients with acute or temporary ailments; the average stay per admission is relatively short.

hostels Residential establishments for older or disabled persons who cannot live independently but do not require nursing care. Hostels may receive Commonwealth subsidies.

nursing homes Institutions which are recognised by the Commonwealth Government and provide long–term care involving regular basic nursing care to chronically ill, frail or disabled persons. In practice they cater mainly for older people. They are owned primarily by private organisations, of which about half are profit seeking. Many receive some form of Commonwealth funding.

private hospitals Privately owned and operated institutions approved by the Commonwealth Department of Health for the payment of a bed–day subsidy during 1985–86 financial year. Private hospitals cater only for private patients who are treated by a doctor of their own choice and are charged fees for accommodation and medical services. Private hospitals can be classified as acute or psychiatric on the basis of the proportion of acute inpatient services provided.

psychiatric hospitals Institutions which provide treatment and care for inpatients with psychiatric, mental or behavioural disorders. In Australia they are almost entirely State operated. Where possible, institutions for non–acute drug dependence, developmental and intellectual disability are excluded from this category. This cannot be done consistently for all States. (See Mathers and Harvey (1988) Volume 2, Section 3.2) for details.)

public hospitals Hospitals controlled by State and Territory health authorities which provide acute care and are listed in Schedule C of the Medicare Agreements. They provide free shared–ward accommodation for all who require it and free treatment there by a hospital–appointed doctor. In addition they provide, to those who are prepared to pay for it (eg through private insurance), private ward accommodation and the doctor of choice. Thus public hospitals service much private medical practice as well as public. There are variations between States in the definition of public hospitals. (See Mathers and Harvey, AIH (1988) Volume 2, Chapter 3.)

publicly funded hospitals In this volume, denotes recognised public short–stay hospitals, repatriation hospitals and public psychiatric hospitals.

repatriation hospitals Acute care hospitals run by the Commonwealth Department of Veterans' Affairs originally set up to provide hospital treatment for eligible veterans and their dependants at Commonwealth expense.

ICD see *International Classification of Diseases*

incidence The number of instances of illness commencing, or of persons falling ill, during a given period in a specified population (Last 1983).

incubation period The time interval between invasion by an infectious agent and the appearance of the first sign or symptom of the disease in question (Last 1983).

infant death Death of an infant within a year of birth.

infant mortality rate Number of infant deaths per thousand live births.

infectiousness A characteristic of the disease that concerns the relative ease with which it is transmitted to others (Last 1983).

inpatient Any person formally admitted by a hospital. Healthy newborn infants are excluded unless they have a stay of more than 10 days, or are the second or subsequent birth in multiple births.

institutional In this volume, adjective denoting the major health care institutions, such as hospitals and nursing homes.

IPD1 deflator Index used to adjust institutional health costs to allow for inflation. It is the ABS implicit price deflator for government consumption expenditure on health, social security and welfare.

International Classification of Diseases (ICD) Major cause of death and principal diagnosis for hospital inpatient episodes are classified according to the International Classification of Diseases, the ninth revision (ICD9) being in current use. The 18 major categories of disease used in the ninth revision are listed in Table 2.3. In this publication, where used in time series, causes of death classified before 1979 under previous revisions of ICD have been reclassified to ICD9 by the AIH.

ischemia Deficiency of blood in a part, because of functional constriction or actual obstruction of blood vessel (Dorland's 1965).

length of stay The difference, in completed days, between the dates of admission and *separation*. Where a patient is admitted and discharged on the same day, the length of stay is taken as one day.

life expectancy See *expectation of life*.

low birthweight Less than 2500 grams.

male In this volume, male persons of any age.

man In this volume, adult male.

maternal direct deaths Deaths resulting from obstetric complications of the pregnant state. See also *total maternal deaths*.

Medicare Benefits Schedule A compilation of the professional medical services which are subject to the payment of benefits by Medicare against expenses incurred by Australian residents. The Schedule is determined by regulation. Known before Medicare as the Medical Benefits Schedule. The Schedule fee is the value for each professional medical service in the Schedule from which the maximum benefit is calculated. The Schedule fee is not a recommended fee nor is it a maximum fee.

morbidity Any departure, subjective or objective, from a state of physiological or psychological well-being (Last 1983).

mortality Death.

NBHP National Better Health Program

NCADA National Campaign on Alcohol and Drug Abuse

NCEPH National Centre for Epidemiology and Public Health

NCHVS National Committee on Health and Vital Statistics

NHMRC National Health and Medical Research Council

NHTAP National Health Technology Assessment Panel

NISPP National Injury Surveillance and Prevention Project

NISU National Injury Surveillance Unit

neonatal Pertaining to or occurring within 28 days of birth

neonatal mortality rate Number of neonatal deaths per thousand live births.

new public health Phrase coined to re–emphasise the impact that the physical and social environment has on public health.

NPSU National Perinatal Statistics Unit.

nulliparous Having never given birth to a viable baby.

nursing home See *hospitals and other health care institutions.*

occupancy rate The ratio of total bed–days in a year to total possible bed–days (where the latter is available beds multiplied by 365).

OECD Organisation for Economic Co–operation and Development, comprises a set of 24 developed countries, including most Western European countries, the United States and Australia.

Over–the–counter drugs (OTCs) Drugs available without prescription. Some OTCs are also listed in the schedules to the poisons acts of the States and Territories and can only be sold under the supervision of pharmacists – these are S–3 drugs. Many OTCs can be sold through non–pharmacy retail outlets. Although there is a general agreement between the Commonwealth, State and Territory governments on the classification and labelling of drugs, many minor differences in scheduling still exist.

pap smear Papanicolaou's test – a procedure for the detection or diagnosis of malignant and premalignant conditions of the female genital tract. (Dorland's 1965)

PBS Pharmaceutical Benefits Scheme.

PHRDC Public Health Research and Development Committee

perinatal Pertaining to or occurring in the period shortly before or after birth.

perinatal death Stillbirths (fetal deaths) plus neonatal deaths.

perinatal mortality rate Number of perinatal deaths per thousand total births.

periodontal Situated or occurring around a tooth.

Prescription drugs Drugs available only on the prescription of a registered medical practitioner. Prescription drugs are also known as Schedule four (or S–4) drugs after the schedule to the State and Territory Acts of Parliament that regulates the sale and distribution of poisons and drugs. Prescription drugs are available only from pharmacists who are also regulated by State and Territory laws whether they work in community pharmacies or in hospital pharmacies.

private health insurance Basic hospital table benefits provide insurance for private inpatients of recognised (public) hospitals, private hospitals and day hospital facilities. Supplementary hospital table benefits provide additional hospital accommodation benefits to cover charges by private hospitals and the extra charge for a private room in a recognised (public) hospital. Membership of a basic hospital table is a prerequisite for membership of a supplementary hospital table.

postneonatal death Death between 28 days and one year of birth of an infant surviving the neonatal period.

postneonatal mortality rate Number of postneonatal deaths per thousand live births.

potential years of life lost (PYLL) Number of potential years of life lost in a population as a result of premature death.

prevalence The number of instances of a given disease or other condition in a given population at a designated time (Last 1983).

private hospital See *hospitals and other health care institutions.*

psychiatric hospital See *hospitals and other health care institutions.*

public health One of the efforts organised by society to protect, promote, and restore the people's health. It is the combination of sciences, skills and beliefs that are directed to the maintenance and improvement of the health of all the people through collective or social actions. The programs, services, and institutions involved emphasize 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 (Last 1983). See also *new public health.*

public hospital See *hospitals and other health care institutions.*

publicly funded hospital See *hospitals and other health care institutions.*

PYLL See *potential years of life lost.*

quality adjusted life years (QALYs) A measure of the outcome of actions (either individual or treatment interventions) in terms of their health impact. If an action gives a person an extra year of healthy life expectancy, that counts as one QALY. If an action gives a person an extra year of unhealthy life expectancy (partly disabled or in some distress), it has a value of less than one. Death is rated at zero.

quality assurance The process of providing, through a range of mechanisms, a credible guarantee that the quality of health services is at an optimum standard in the particular circumstance.

real cost Cost expressed in terms which have been adjusted for inflation (eg in 1984–85 dollars). this enables comparisons to be made between expenditures in different years.

recurrent expenditure Expenditure which recurs continually or very frequently (eg salaries). it may be contrasted with capital expenditure, such as the cost of hospital buildings and diagnostic equipment, for which the expenditure is made infrequently.

relative risk The ratio of the risk of disease or death among the exposed to the risk among the unexposed (Last 1983).

repatriation hospital See *hospitals and other health care institutions.*

risk factor An attribute or exposure that is associated with an increased probability of a specified outcome, such as the occurrence of a disease. not necessarily a causal factor (Last 1983).

risk The probability that an event will occur (Last 1983).

schedule fee see medicare benefits schedule.

SECU Screening Evaluation Coordination Unit.

separation (or discharge) Occurs when an inpatient leaves hospital to return home, transfers to another institution, or dies.

separation rate The number of separations in a year per thousand total population.

sex ratio Number of events occurring to males in the population divided by the number of similar events occurring to females in the same population.

SES Socioeconomic status

STD Sexually transmitted disease.

stillbirth Birth of a fetus weighing at least 500 grams (or where birthweight is unavailable, of at least 22 weeks gestation), which shows no signs of life.

stillbirth rate Number of stillbirths per thousand total births, live and stillborn.

symptom Any functional evidence of disease or of a patient's condition (Dorland's 1985).

Torres Strait Islander See Aborigine/Torres Strait Islander.

total bed–days The sum of the lengths of stay of all inpatients for a given period.

total fertility rate The number of live births a woman would have if, throughout her reproductive years, she had children at the rates prevailing in the reference calendar year. it is the sum of the age specific fertility rates for that calendar year.

total maternal deaths Direct deaths plus indirect deaths (those resulting from pre–existing disease or disease that developed during pregnancy but not due to direct obstetric causes) plus indirect deaths (where pregnancy is unlikely to have contributed significantly to the death).

WHO World Health Organization.

woman In this volume, adult female.

$ Denotes the Australian dollar, unless otherwise indicated.

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