

Table 3.3: Proportion of people who find regular drug use by adults acceptable, 1998 (per cent)

Drug	Males	Females	Persons
Tobacco	41.8	38.6	40.2
Alcohol	67.7	55.1	61.3
Cannabis/marijuana	30.4	20.9	25.6
Pain killers/analgesics ^(a)	10.3	8.8	9.5
Tranquillisers/sleeping pills ^(a)	7.2	3.8	5.5
Steroids ^(a)	3.9	0.9	2.4
Barbiturates ^(a)	2.7	0.7	1.6
Inhalants	1.7	0.3	1.0
Heroin	2.8	0.8	1.8
Methadone ^(b)	2.8	0.8	1.8
Amphetamines	4.7	1.7	3.1
Cocaine	3.8	1.1	2.4
Naturally occurring hallucinogens	6.4	2.2	4.3
LSD/synthetic hallucinogens	4.4	1.5	2.9
Ecstasy/designer drugs	5.1	1.5	3.3

(a) Non-medical use.

(b) Non-maintenance.

Source: 1998 National Drug Strategy Household Survey.

3.4 Lifestyle and behaviour

Dietary behaviour

Australia's Food and Nutrition (AIHW: Lester 1994) described a strong association between dietary behaviour and many chronic diseases. The major causes of death, illness and disability in which diet and nutrition play an important role include coronary heart disease, stroke, hypertension, atherosclerosis, some forms of cancer, type 2 diabetes, osteoporosis, dental caries, gall bladder disease and nutritional anaemias.

Ill health generally cannot be attributed to any one dietary component alone (Ashwell 1997). Diseases associated with diet are also associated with environmental, behavioural, biological and genetic factors. The complex relationships between diet, other risk factors and disease make it difficult to assess the contribution of diet to ill health (AIHW: Lester 1994).

In an optimal diet, the supply of required nutrients is adequate for tissue maintenance, repair and growth. The vitamins, minerals and proteins required to maintain the human body in good health can be met only through the intake of a well-balanced, wide variety of food.

The dietary guidelines for Australians recommend consumption of a wide variety of nutritious food. Essential nutrients for good health are found in varying amounts throughout many different food groups. Variety in a diet maximises the possibility of obtaining enough of these essential nutrients.

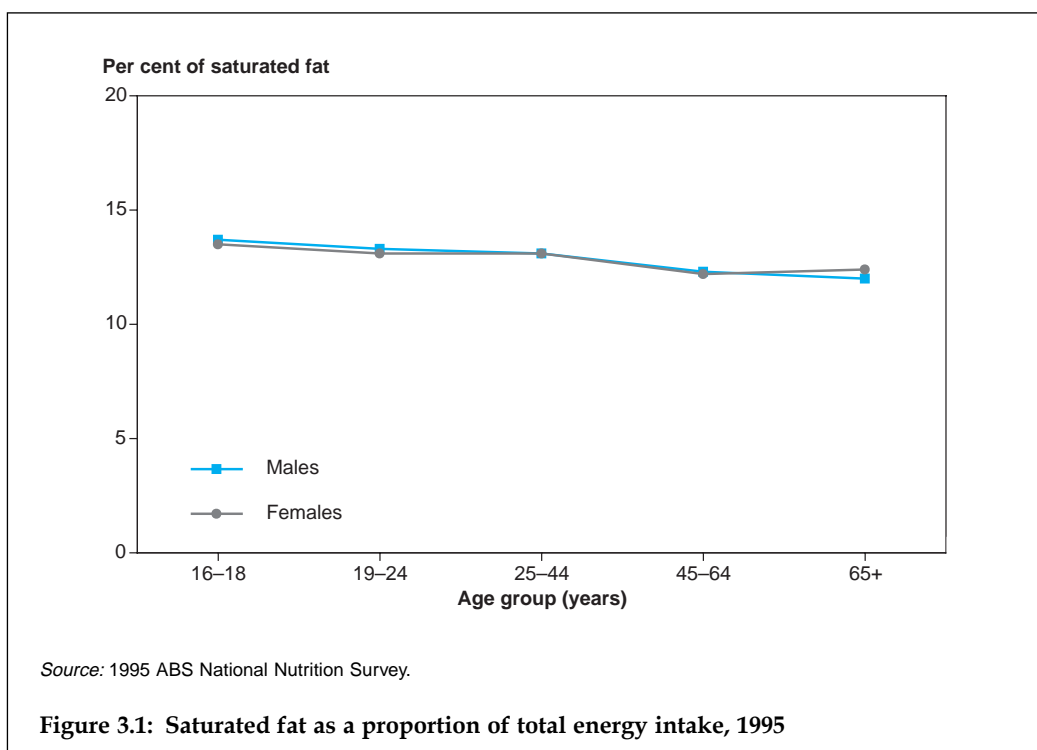
Food variety can be defined as the consumption of foods that are biologically diverse or nutritionally distinct from each other. Data from the 1995 National Nutrition Survey showed that the variety of food consumed in Australia increased significantly during the 14 years since the previous survey.

More than 90% of Australians reported consuming foods from the 'cereal and grains' and 'milk product' food groups in 1995 (ABS & DHFS 1997). However, over half of the males aged 12–44 years and approximately one-third of children aged 4–11 years had not eaten fruit on the day before the interview.

There is increasing evidence that fresh fruit and vegetable consumption offers protection against cancer, coronary heart disease and stroke (Ness & Powles 1997; NHMRC 1992a; Rimm et al. 1996; Steinmetz & Potter 1996). Previously, five serves of fruit and vegetables were recommended daily, but in recent years this has been increased to seven serves per day to obtain the best health benefits (Cashel & Jeffreson 1995).

In 1995, the proportion of people aged over 25 years who consumed less than five serves of fruit or vegetables per day ranged from a low of 46% for women aged 55–64 to a high of 70% for men aged 35–44 (ABS & DHFS 1997).

It is estimated that inadequate fruit and vegetable consumption (less than five serves) was responsible for 3% of the total burden of disease and 11% of total cancer burden in Australia in 1996 (AIHW: Mathers et al. 1999). By comparison, the net harm associated with alcohol consumption in 1996 was around 2.2% of the total burden of disease. The effects of alcohol consumption on health are discussed elsewhere in this chapter.



High intakes of fat, especially saturated fats, are associated with elevated blood cholesterol levels, overweight and increased death from cardiovascular disease in populations where levels of physical activity are low (AIHW 1999c). Total fat (including saturated, mono-unsaturated and polyunsaturated) accounts for about 33% of the total energy intake of Australian adults. Although total dietary fat intake appears to have decreased from about 37% in the 1980s, the current level is still above the NHMRC's recommended level of 30% (NHMRC 1991).

Among Australian adults, saturated fat accounts for around 13% of total energy intake (Figure 3.1), higher than the recommended maximum level of 10% (AIHW 1999c). The major sources of saturated fatty acids in the adult diet are cheese, butter and margarine, pastries, milk and meat (ABS & DHAC 1998).

High salt consumption in some people is associated with an increase in blood pressure and possibly cardiovascular illness and death. No national data exist to assess levels of salt consumption among Australians. However, in one study conducted in Hobart, only 6% of men and 36% of women were below the recommended maximum intake of 100 mmol/day (Beard et al. 1997).

The recommended dietary intake (RDI) is a level of consumption for each nutrient considered to be adequate to maintain good health and prevent deficiency diseases (NHMRC 1991). Australia's mean nutrient intake from food and beverages, reported from the 1995 National Nutrition Survey, was very close to or exceeded the RDI for most vitamins and minerals in all age groups. The exceptions were calcium for females in most age groups and for boys aged 12–15 years, zinc for females aged over 12 years, and magnesium for girls aged 16–18 years (ABS & DHFS 1997). Calcium is important for bone and tooth development and insufficient dietary calcium increases the risk of developing low bone density and osteoporosis (NHMRC 1999). Zinc and magnesium are important for immune function, wound healing and muscle growth (Mann & Truswell 1998).

The evidence linking diet with preventable disease is recognised in Australia and internationally to provide sufficient reason for including improved nutrition as a major component of public health initiatives (AIHW: Lester 1994). The Strategic Intergovernmental Nutrition Alliance (SIGNAL) was established in 1997 as part of a strategic plan to further the implementation of the National Food and Nutrition Policy (DHCS 1992).

Alcohol consumption

Alcohol consumption is associated with considerable mortality and morbidity in the Australian community, accounting for an estimated 3,700 deaths in 1997 and almost 96,000 hospital episodes in 1996–97 (AIHW: Higgins et al. 2000).

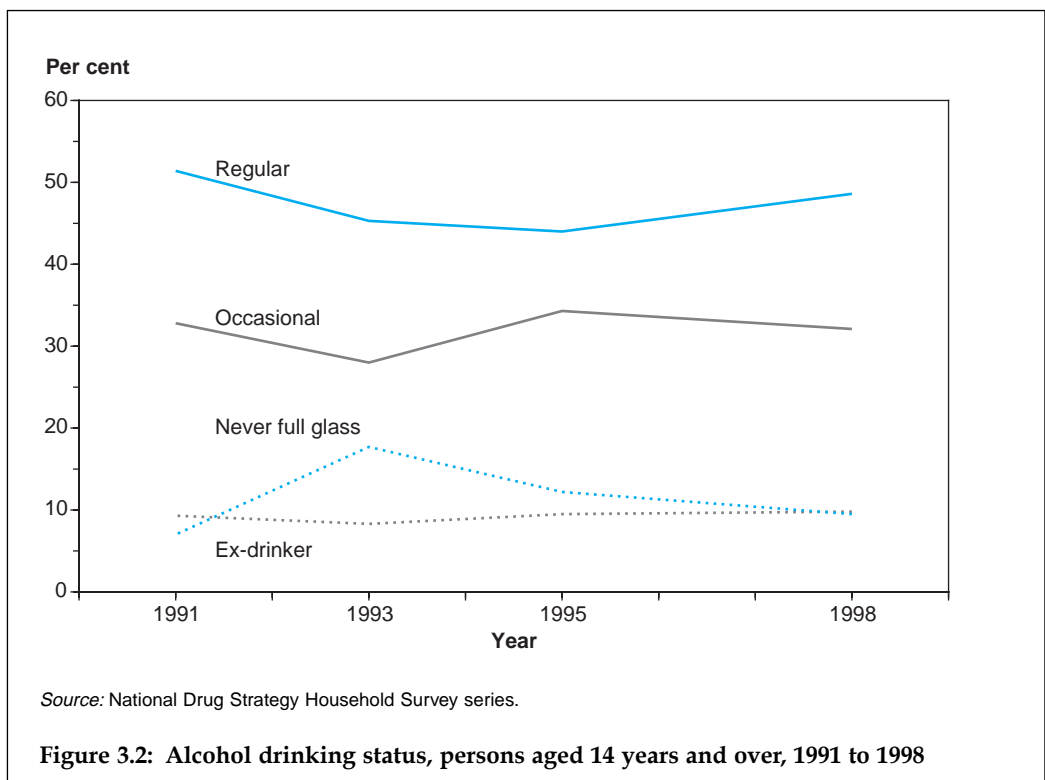
It has been estimated that the harm caused by alcohol consumption accounts for 4.9% of the total disease burden (AIHW: Mathers et al. 1999). Conditions associated with hazardous and harmful alcohol use include some cancers, liver disease, pancreatitis, diabetes and epilepsy. Alcohol is a significant factor in motor vehicle fatalities and injuries, and is associated with falls, drowning, burns, suicide and occupational injuries (English et al. 1995).

However, low to moderate levels of alcohol consumption can protect against hypertension, ischaemic heart disease, stroke and gallstones. The net harm associated with alcohol consumption, after taking into account these benefits, is around 2.2% of the total disease burden. The distribution of harm and benefit varies with age. For both males and females, the harmful burden of disease is highest in the 15–24 years age group, and the greatest protective effect is realised in persons over 75 years of age.

There are also social costs to the excessive use of alcohol. In 1998, over one-third of adult Australians reported being either verbally or physically abused by someone under the influence of alcohol (AIHW 1999a). About 1 in 10 persons reported being the victims of alcohol-related property damage or theft.

Based on results from the 1998 National Drug Strategy Household Survey, about 9 in 10 Australians aged 14 years or more had tried an alcoholic drink at some time in their lives, and around 8 in 10 persons reported drinking in the past 12 months (AIHW 1999a).

Drinking status has remained largely unchanged over the last decade (Figure 3.2), with around 50% of the population aged 14 years and over drinking regularly, i.e. on at least one day per week. A further 30% drank on only a few occasions each month, and the remainder either no longer drank alcohol or had never consumed a full glass of alcohol.



Although the drinking status pattern has remained fairly constant, overall levels of alcohol consumption have decreased. Using apparent consumption data published by the Australian Bureau of Statistics (ABS), consumption of pure alcohol decreased markedly from 9.7 litres per person in 1981 to 8.2 litres in 1991, and then more slowly to 7.6 litres in 1997 (ABS 1998a).

The 1998 National Drug Strategy Household Survey showed that among recent drinkers (in the last 12 months), 14% of males and 6% of females typically consumed alcohol every day of the week (Table 3.4). Based on NHMRC recommendations regarding responsible drinking behaviour (NHMRC 1992b), at least 8% of adult male drinkers and 4% of females usually drank at levels considered to be hazardous or harmful to health (AIHW: Higgins et al. 2000).

Internationally, Australia ranked 19th in 1997–98 for per capita consumption of alcohol (total pure alcohol), at 7.6 litres per person (Productschap voor Gedistilleerde Dranken 1999). This figure is made up from 94.5 litres of beer per person (for which Australia ranked 9th), 19.7 litres of wine per person (ranked 18th) and 1.3 litres per person of pure alcohol from spirits (ranked 35th).

Table 3.4: Alcohol consumption patterns, recent drinkers aged 14 years and over, 1998 (per cent)

Frequency	Quantity (standard drinks)				Total
	1–2	3–4	5–6	7 or more	
Males					
Every day	4	5	3	2	14
4–6 days/week	5	6	3	3	17
2–3 days/week	6	7	4	6	23
1 day/week	3	6	3	4	16
Less often	17	6	2	3	30
Total	36	31	15	18	100
Females					
Every day	4	2	1	—	6
4–6 days/week	6	3	—	—	10
2–3 days/week	9	4	1	2	16
1 day/week	8	4	2	2	17
Less often	35	9	3	2	50
Total	62	22	8	7	100

Note: 'Recent' refers to the last 12 months.

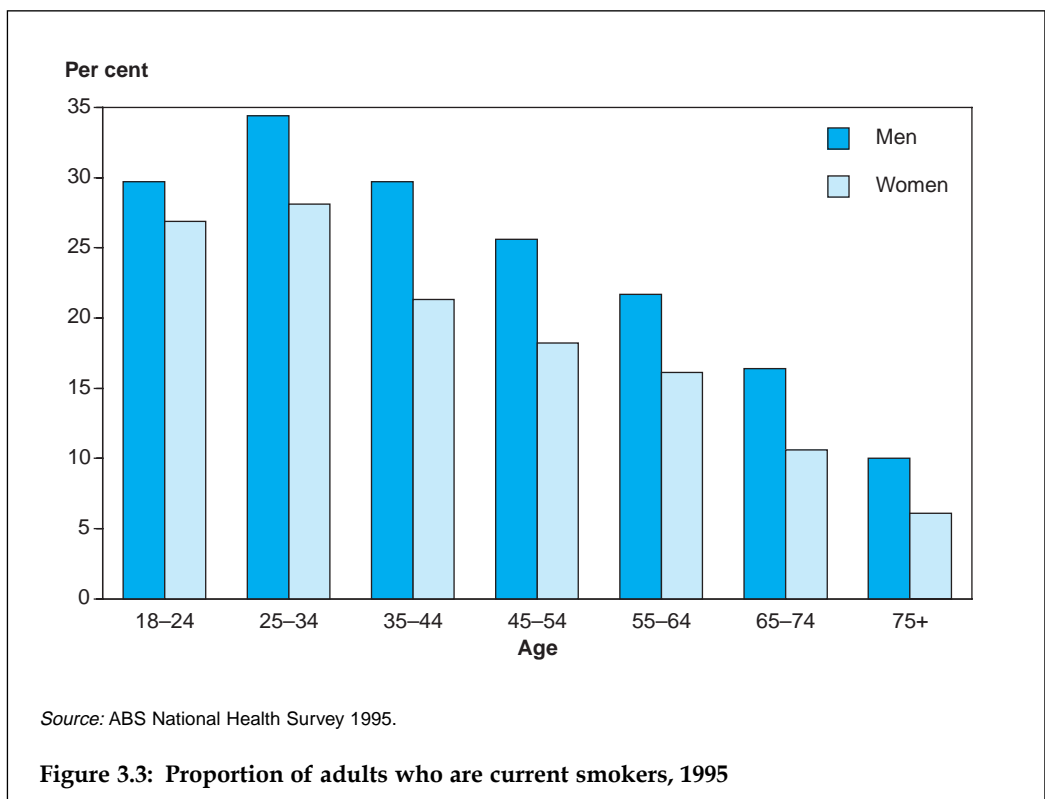
Source: National Drug Strategy Household Survey 1998.

Tobacco smoking

Of all risk factors for disease, tobacco smoking is responsible for the greatest burden on the health of Australians. It is estimated that in 1996 tobacco smoking was responsible for about 12% of the total burden of disease in males and 7% in females (AIHW: Mathers et al. 1999).

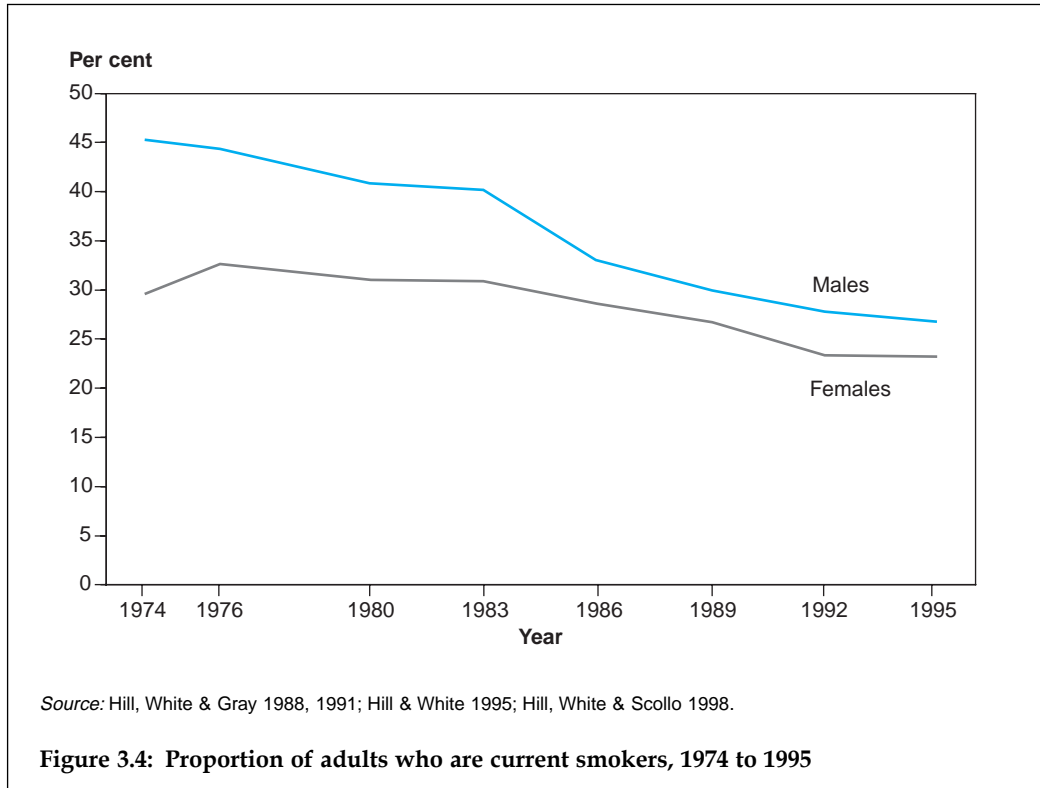
Tobacco smoking increases the risk of coronary heart disease, stroke and peripheral vascular disease as well as a range of cancers and other diseases and conditions. It is responsible for around 85% of new cases of lung cancer annually (DHFS & AIHW 1998). Approximately 13% of deaths from cardiovascular disease and 21% of deaths from cancer are due to smoking tobacco (AIHW 1996). It is estimated that smoking tobacco was associated with almost 150,000 hospitalisations in Australia in 1998 (AIHW 1999a).

From data collected in the 1995 National Health Survey it is estimated that almost 3.2 million adult Australians were at risk of developing heart disease and other chronic conditions from smoking tobacco products (AIHW 1999c). About 27% of men and 20% of women aged 18 years and over were smokers. Highest rates of smoking were found among men (34%) and women (28%) aged 25–34 years. After 34 years of age, the rate of smoking declined with increasing age to be lowest among men and women aged 75 years and over (Figure 3.3).



In 1995, the proportion of ex-smokers in Australia was 32% for men and 23% for women. The proportion of people reporting to have never smoked was 40% for men and 57% for women (AIHW 1999c).

Male adult smoking rates have been declining since the 1960s, while among women smoking rates began to decline in the late 1970s. However, national surveys by the Anti-Cancer Council of Victoria show that the rate of decline of current smokers has slowed in more recent years (Hill, White & Scollo 1998) (Figure 3.4).



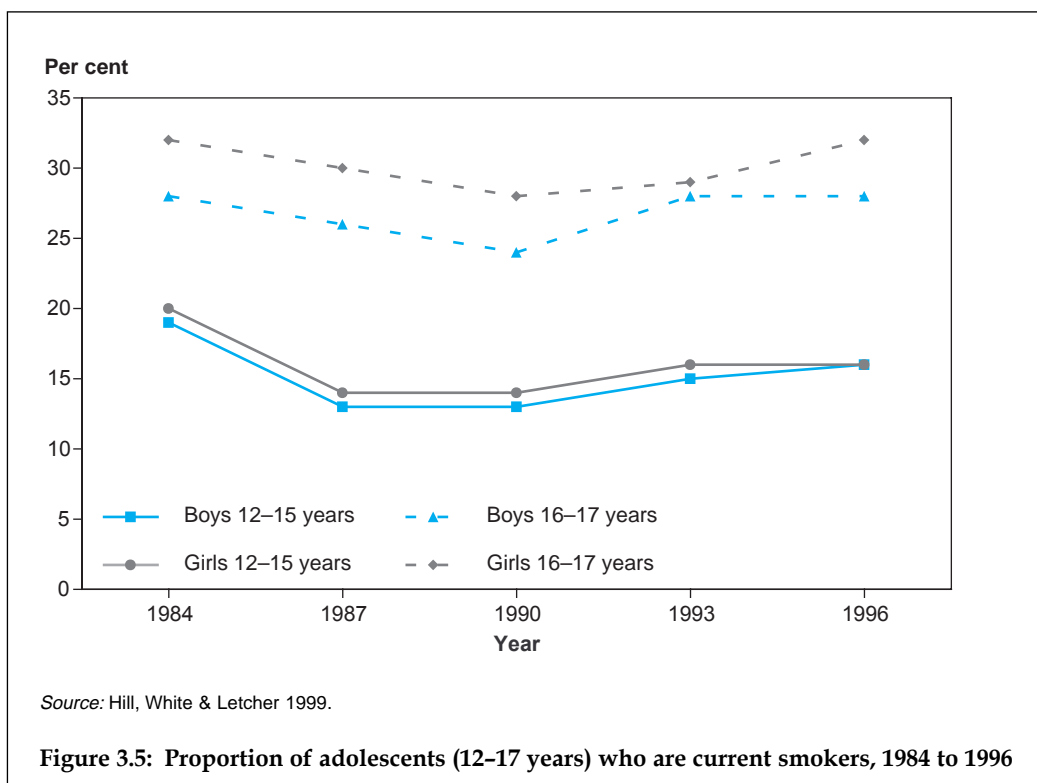
From data collected in a national survey of secondary students, it is estimated that more than 276,000 aged 12–17 years were current smokers in 1996. It has been estimated that approximately 70,000 take up smoking each year (Hill, White & Letcher 1999). The smoking rate for those aged 12–15 years in 1996 was 16% for both boys and girls, with the rate rising to 28% among boys aged 16–17 years and 32% among girls aged 16–17 years (Figure 3.5).

There was a decline in current smoking rates for students aged 12–17 years from 1984 through to 1990, but this decline has since ceased.

The 1998 National Drug Strategy Household Survey (AIHW 1999a) measured tobacco consumption patterns among Australians. The average number of cigarettes smoked per week by adult male and female smokers was 101 and 100 respectively.

The average number of cigarettes smoked per week by teenagers (aged between 14 and 19 years) was 60 for males and 57 for females (AIHW 1999a).

Quality of life is a subjective assessment made by individuals and relates to their functioning across a number of physical and mental health dimensions. Heavy smokers (more than 25 cigarettes per day) have lower quality of life than do light (less than 15 cigarettes per day) or moderate (15–24 cigarettes per day) smokers. Further, all types of smokers have lower quality of life than those who had never smoked and ex-smokers (Wilson et al. 1999).



Use of illicit drugs

Illicit drug use refers to the use of illegal drugs and the illicit use of drugs and volatile substances, including the non-medical use of prescription drugs. Illicit drug use is, directly and indirectly, a significant cause of death and ill health. Conditions associated with illicit drug use include overdose, HIV/AIDS, hepatitis C, low birthweight, infective endocarditis, poisoning, suicide and self-inflicted injury.

Approximately 2% of the total burden of disease in Australia can be attributed to illicit drug use (AIHW: Mathers et al. 1999), with the age-specific burden peaking in the age group 25–34 years.

Data from the 1998 National Drug Strategy Household Survey show that, defined in the above terms, an estimated 3.3 million Australians aged 14 years or more have used an illicit drug in the past 12 months. Most of this use is associated with marijuana/

cannabis (around 2.7 million persons). It is estimated that in 1997, over 800 people died from illicit drug-related causes, and in 1996–97 there were over 11,000 hospital episodes related to the use of illicit drugs (AIHW 1999a).

Although estimates of low-prevalence behaviours are subject to high relative standard errors, it appears that illicit drug use is generally increasing (Table 3.5). An exception is the non-medical use of barbiturates, which is declining, due apparently to increased restrictions on access to this class of drugs. As noted above, marijuana/cannabis use continues to dominate among the drugs surveyed: in 1998 almost two-fifths of the population aged 14 years and over had tried using marijuana/cannabis at some time in their life, and almost one-fifth had used the drug in the past 12 months. Use of this drug in 1998 increased from previous years, and there was an associated increase in community acceptance of its regular use by adults (AIHW 1999a).

Table 3.5: Summary of illicit drug use, persons aged 14 years and over, 1991–98 (per cent)

Substance	Ever used				Recently used ^(a)			
	1991	1993	1995	1998	1991	1993	1995	1998
Amphetamines ^(b)	8	8	6	9	3	2	2	4
Barbiturates ^(b)	(c)	4	1	2	(c)	—	—	—
Cocaine	3	2	3	4	1	1	1	1
Ecstasy	2	3	2	5	1	1	1	2
Hallucinogens	7	7	7	10	2	1	2	3
Heroin	2	2	1	2	1	—	—	1
Inhalants	3	4	2	4	1	1	—	1
Injected drugs	2	2	1	2	1	1	1	1
Marijuana/cannabis	32	34	31	39	13	13	13	18
Pain killers ^(b)	(c)	3	12	12	(c)	2	3	5
Steroids ^(b)	n.a.	3	1	1	n.a.	—	—	—
Tranquillisers	(c)	3	3	6	(c)	1	1	3

(a) Used in the last 12 months.

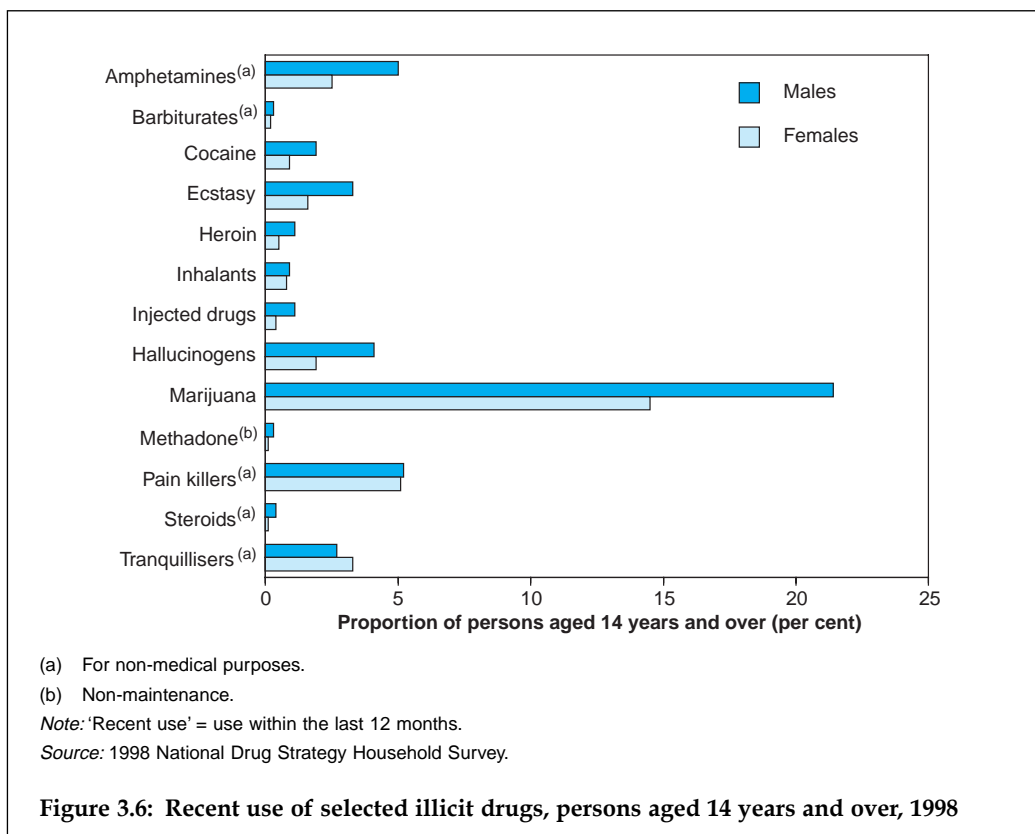
(b) For non-medical purposes.

(c) Data for 1991 not comparable to other years.

Sources: National Campaign Against Drug Abuse Household Survey 1991; National Drug Strategy Household Survey 1993, 1995, 1998.

In 1998, with the exception of tranquillisers, recent use by males exceeded that of females for all the substances included in the survey (Figure 3.6), and this reflected the pattern for lifetime use. However, between 1995 and 1998, illicit drug use among young females (aged 14–19) increased markedly (particularly for marijuana/cannabis), and use of illicit drugs among young males remained relatively stable. This has led to a convergence in the overall prevalence of illicit drug use between young males and females.

Injection of illicit drugs and non-prescribed pharmaceuticals can have significant adverse health effects, including drug overdose, acquiring of blood-borne infections (such as with HIV or hepatitis C virus (HCV)), and other illnesses from the injection of contaminants or impure substances. It is estimated that there were around 108,000 injecting drugs users in 1998 (AIHW 1999a).



In a 1998 survey of injecting drug users who visited needle and syringe exchanges, 2% tested positive for HIV antibodies and 49% of the surveyed users tested positive to the HCV antibody. Prevalence of the antibodies is highly correlated with the length of injecting drug-use history (Table 3.6).

Table 3.6: Prevalence of HIV and HCV antibodies among injecting drug users^(a), 1998 (per cent)

History of injecting drug use	Tested positive to HIV antibody			Tested positive to HCV antibody		
	Males	Females	Persons	Males	Females	Persons
Less than 3 years	1	1	1	15	20	17
3 to 5 years	2	—	1	25	34	29
6 or more years	2	1	2	63	73	66
Not reported	3	—	2	49	55	52
Total	2	1	2	47	53	49

(a) Survey of users attending 32 needle and syringe program sites.
Source: NCHECR 1999.

Using data from the National HIV Database, approximately 8% of HIV diagnoses in Australia have been in people with a history of injecting drug use, of whom half were men who also reported homosexual contact (NCHECR 1999).

Physical inactivity

Physical inactivity is a major determinant of ill health and the effects of physical activity on reducing the risk of mortality from all causes are well documented for people at all life stages (Mensink et al. 1999). According to recent estimates, physical inactivity is responsible for about 7% of the total burden of disease in Australia (AIHW: Mathers et al. 1999).

Studies show that participation in physical activity is associated with the prevention of cardiovascular disease. People who do not participate in regular moderate physical activity are about twice as likely to suffer a cardiovascular condition compared with those who participate (Blair et al. 1996).

Physical inactivity is associated with other risk factors for cardiovascular disease such as overweight, high blood pressure and high blood cholesterol. People who increase their levels of physical activity will reduce their levels of these risk factors (Bauman & Owen 1999; United States Department of Health and Human Services 1996).

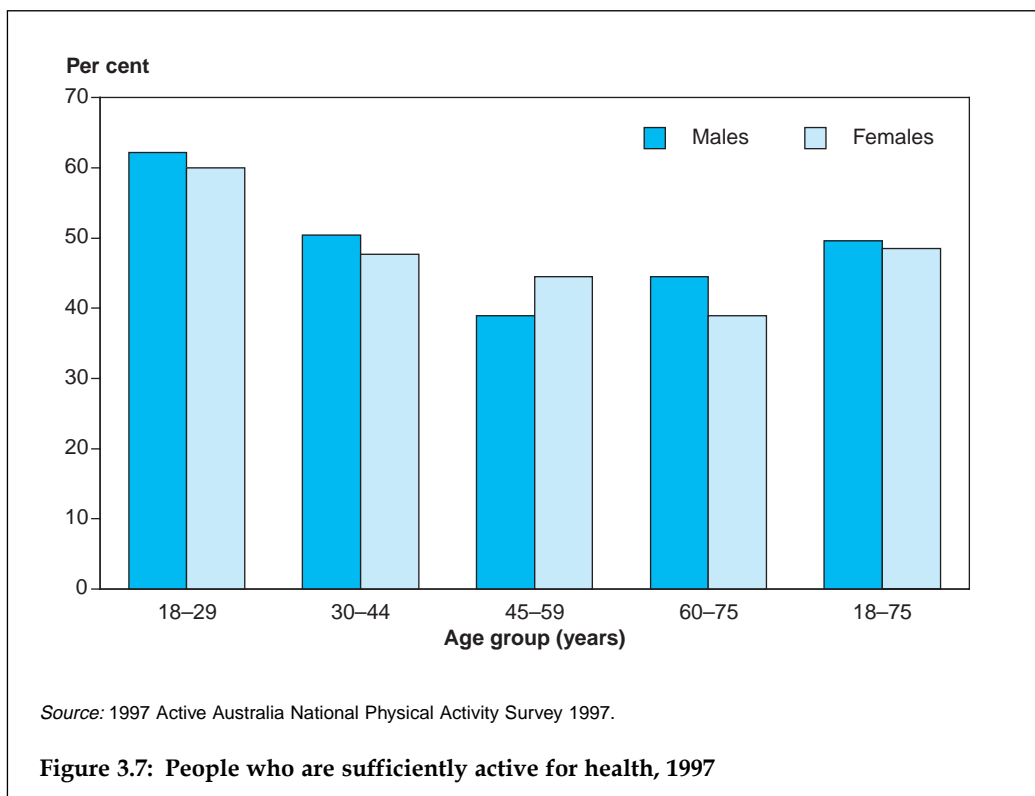
Participation in physical activity reduces the risk of developing colon cancer (Martinez et al. 1997), and emerging evidence suggests it provides a protective effect for breast cancer, especially among postmenopausal women (Sesso et al. 1997), and for lung cancer (Lee et al. 1999).

Participation in physical activity is associated with a reduced risk of developing diabetes (Hu et al. 1999) and improvements in musculoskeletal health. Further, studies have shown the benefits of physical activity on mental health (Chen & Millar 1999).

Currently, no nationally accepted uniform procedures exist for the collection and analysis of data on physical activity in Australia. The development of an appropriate tool to measure the physical activity among populations is a challenging task. Physical activity (any bodily movement produced by skeletal muscles that results in energy expenditure) for health benefit comprises several components (e.g. intensity, frequency, duration) that can be carried out in different settings (e.g. leisure time, occupational, transport). Measurement is further complicated because there are several dimensions of physical activity related to health such as energy expenditure, aerobic intensity, strength and flexibility. For example, physical activity for the prevention of cardiovascular disease is different from that required for prevention of musculoskeletal problems.

The 1997 Active Australia National Physical Activity Survey indicated that 50% of men and 49% of women aged 18–75 years undertook physical activity at a level which was beneficial to health. This level was defined as participation in at least 150 minutes activity of at least moderate intensity, spread over five sessions per week. In general, physical activity levels decline with increasing age (Figure 3.7).

The National Health Survey shows that the proportion of people doing no physical activity during their leisure time decreased only slightly between 1989–90 and 1995 from 36% to 34%. This decline was due mainly to an increase in physical activity among people aged 35–54 years (AIHW 1999c).



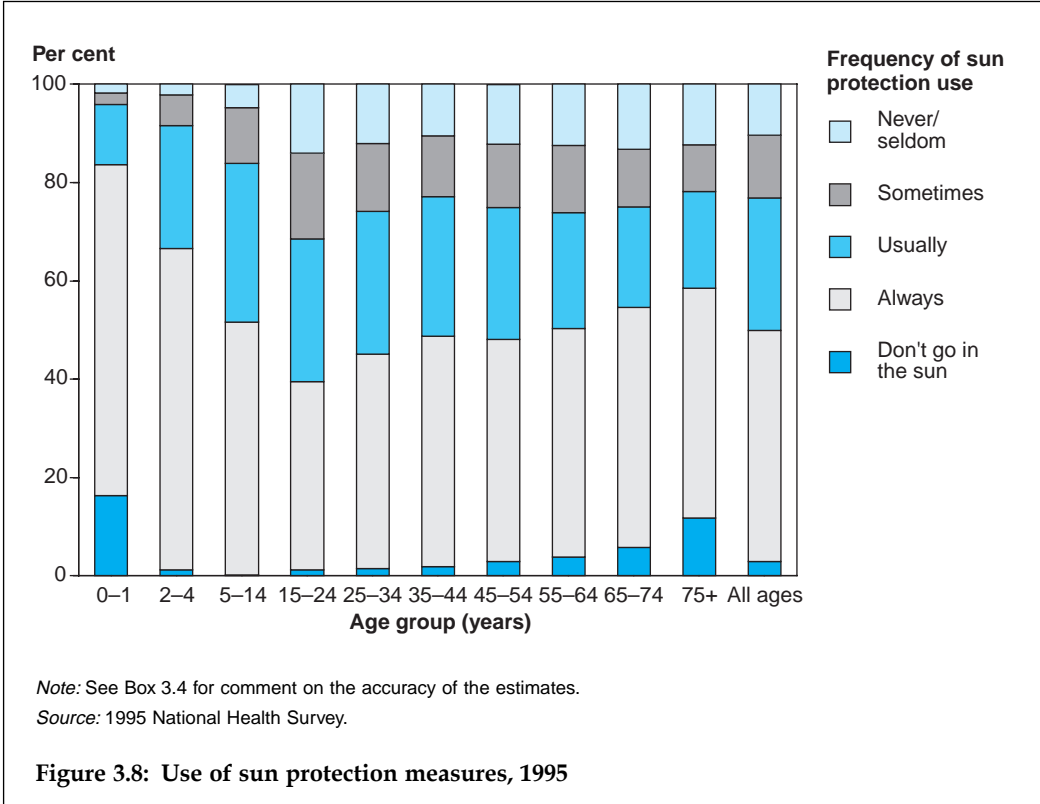
Walking increased in popularity during the 1990s with 45% of men and 53% of women walking for recreation or exercise in 1995, compared with 41% and 49%, respectively, in 1989-90. Despite this increase, the overall proportions of people undertaking physical activity at moderate intensities did not change between 1989-90 and 1995, suggesting that walking may have replaced other forms of moderate physical activity (Armstrong 1998).

In an effort to increase physical activity participation rates, a national participation strategy, Active Australia, has been established. Active Australia represents the interests of Commonwealth and State government agencies, including the sport, health and fitness sectors. The sports and physical activities that attracted most participants in 1998-99 were walking (23%), swimming (15%), aerobics (11%), golf (9%) and tennis (6%). Participation in organised sport and physical activity has increased from around 27% in 1996-97 to 30% in 1998-99 (ABS 1999a).

Sun exposure

Australia has the highest incidence of skin cancer in the world (DHFS & AIHW 1998). Skin cancer is the most common cancer in Australia and can largely be prevented by taking simple measures such as wearing protective clothing, applying sunscreens or avoiding the sun. Childhood exposure to sunlight has been shown to be an important cause of skin cancer (NHMRC 1996).

The 1995 National Health Survey found that 77% of the population were protected from exposure to the sun, by always or usually taking some sun protection measure, or by not going out in the sun (Figure 3.8). The most protected group were young children, of whom 96% aged under 2 years and 92% of those aged 2–4 years were protected or not exposed to the sun. Only 69% of persons aged 15–24 years used sun protection or were not exposed to the sun. Overall, 23% of the population never, seldom or only sometimes used any protection from exposure to the sun.



Some issues that can influence the accuracy of the survey results are discussed in Box 3.4.

In general, the type of sun protection used varied with age (Table 3.7). Hats followed by sunscreen and clothing were the most common types of protection used by children 0–14 years. For people aged 15–54 years, the most common type of protection was sunglasses followed by hats and sunscreen. Those aged 55 years and over tended to prefer hats, with sunglasses and sunscreen as the next most frequently mentioned protection measure taken.

Although there are no national trend data, results from surveys in Victoria and New South Wales suggest that the use of sun protective measures has been rising. Data from a series of sun behaviour surveys in Victoria show a rise in the use of sunscreen in people exposed to the sun between 11 a.m. and 3 p.m. on Sundays in the summer months, from 19% in 1988 to 34% in 1995 (Hill & Boulter 1996). Further, the proportion

Table 3.7: Type of sun protection used, by age group, 1995 (per cent)

Age group	Sunscreen	Umbrella	Hat	Clothing	Sunglasses	Avoid sun	Other
0–1	49	9	63	49	8	39	3
2–4	69	6	84	55	22	31	1
5–14	65	3	81	48	22	20	—
15–24	46	2	48	42	56	21	—
25–34	46	4	51	40	67	27	1
35–44	44	5	54	34	67	27	1
45–54	37	5	55	29	59	22	1
55–64	32	5	57	24	49	19	—
65–74	31	8	60	22	39	20	1
75 and over	22	8	57	17	30	19	1
Total	45	5	59	36	49	23	1

Source: 1995 National Health Survey.

of people who wore a brimmed hat between 11 a.m. and 3 p.m. on the previous Sunday rose from 9% in 1988 to 20% in 1995. A similar trend was observed in New South Wales: in a survey of high school adolescents the percentage using high-level sun protection, measured by a score based on protection by a hat, clothing or SPF 15+ sunscreen, increased from 39% in 1991–92 to 57% in 1994–95 (Armstrong 1996). Over this period there was an associated decline in attitudinal and normative beliefs favourable to getting suntanned: the percentage of people who believed that a suntanned person is more healthy declined from 17% in 1988 to 8% in 1995.

Box 3.4: Accuracy of sun protection estimates

Respondents in the 1995 National Health Survey were asked what protective measures they deliberately take when they go out in the sun. Such questions can result in over-estimates of actual behaviour as respondents tend to report what they like to do rather than what they actually did (Borland 1996).

It was not possible to conduct personal interviews with persons in some age groups: a parent or a responsible adult was interviewed on behalf of all children aged 0–14 years and those children aged 15–17 years where permission to interview them personally was not given.

The question listed various sun protective items, but it implied the use of hats, clothing or sunglasses to be for sun protection.

Vaccination status

Immunisation is the administration of vaccine(s) to prevent disease and so reduce death and serious illnesses, particularly in infants and children but also in adults. The potential risks of immunisation are much lower than the risks or complications from these diseases. Immunisation is recognised as a key cost-effective public health program (Freeman & Robbins 1994).

The effectiveness of immunisation was first demonstrated by Dr Edward Jenner some 200 years ago with his experiments with vaccination against smallpox. Since then, the number of vaccines has grown and the role of immunisation has expanded significantly. In the early 1970s the World Health Organization (WHO) Expanded Programme on Immunization set as a goal the universal immunisation of children against diphtheria, pertussis, tetanus, tuberculosis, poliomyelitis and measles. Goals were also set for the eradication through immunisation of smallpox (achieved in 1977), poliomyelitis (currently under way) and measles (a future possibility) (Plotkin & Orstein 1999).

In Australia, vaccine-preventable diseases are still responsible for serious illness and occasional death (Carnie 1997). The schedule of age-appropriate immunisations is set out in the *Australian Immunisation Handbook* (NHMRC 1997, 2000).

There have been a number of government strategies and programs to improve immunisation coverage in Australia. These include the National Immunisation Strategy released in 1993 (NHMRC 1993), the Immunise Australia: Seven Point Plan announced in February 1997, including the GP Immunisation Incentives Program from mid-1998, the Australian Childhood Immunisation Register (ACIR) begun in 1996 (National Childhood Immunisation Committee 1996), and most recently the Measles Control Campaign (MCC). The effectiveness of these programs will ultimately be measured by the extent of immunisation coverage and the number of new cases (incidence) of vaccine-preventable diseases.

Immunisation coverage

Immunisation coverage in Australia has been estimated in a number of ways including special surveys through the State and Territory Public Health Departments, academic organisations, ABS and other organisations (Lister et al. 1999). More recently the implementation of the ACIR has provided a means of measuring immunisation coverage at a national level for vaccines on the standard national childhood vaccination schedule. There is an ongoing use of surveys for vaccine-preventable diseases for other age groups and checks of validity of the ACIR data.

The ACIR was set up as a part of the National Childhood Immunisation Program to collect immunisation-coverage information for Australian children under 7 years of age registered with Medicare since January 1996. The ACIR performs a number of functions, including the collection of information from providers, provision of immunisation information for parents, and administration of a recall or reminder system for parents. The ACIR also provides regular reports on immunisation coverage at national, State/Territory or local level for public health authorities (National Childhood Immunisation Committee 1996).

Since 1997 and as part of the Immunise Australia program, a number of initiatives have been introduced to improve both immunisation uptake and notification of encounters. Schemes to encourage parent compliance with the Australian Standard Vaccination Schedule have included the linkage of immunisation status to the Commonwealth Child Care Rebate scheme (with the accompanying history form), the Childcare Assistance scheme, and the Maternity Immunisation Allowance. The General Practice Immunisation Incentives scheme encourages participation by general practitioners in the delivery of immunisation and reporting to ACIR of immunisation-encounter details.

ACIR coverage results are reported for birth cohorts at 1 and 2 years of age and expressed as the percentage of children immunised (O'Brien et al. 1998). The first coverage estimates for children at age 1 year were published in March 1998 for the cohort born between 1 January 1996 and 31 March 1996 (O'Brien et al. 1998). Subsequent reports have been published on a quarterly basis and have shown a progressive increase in coverage. The most recent report of immunisation coverage found that for those aged 1 year (cohort born between 1 July 1998 and 30 September 1998) 87% were fully immunised (Table 3.8) and for those aged 2 (cohort born in the 3-month period between 1 July 1997 and 30 September 1997) 74.9% were fully immunised (Table 3.9) (Communicable Diseases Network 2000).

Table 3.8: Proportion of children immunised at 1 year of age, preliminary results by disease and State for the birth cohort 1 July to 30 September 1998

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Number of children	22,272	15,770	12,347	6,311	4,730	1,661	1,065	848	65,004
Diphtheria, tetanus and pertussis (%)	86.5	89.1	90.5	87.3	89.0	89.3	90.0	86.9	88.3
Poliomyelitis (%)	86.6	89.1	90.5	87.3	89.0	89.3	90.0	86.9	88.3
<i>Haemophilus influenzae</i> type b (%)	85.7	88.6	90.6	86.9	88.6	88.7	90.2	88.9	87.9
Fully immunised (%)	84.7	88.0	89.9	85.9	88.0	88.2	89.8	83.8	87.0
Change in fully immunised since last quarter (%)	+0.5	+0.3	+1.5	-0.3	-1.0	+1.2	+0.8	+0.9	+0.5

Source: Australian Childhood Immunisation Register.

Table 3.9: Proportion of children immunised at 2 years of age, preliminary results^(a) by disease and State for the birth cohort 1 July to 30 September 1997

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Number of children	22,876	15,840	12,688	6,516	4,778	1,605	1,073	924	66,300
Diphtheria, tetanus and pertussis (%)	81.4	83.5	84.9	81.2	84.6	82.1	87.2	75.9	82.8
Poliomyelitis (%)	81.4	83.6	84.9	81.2	84.6	82.1	87.2	75.9	82.8
<i>Haemophilus influenzae</i> type b (%)	80.5	83.2	85.3	80.9	83.9	80.4	86.8	81.2	82.4
Measles, mumps and rubella (%)	87.2	90.5	90.2	87.5	91.0	88.8	91.1	86.3	89.0
Fully immunised (%)	71.0	76.8	79.4	73.0	77.8	74.0	82.9	69.6	74.9
Change in fully immunised since last quarter (%)	-1.2	-0.5	-1.7	-0.4	+1.0	-3.1	-0.9	+2.5	-1.0

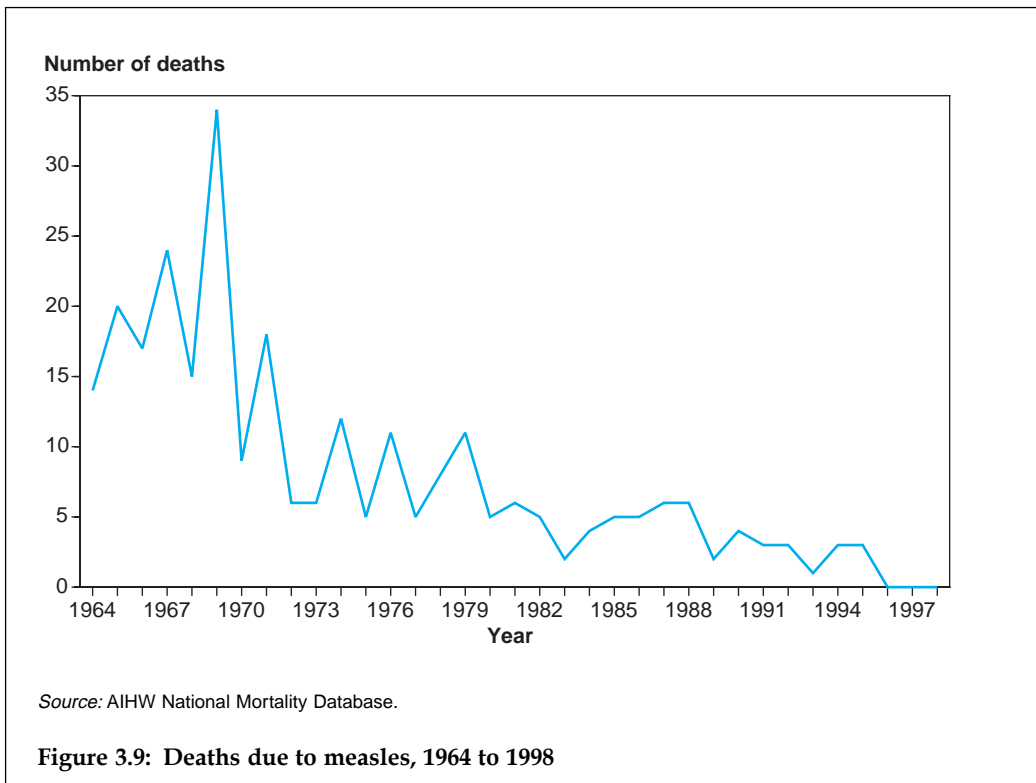
(a) The proportions shown as 'fully immunised' appear low when compared with the proportions for individual vaccines. This is at least partly due to poor identification of children on immunisation encounter forms.

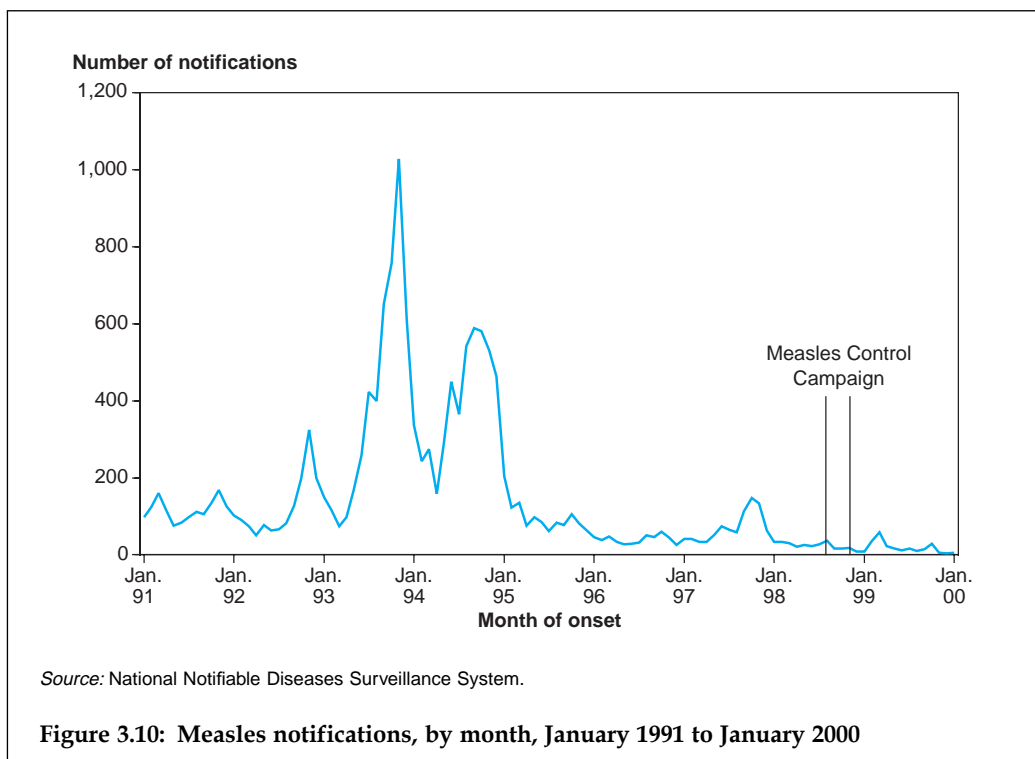
Source: Australian Childhood Immunisation Register.

Measles as an example of the effectiveness of immunisation

Measles is often a severe disease, sometimes complicated by otitis media (2.5% of cases) and bronchopneumonia (4%). Acute encephalitis occurs in a small number of reported cases and has a mortality of 10–15%, and 15–40% of survivors have permanent brain damage. Subacute sclerosing panencephalitis is a late complication of measles (occurring in about 1 in 25,000 cases) that causes progressive brain damage and is always fatal (NHMRC 1997).

The measles vaccine was first licensed in Australia in 1968 and was in routine use by the early 1970s, but coverage estimates from this time are not available. The introduction of the measles vaccine resulted in a decrease in the number of measles cases, the number of admissions to hospital for measles and the number of deaths due to measles (Figure 3.9). However, measles epidemics continued to occur. In 1993 and 1994, a large epidemic of measles affected Australia with over 9,000 notified cases (Figure 3.10) and a peak in the number of hospitalisations at about 1,100 (MEAC 2000a). A second dose of measles vaccination for those aged 10–16 years was implemented in 1994 by States and Territories but coverage estimates from this time are not available. Since then, the number of notified cases has decreased (Figure 3.10). Measles is now a notifiable disease in all States and Territories.





A further epidemic of measles was predicted for 1998 from serological surveys in New South Wales and South Australia that showed gaps in levels of immunity (Forrest et al. 1998). A set of recommendations was developed to prevent the predicted epidemic. The NHMRC recommended in 1998 that the second dose of the measles, mumps and rubella vaccine should be given to children when aged 4–5 years rather than at age 10–16 years. The change in scheduling was to minimise the susceptible population by shortening the interval between the first and second dose from 10 years to 3 years. More recently, the recommendation for the second dose has been updated to 4 years. The MCC followed this decision to ensure that all school children aged 5–12 years received their second dose.

The MCC was conducted from August to November 1998 with primary school children the main target for measles immunisation. About 96% (1.7 million) of all primary school children were vaccinated, with about 1.3 million vaccinated in the school program (MEAC 2000b). Overall, the MCC resulted in increased protection against measles. A serosurvey conducted after the MCC showed that 94% of children aged 6–12 years were serologically immune compared to 84% before the MCC (MEAC 2000b). The impact of the MCC on notifications of measles cases is shown in Figure 3.10. It was estimated that 17,500 cases of measles were averted (MEAC 2000b). The national immunisation coverage for measles, mumps and rubella vaccine measured by ACIR has increased from 82.5% for the first 2-year cohort of children born between 1 January 1996 and 31 March 1996 (Communicable Diseases Network 1998) to 89% for the 2-year cohort for children born between 1 July 1996 and 30 September 1996 (Communicable Diseases Network 2000).

Sexual practice

Sexual activity can carry health risks such as sexually transmitted diseases (STDs) and cancer of the cervix. It can also lead to unwanted pregnancy. The risks are mainly due to 'unsafe sex', where precautions are not taken against transmitting infections or against unintended pregnancy. 'Safe sex' does not guarantee absolute protection against STDs, and condoms may not prevent the transmission of genital herpes and warts.

Unsafe sex can lead to infections such as gonorrhoea, chlamydia, syphilis, hepatitis and HIV/AIDS, and can have serious and long-term health effects. Also, 90% of cases of cancer of the cervix are due to the sexually transmitted human papilloma virus. Unwanted pregnancy can lead to economic and social problems.

A study of the burden of disease and injury in Australia attributed 97% of the male burden and 71% of the female burden for HIV/AIDS to unsafe sex (AIHW: Mathers et al. 1999). All of the burden of other sexually transmitted diseases was attributed to unsafe sex. Table 3.10 shows the contribution of these diseases to the estimated total attributable burden of unsafe sex in Australia in 1996. HIV/AIDS accounts for 61% of the total, followed by cervical cancer (24%) and other sexually transmitted diseases (8%). In total, unsafe sex contributes about 1% to the burden of disease in Australia (1.1% for males and 0.7% for females). The burden of unsafe sex is of a similar magnitude to the burden of falls or melanoma.

Table 3.10: The attributable burden of unsafe sex by condition, 1996

Cause	Deaths	YLL ^(a)	YLD ^(b)	DALYs ^(c)	Per cent of total DALYs
HIV/AIDS	506	11,541	2,361	13,901	0.55
Other sexually transmitted diseases ^(d)	5	82	1,823	1,904	0.08
Hepatitis B	51	820	143	964	0.03
Hepatitis C	19	226	27	253	0.01
Abortion	1	22	299	321	0.01
Other maternal conditions	1	37	223	260	0.01
Cervical cancer	292	4,533	907	5,441	0.22
Total	875	17,261	5,698	22,959	0.91

(a) Years of life lost due to mortality.

(b) Years of 'healthy' life lost due to disability.

(c) Disability-adjusted life year.

(d) Gonorrhoea, syphilis, chlamydia and pelvic inflammatory disease.

Source: AIHW: Mathers et al. 1999.

Use of contraceptives

Although conclusions about sexual behaviours, including unsafe sex, cannot be drawn from contraceptive use, it does provide a context in which to consider sexual practices as a risk factor.

The 1995 National Health Survey collected information on contraceptive use by women aged 18–49 years (Table 3.11). The contraceptive pill is the most commonly used method of contraception among Australian women, used by 40% of women. Sterilisation and use of condoms were the next most frequently used contraceptive methods. There is

variation in contraceptive use across age groups. Among younger women, the contraceptive pill and condoms were most commonly used, but use of these diminished with age. Sterilisation was the most frequently reported method of contraception among women aged over 40 years.

Table 3.11: Type of contraception used by women aged 18–49 years, 1995 (per cent)

Method	Age of users (years)							Total
	18–19	20–24	25–29	30–34	35–39	40–44	45–49	
Contraceptive pill	66.3	71.1	59.2	43.0	31.3	16.9	10.1	40.0
Condom	32.2	21.6	27.0	21.2	13.9	10.5	7.2	17.6
IUD	—	2.1	—	2.8	3.1	6.1	2.8	3.0
Periodic abstinence	—	—	3.6	4.2	3.9	3.0	2.4	3.0
Other temporary method	—	2.6	2.4	3.9	3.7	2.1	—	2.6
Female sterilisation	—	—	3.6	10.7	21.6	36.1	49.9	19.2
Male sterilisation	—	—	2.8	14.2	22.4	25.3	25.8	14.5
Number using contraception	111,300	441,100	428,600	453,700	476,500	448,200	392,600	2,757,900
Users as a proportion of all women	49.7	65.7	64.5	65.4	71.6	71.8	67.4	66.7

Source: ABS 1998b.

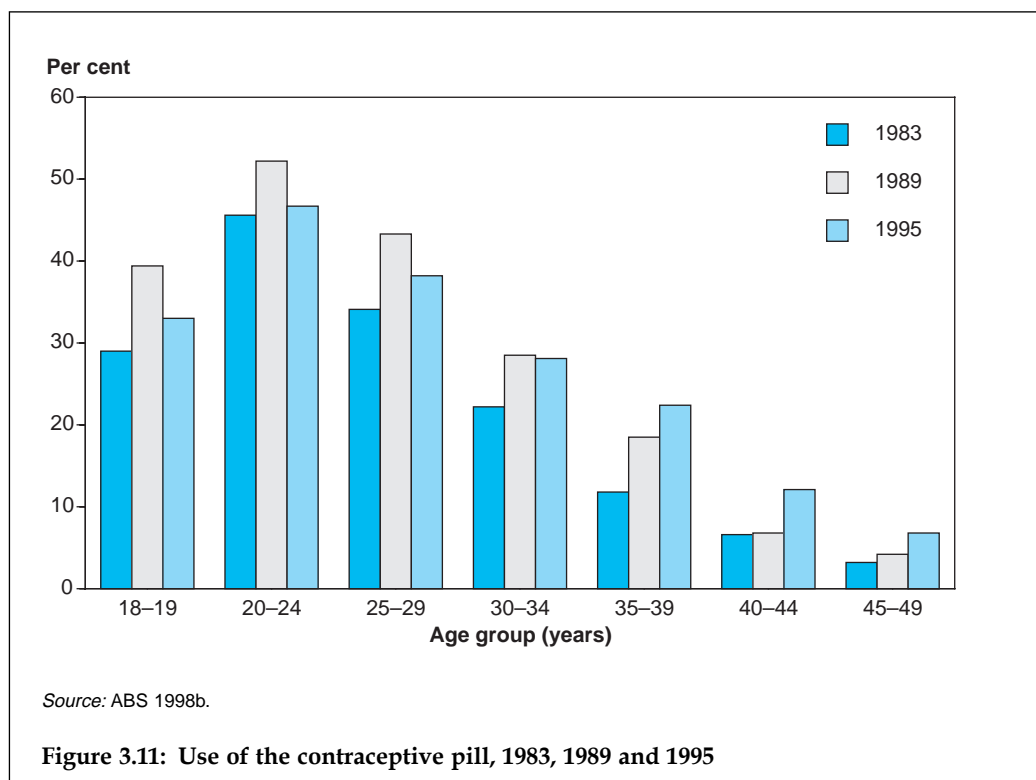


Figure 3.11: Use of the contraceptive pill, 1983, 1989 and 1995

Data on the use of the pill can be compared for 1983, 1989 and 1995 (Figure 3.11, page 163). The proportion of women aged 18–49 years using the pill increased from 24% in 1983 to 28% in 1989 but changed little to 1995 (27%). The highest usage continues to be in the age group 20–24 years.

It is estimated that over 85% of all HIV infection in Australia has been transmitted by unsafe sexual contact between men (NCHECR 1999). Of men who have sex with men, the percentage engaging in unprotected anal intercourse is the principal indicator of unsafe sexual behaviour. Surveys in Sydney during the 1990s found that, of men who have sex with men, around 30% reported unprotected anal sex with regular partners in the previous 6 months. Around 15% reported unprotected anal sex with casual partners in the previous 6 months. Surveys carried out in other capital cities show similar levels of unsafe sexual behaviour (NCHECR 1999).

3.5 Biomedical factors

Body weight

The association between overweight or obesity and health problems such as coronary heart disease, stroke, heart failure, type 2 diabetes, osteoarthritis, sleep apnoea, gallstones, and reproductive problems among women is well documented (NHLBI 1998). Overweight and obesity accounted for over 4% of the total burden of disease in Australia in 1996 (AIHW: Mathers et al. 1999).

Being underweight is also associated with poor health, including conditions such as osteoporosis, ulcers, mental conditions such as depression and eating disorders (Gilmore 1999).

Inappropriate body weight is due mainly to an imbalance between energy intake (diet) and energy expenditure (physical activity). Other factors, including genetics and environment, also play a role (Pi-Sunyer 1993).

Among those who are overweight, weight loss reduces the incidence and severity of high blood pressure, high blood cholesterol, diabetes and osteoarthritis (NHLBI 1998).

Body mass index (BMI) is used to estimate the prevalence of underweight, normal weight, overweight and obesity in a population.

In 1995, just over 7.4 million adult Australians (56% of those aged 18 years and over) were overweight or obese (BMI \geq 25). Of these, over 2.4 million (or 19% of the adult population) were obese (BMI \geq 30). Men were more likely to be overweight or obese than were women, 64% compared with 49%. The proportion of overweight or obese people increased with age and peaked in the age groups 45–54 and 55–64 years for men (76%) and 55–64 years for women (67%) (Figure 3.12) (AIHW 1999c).

In 1995, the proportion of overweight or obese children and adolescents aged 2–17 years was 21% for boys and 23% for girls.

In 1995, the proportion of underweight (BMI $<$ 18.5) women aged 18 years and over was almost 3%. However, among women aged 18–24 years the prevalence was over 6%. The proportion of underweight men aged 18 years and over was less than 1%. The proportion of underweight children and adolescents aged 2–17 years was 6% for boys and 5% for girls.