



Introduction

Chronic diseases and their risk factors show significant variation across population groups in terms of their incidence, prevalence, prevention, management and associated health outcomes. Regular comparisons provide insights into not only the nature of these problems but also what has been achieved and what works in different settings.

Indigenous Australians are known to have a higher burden of chronic diseases. These diseases are also more frequently reported in regional Australia (in part because of a higher representation of Indigenous people in these areas) and among those who are socioeconomically disadvantaged.

Although there are shortcomings in the available data and difficulties in using them to determine these differentials, the information currently available can be examined to help answer questions such as:

- which chronic diseases and risk factors particularly affect Australians living in regional areas?
- how does the distribution of chronic diseases and risk factors vary according to socioeconomic status in Australia?
- to what extent do Indigenous Australians experience higher rates of chronic diseases and risk factors compared with other Australians?
- how much of the high mortality of Indigenous Australians is attributable to chronic diseases?

Regional variations in chronic diseases and risk factors

Despite the perceived health advantages of living in rural areas (clean air, less traffic, more relaxed lifestyle), people living in rural and remote areas of Australia have poorer health outcomes compared with those living in urban areas. In addition, people in rural and remote areas experience higher levels of health risk factors.

However, rurality itself is not the main factor in producing poorer health among people outside major cities. Rather, the factors associated with rurality are the causes of comparative health disadvantage in those areas. Such factors include:

- socioeconomic disadvantages (including lower incomes and education levels)
- geographic isolation and attendant difficulties with access to health care
- shortage of health care providers and services
- greater exposure to injury
- greater difficulties in transport and communications
- sparsely distributed populations leading to diseconomies of scale.



Many of these factors are further compounded by the higher representation in rural and remote areas of Indigenous people, who experience much poorer health than other Australians.

The focus in this section is on regional differences in the prevalence of the risk factors for chronic diseases and measures of morbidity and mortality owing to chronic diseases. Whereas mortality can be reasonably well reported for each of the regions in Australia, information on the prevalence of risk factors and diseases is largely based on survey data, and therefore the reporting of this information is limited to those risk factors and diseases that are adequately captured in self-reports provided in surveys.

Population distribution across Australia

The current standard for reporting health and other population features in Australia according to regions is the Australian Standard Geographical Classification of Remoteness Areas developed by the Australian Bureau of Statistics, which includes major cities, inner regional areas, outer regional areas, remote areas and very remote areas. Nearly two-thirds of the population in 2001 lived in major cities, defined as the least remote area, compared with 2% and 1% in remote and very remote areas respectively (Table 5.1). Note that the major cities category does not include the capital cities of Hobart and Darwin, as their populations are below the threshold of 250,000 for that category.

Table 5.1: Australian population by remoteness areas, 2001

Area	Population (millions)	Per cent
Major cities	12.9	66
Inner regional	4.0	21
Outer regional	2.0	10
Remote	0.3	2
Very remote	0.2	1
Migratory	<0.1	
Total Australia	19.5	100

Source: AIHW 2004f.

Regional variation in the prevalence of lifestyle risk factors

Indicator measures for three of the four main behavioural risk factors for chronic diseases — smoking, risky alcohol consumption and physical inactivity — were in the 2001 National Health Survey (NHS). Information on the fourth risk factor, poor nutrition, was not included in this analysis as there is no single measure for this risk factor and it was decided that the NHS nutritional data did not lend itself to regional analysis.

The three biomedical risk factors for chronic diseases have also been measured in the NHS. However, self-reported information on high blood pressure and high blood cholesterol is not considered to be accurate enough for inclusion here. Biomedical surveys have been conducted which directly measure blood pressure and cholesterol levels, but these have been restricted mainly to urban areas. The only biomedical risk factor that can be reported from the NHS across regions therefore is excess weight, using the body mass index values from self-reported weight and height.

A further limitation arises from the sample size and coverage of the NHS. The sample was about 26,000 persons, resulting in large confidence intervals in the rates for small subgroups. The survey also did not cover sparsely settled areas, and therefore rates can be reported for only three of the five remoteness regions — major cities, inner regional and outer regional — and not for the remote or very remote regions.

The 2001 NHS found that half of Australian adults had excess weight (overweight or obese), one-third were sedentary (no leisure time exercise), one-quarter were current smokers, and 1 in 10 consumed alcohol at risky levels (Table 5.2). People in regional areas were more likely than those in the major cities to have each of these risk factors. For example, the rate of risky alcohol use in regional areas was 1.22 times the rate in major cities. For smoking, the rate ratio was 1.11, for excess weight 1.07, and for being sedentary 1.05.

The results of the 2001 NHS can be compared with those from the 1995 NHS to gauge trends in the prevalence of these risk factors (Table 5.3). These comparisons indicate that:

- ♦ there were significant declines in smoking in major cities for both males and females, but not in regional areas
- ♦ there were significant increases in all areas for both males and females in levels of risky alcohol consumption
- ♦ there were significant declines in most areas for both males and females in levels of being sedentary, indicating some increases in leisure-time physical activity
- ♦ despite these increased levels of exercise, there were significant increases in most areas for both males and females in levels of excess weight.



Table 5.2: Prevalence of selected health risk factors by remoteness categories, 2001

Risk factor (ages covered)		Rate (%)		Rate ratio ^(a)			
		Total population	Major cities	Major cities	Inner regional	Outer regional	Inner + outer regional
Current smoker (18+)	Males	28	28	1.00	0.98	1.18*	1.05
	Females	21	20	1.00	1.15*	1.27*	1.19*
	Persons	24	24	1.00	1.05	1.22*	1.11*
Risky alcohol consumption (18+)	Males	13	12	1.00	1.30*	1.39*	1.33*
	Females	8	8	1.00	1.06	1.09	1.07
	Persons	11	10	1.00	1.20*	1.27*	1.22*
Physical inactivity (15+)	Males	30	29	1.00	1.06	1.15*	1.09*
	Females	32	32	1.00	0.96	1.11	1.01
	Persons	31	30	1.00	1.01	1.13*	1.05*
Overweight or obese (15+) ^(b)	Males	56	54	1.00	1.03	1.08	1.05*
	Females	41	39	1.00	1.10*	1.09	1.10*
	Persons	48	46	1.00	1.06*	1.08*	1.07*

* Indicates a rate significantly different ($p < .005$) from the comparable rate in major cities.

(a) Ratio of the observed number of people with the risk factor in the region compared with the number expected if the age-specific rates in major cities were to apply to the population in that region.

(b) Rates for excess weight (the overweight plus obese categories) calculated after removing 'not stated' (6% of males, 10% of females) from total.

Source: ABS National Health Survey 2001, as reported in ABS 2002b (for total population) and AIHW 2005g (for regions).

Table 5.3: Changes in risk factor prevalence by remoteness categories, 1995 to 2001

Risk factor		Major cities	Inner regional	Outer regional	Inner + outer regional
Ratio of 2001 to 1995^(a)					
Current smoker	Males	0.95*	0.96	1.01	0.98
	Females	0.93*	1.03	1.12	1.06
	Persons	0.94*	0.99	1.06	1.02
Risky alcohol consumption	Males	1.26*	1.36*	1.22*	1.31*
	Females	1.36*	1.35*	1.69*	1.45*
	Persons	1.30*	1.36*	1.35*	1.36*
Physical inactivity	Males	0.90*	0.88*	0.89*	0.89*
	Females	0.91*	0.93*	0.99	0.95
	Persons	0.91*	0.91*	0.94*	0.92*
Overweight or obese	Males	1.10	1.14*	1.13*	1.14*
	Females	1.18*	1.20*	1.09	1.16*
	Persons	1.13*	1.16*	1.12*	1.15*

* Indicates a 2001 rate significantly different ($p < 0.05$) from the comparable rate in 1995.

(a) Ratio of the observed number of people with the risk factor in 2001 compared with the number expected if the 1995 age-specific rates in each area were to apply to the 2001 population in that area.

Source: ABS National Health Surveys 1995 and 2001, as reported in AIHW 2005g.

Regional variation in the prevalence of chronic disease

Only 4 of the 12 major chronic diseases are prevalent at levels high enough to allow for analysis at the regional level (Table 5.4). Of these, arthritis was more likely to be reported in inner and outer regional areas than in major cities. In contrast, males in major cities were more likely to report asthma and diabetes than their counterparts in the regional areas.

Table 5.4: Prevalence of selected chronic diseases by remoteness categories, 2001

Disease		Rate (%)		Rate ratio			
		Total population	Major cities	Major cities	Inner regional	Outer regional	Inner + outer regional
Arthritis	Males	11	10	1.00	1.19*	1.14	1.17*
	Females	16	15	1.00	1.14*	1.11	1.13*
	Persons	14	13	1.00	1.16*	1.11*	1.14*
Asthma	Males	11	11	1.00	0.88*	0.91	0.89*
	Females	13	12	1.00	1.05	1.08	1.06
	Persons	12	12	1.00	0.97	1.00	0.98
COPD	Males	3	3	1.00	0.89	0.81	0.86
	Females	4	4	1.00	1.02	0.70*	0.90
	Persons	4	4	1.00	0.96	0.75*	0.88
Diabetes	Males	3	3	1.00	0.71*	0.75	0.72*
	Females	3	3	1.00	1.00	1.14	1.05
	Persons	3	3	1.00	0.85	0.93	0.88

* Indicates a rate significantly different ($p < 0.05$) from the comparable rate in major cities.

Source: ABS National Health Survey 2001, as reported in ABS 2002b and AIHW 2005g.

Regional variation in mortality from chronic diseases

Mortality data are able to show regional differences in the effects of chronic diseases more clearly than the self-reported prevalence data from sample surveys. Because of the small sizes of the populations in remote areas, it is more appropriate to use standardised mortality ratios (SMRs) rather than death rates to compare mortality levels between the regions. An SMR is the ratio of the number of deaths observed in a particular region compared with the number of deaths expected if that region experienced the same age-specific death rates as the population in major cities. It is also necessary to combine the two smallest categories, remote and very remote, and several years of data (2001 to 2003 in this case) to have sufficient numbers of cases in each category for analysis.

These data show that for some of these diseases there is a strong relationship between remoteness and death rates (Table 5.5). Mortality for coronary heart disease (CHD), diabetes and COPD tends to increase for both males and females with increasing remoteness. For chronic kidney disease, the relationship also is evident for females. The contrast between major cities and the two remote categories (remote and very remote) is most striking for diabetes, with the rates for males in the remote areas double those for males in the major cities, the rates for females in the remote areas triple those for females in major cities. For cerebrovascular disease, lung cancer and colorectal cancer, the relationship is weak or non-existent.



Table 5.5: Standardised mortality ratios for chronic diseases by remoteness categories, 2001 to 2003

Disease		Major cities	Inner regional	Outer regional	Remote + very remote
CHD	Males	1.00	1.10*	1.16*	1.22*
	Females	1.00	1.07*	1.08*	1.21*
Cerebrovascular disease	Males	1.00	1.02	1.03	1.06
	Females	1.00	1.02	1.00	0.92
Lung cancer	Males	1.00	1.05	1.12*	1.11
	Females	1.00	1.02	1.11	1.20
Colorectal cancer	Males	1.00	1.08	1.11	0.86
	Females	1.00	1.13*	1.12	0.91
Diabetes	Males	1.00	1.05	1.31*	2.13*
	Females	1.00	1.09	1.38*	3.52*
COPD	Males	1.00	1.20*	1.43*	1.76*
	Females	1.00	1.11*	1.12	1.57*
Chronic kidney disease	Males	1.00	0.99	1.10	1.44
	Females	1.00	1.14*	1.21*	2.22*

* Indicates a rate significantly different ($p < 0.05$) than the major cities rate.

Source: AIHW National Mortality Database.

Socioeconomic variation in chronic diseases and risk factors

A person's position in society — socioeconomic status (SES) — is a strong predictor of health and risk of injury. It is well established (Kaplan 1999) that:

- ♦ the risk of adverse health outcomes increases with a decreasing level of socioeconomic position
- ♦ the relationship is widespread, being found in many industrialised nations and during most periods of time
- ♦ the relationship is apparent for all age groups
- ♦ the strength of the association varies between groups and places over time.

With some exceptions, the lower a person's SES, the shorter his or her life expectancy and the more prone he or she is to a wide range of chronic diseases and conditions. The link between SES and health begins at birth and continues through life, but the strength of the relationship varies at different life stages.

There is a strong, but indirect, two-way association in which SES affects health and health affects SES (Ostrove & Adler 1998). The multiple components of SES, their impact on health, and the mechanisms and pathways by which this impact occurs are not fully understood. A comprehensive analysis includes macroeconomic contexts and social factors as well as more immediate social environments, individual psychological and

behavioural factors, and biological predispositions and processes. Some factors that can lead to SES effects on health include (Adler & Ostrove 1999):

- ✦ differential access to high-quality health care
- ✦ individual factors such as smoking, exercise, nutrition, stress and depression
- ✦ environmental factors such as pollution and overcrowding
- ✦ social environments such as neighbourhoods, work, interpersonal support or conflict, and violence and discrimination.

Other factors contributing to the association between SES and health include the long-term effects of prenatal and early childhood environmental factors (Barker 1997), the cumulative biologic effects of prolonged exposures to individual stressful events (McEwen 1998), reactions to societal factors such as rising levels of income inequality or unemployment (Wilkinson 1996), and discrimination (Krieger 1999). However, the mechanisms behind these associations are still being determined, and further research is needed to enhance our understanding of the pathways by which socioeconomic factors affect the health of individuals and their communities (Pearce & Davey Smith 2003; Marmot 1999).

Socioeconomic variation in the prevalence of behavioural risk factors, chronic diseases and chronic disease mortality is highlighted below through examining differences across quintiles of relative socioeconomic disadvantage. This method involves dividing the population into fifths ('quintiles') based on certain characteristics (for example, levels of education and unemployment) of their area of residence.

Box 5.1: Limitations of area-based measures of socioeconomic status (SES)

Area-based measures of SES are likely to understate health inequalities because of socioeconomic factors. Owing to misclassification error (that is, ascribing area SES to individuals), estimates of difference across the quintiles will be smaller than if data on individual-level measures of SES were used (Hyndman et al. 1995). In addition, the exclusion of the 'sparsely settled' areas of Australia from the NHS sampling frame results in the omission of data from a high percentage of Indigenous people, who are the population group with the poorest health, high levels of disadvantage and high rates of many chronic conditions. Thus, socioeconomic inequalities in chronic disease among the wider population are likely to be larger than those reported here.



Socioeconomic variation in the prevalence of lifestyle risk factors

Data on a number of risk factors collected in the 2001 NHS show a striking association with socioeconomic status, in particular for people who are smokers and those who did not exercise, with continuous gradients and significantly elevated rates among those in the more disadvantaged areas, as shown by the rate ratios (Table 5.6). The differences in male and female rates are also of interest. For high-risk alcohol consumption among females, the socioeconomic gradient was reversed, with the highest rates found among those living in the least disadvantaged areas.

Table 5.6: Prevalence of selected health risk factors by quintile of socioeconomic disadvantage, people aged 18–64 years, 2001

Risk factor	Sex	Rate ^(a)	Rate ratio				
			Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Tobacco smoking	Males	305.8	1.00	1.40*	1.55*	1.71*	1.95*
	Females	240.1	1.00	1.29*	1.34*	1.48*	2.00*
	Persons	272.8	1.00	1.35*	1.45*	1.61*	1.96*
High-risk alcohol consumption ^(b)	Males	69.8	1.00	1.09	1.26*	1.26*	1.45*
	Females	21.3	1.00	0.59*	0.94	0.76	0.87
	Persons	45.4	1.00	0.93	1.16	1.12	1.22*
Physical inactivity	Males	287.7	1.00	1.20*	1.36*	1.52*	1.68*
	Females	282.2	1.00	1.19*	1.29*	1.35*	1.65*
	Persons	284.9	1.00	1.20*	1.32*	1.43*	1.66*
Overweight	Males	394.6	1.00	1.03	1.08	0.99	0.86*
	Females	217.4	1.00	0.95	1.07	0.98	0.89
	Persons	305.5	1.00	1.00	1.07*	0.99	0.86*
Obesity	Males	152.4	1.00	1.27*	1.19*	1.21*	1.44*
	Females	152.6	1.00	1.39*	1.50*	1.53*	1.72*
	Persons	152.5	1.00	1.32*	1.33*	1.35*	1.57*

* Indicates the rate in this quintile is statistically significantly different from the rate in Quintile 1.

(a) Rate per 1,000 population for all quintiles combined, age-standardised to the Australian population at 30 June 2001.

(b) Average daily consumption of seven or more standard drinks for males and five or more standard drinks for females.

Notes

1. Based on self-reported information.
2. Respondents could report more than one risk factor.
3. Quintile 1 represents the least disadvantaged areas; Quintile 5 represents the most disadvantaged areas.
4. The rate ratio for each quintile is calculated as the rate in that quintile divided by the rate in Quintile 1.

Source: Glover et al. 2004.

Socioeconomic variation in the prevalence of chronic diseases

Significant socioeconomic inequalities are evident for many of the major chronic diseases (Table 5.7). For many diseases there is a strong, continuous socioeconomic gradient in the rates, with the steepest gradient being for diabetes among those aged 25–64 years. The socioeconomic variation generally exists only among the adult age groups; few significant differences appear among children and young people.

Table 5.7: Prevalence of selected chronic diseases by age group and quintile of socioeconomic disadvantage, 2001

Age group and chronic disease	Rate ^(a)	Rate ratio				
		Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
0–14 years						
Mental and behavioural problems ^(b)	66.0	1.00	1.04	1.10	1.12	1.52*
Respiratory system	218.1	1.00	1.07	1.05	1.11	0.99
Asthma	133.6	1.00	1.10	1.12	1.25*	1.12
15–24 years						
Mental and behavioural problems ^(b)	102.8	1.00	1.02	0.97	1.08	1.28
Respiratory system	333.7	1.00	1.04	1.12	1.09	1.00
Asthma	162.6	1.00	0.82	1.14	1.02	1.00
Bronchitis/emphysema	17.0	1.00 ^(c)	1.32 ^(c)	1.66 ^(c)	1.94 ^(c)	1.97 ^(c)
Musculoskeletal system ^(d)	190.9	1.00	1.11	1.00	1.08	0.94
25–64 years						
Diabetes mellitus	22.3	1.00	1.37	1.67*	1.72*	2.28*
Mental and behavioural problems ^(b)	110.9	1.00	1.05	1.20*	1.36*	1.67*
Circulatory system	174.9	1.00	1.04	0.97	1.15*	1.28*
Hypertensive disease	97.5	1.00	1.12	1.01	1.24*	1.54*
Respiratory system	329.6	1.00	1.00	0.99	0.99	1.01
Asthma	103.9	1.00	1.10	0.99	1.19*	1.14
Bronchitis/emphysema	34.3	1.00	0.97	1.14	1.55*	1.70*
Digestive system	80.7	1.00	1.03	1.07	1.12	1.37*
Musculoskeletal system ^(d)	398.4	1.00	1.10*	1.16*	1.16*	1.22*
Arthritis	146.2	1.00	1.18*	1.32*	1.24*	1.56*
65 years and over						
Diabetes mellitus	89.8	1.00	1.13	1.14	1.52*	1.56*
Mental and behavioural problems ^(b)	72.2	1.00	1.21	1.62*	1.67*	1.56*
Circulatory system	565.9	1.00	1.09	1.06	1.10	1.19*
Respiratory system	314.4	1.00	1.03	0.87	0.95	1.22*
Musculoskeletal system ^(d)	636.7	1.00	1.02	1.06	1.03	1.08
Arthritis	465.7	1.00	0.98*	1.10*	1.00	1.14*

* Indicates the rate in this quintile is statistically significantly different from the rate in Quintile 1.

(a) Rate per 1,000 population.

(b) May include self-diagnosed mental and behavioural problems as well as problems diagnosed by a medical practitioner.

(c) Based on rates with a standard error of between 25% and 50%. These results should be used with caution.

(d) Includes diseases of the connective tissue.

Notes

1. Based on self-reported information. Information for children aged 0–14 years was obtained by parental report.

2. Respondents could report more than one chronic disease.

3. Quintile 1 represents the least disadvantaged areas; Quintile 5 represents the most disadvantaged areas.

4. The rate ratio for each quintile is calculated as the rate in that quintile divided by the rate in Quintile 1.

Source: Glover et al. 2004.



Socioeconomic variation in mortality from chronic diseases

There are notable differences in mortality in Australia when analysed by socioeconomic status, with the lowest mortality rates in the least disadvantaged areas and the highest in the most disadvantaged areas (Glover et al 2004). Deaths with a chronic disease as the underlying cause of death also show a strong relationship with socioeconomic status (Table 5.8), a relationship that is substantially stronger for premature deaths.

Table 5.8: Mortality from selected chronic diseases by quintile of socioeconomic disadvantage, all ages, 2001 to 2003

Underlying cause of death	Sex	Rate ^(a)	Standardised mortality ratio (SMR)				
			Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Coronary heart disease	Males	179.2	1.00	1.09*	1.24*	1.25*	1.38*
	Females	103.5	1.00	1.32*	1.71*	1.87*	2.13*
Cerebrovascular disease	Males	66.8	1.00	1.03	1.08*	1.09*	1.16*
	Females	61.3	1.00	0.99	0.99	1.02	1.01
Lung cancer	Males	52.8	1.00	1.21*	1.36*	1.45*	1.56*
	Females	23.2	1.00	1.10*	1.28*	1.18*	1.32*
Colorectal cancer	Males	29.3	1.00	1.08*	1.15*	1.10*	1.07
	Females	19.5	1.00	1.12*	1.11*	1.07	1.07
Diabetes	Males	21.6	1.00	1.28*	1.37*	1.34*	1.78*
	Females	13.4	1.00	1.42*	1.50*	1.51*	2.08*
COPD ^(b)	Males	40.1	1.00	1.23*	1.37*	1.45*	1.71*
	Females	19.3	1.00	1.10*	1.25*	1.23*	1.40*
Chronic kidney disease	Males	14.9	1.00	1.15*	1.15*	1.14*	1.32*
	Females	10.8	1.00	1.26*	1.16*	1.30*	1.56*

* Indicates the rate in this quintile is statistically significantly different from the rate in Quintile 1.

(a) Rate per 100,000 population, age-standardised to the Australian population at 30 June 2001.

(b) COPD = chronic obstructive pulmonary disease.

Notes

1. Quintile 1 represents the least disadvantaged areas; Quintile 5 represents the most disadvantaged areas.
2. The SMR for each quintile is a ratio of the number of deaths that were observed in that quintile compared with the number of deaths that would be expected if people in that quintile experienced the same mortality rates as people in Quintile 1.

Source: AIHW National Mortality Database.

Using coronary heart disease (CHD) as an example, there is a notable differential (38%) in male mortality rates at all ages between the most disadvantaged and the least disadvantaged areas (Table 5.9). The differential increases to 75% when deaths before age 75 are considered, and to 98% for male deaths before age 65. For females of all ages, the differential in CHD mortality rates between the most disadvantaged and least disadvantaged areas is 24%. This increases to 113% for deaths before age 75, and a substantial 186% for deaths before age 65.

The approximately 7,700 male and 1,900 female deaths from CHD before age 65 are clearly premature, and represent a considerable loss of productive life. The burden of premature CHD mortality substantially increases in the lowest socioeconomic group. This socioeconomic variation in premature mortality (deaths before 65 years of age) exists for several chronic diseases including cerebrovascular disease, lung cancer, COPD, diabetes and kidney disease (Table 5.10).

Table 5.9: Mortality from coronary heart disease (underlying cause of death) by quintile of socioeconomic disadvantage, 2001 to 2003

Age at death	Deaths		Standardised mortality ratio (SMR)				
	Number	Rate ^(a)	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Males							
All ages	41,277	179.2	1.00	1.09*	1.24*	1.25*	1.38*
< 75 years	16,517	61.3	1.00	1.22*	1.44*	1.54*	1.75*
< 65 years	7,721	30.1	1.00	1.24*	1.54*	1.71*	1.98*
Females							
All ages	36,438	103.5	1.00	1.07*	1.14*	1.13*	1.24*
< 75 years	5,663	20.3	1.00	1.32*	1.71*	1.87*	2.13*
< 65 years	1,872	7.4	1.00	1.36*	2.18*	2.38*	2.86*

* Indicates the rate in this quintile is statistically significantly different from the rate in Quintile 1.

(a) Rate per 100,000 population, age-standardised to the Australian population at 30 June 2001.

Notes

1. Quintile 1 represents the least disadvantaged areas; Quintile 5 represents the most disadvantaged areas.

2. The SMR for each quintile is the ratio of the number of deaths that were observed in that quintile compared with the number of deaths that would be expected if people in that quintile experienced the same mortality rates as people in Quintile 1.

Source: AIHW National Mortality Database.

Table 5.10: Premature mortality from selected chronic diseases by quintile of socioeconomic disadvantage, deaths before 65 years of age, 2001 to 2003

Underlying cause of death	Sex	Rate ^(a)	Standardised mortality ratio (SMR)				
			Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Coronary heart disease	Males	30.1	1.00	1.24*	1.54*	1.71*	1.98*
	Females	7.4	1.00	1.36*	2.18*	2.38*	2.86*
Cerebrovascular disease	Males	5.8	1.00	1.13	1.27*	1.36*	1.60*
	Females	12.2	1.00	1.28*	1.47*	1.60*	1.93*
Lung cancer	Males	13.6	1.00	1.38*	1.76*	1.90*	2.09*
	Females	8.2	1.00	1.25*	1.53*	1.38*	1.65*
Colorectal cancer	Males	8.1	1.00	1.12	1.20*	1.28*	1.19*
	Females	5.7	1.00	1.16	1.23*	1.20*	1.08
Diabetes	Males	4.0	1.00	1.42*	1.80*	1.78*	2.56*
	Females	2.0	1.00	1.20*	1.89*	2.26*	3.37*
COPD ^(b)	Males	3.2	1.00	1.74*	2.18*	2.23*	2.69*
	Females	2.7	1.00	1.60*	2.12*	2.53*	2.97*
Chronic kidney disease	Males	1.5	1.00	1.04	1.32*	1.49*	1.89*
	Females	1.0	1.00	1.90*	2.01*	2.56*	3.69*

* Indicates the rate in this quintile is statistically significantly different from the rate in Quintile 1.

(a) Rate per 100,000 population, age-standardised to the Australian population at 30 June 2001.

(b) COPD = chronic obstructive pulmonary disease.

Notes

1. Quintile 1 represents the least disadvantaged areas; Quintile 5 represents the most disadvantaged areas.

2. The SMR for each quintile is the ratio of the number of deaths that were observed in that quintile compared with the number of deaths that would be expected if people in that quintile experienced the same mortality rates as people in Quintile 1.

Source: AIHW National Mortality Database.



Chronic diseases and risk factors among Indigenous Australians

Many reports have highlighted the poor health status of Aboriginal and Torres Strait Islander peoples (AIHW 2004a; AMA 2005; ABS & AIHW 2005). A frequently used indicator of poor health is life expectancy at birth, with the latest ABS estimates indicating a gap of 17 years between Indigenous people and other Australians, for both males (59.4 years compared with 76.6 years) and females (64.8 years compared with 82.0 years). This gap is reflected in a higher standardised mortality ratio for all causes of death of 2.8 for both Indigenous males and females in 1999 to 2003 (ABS & AIHW 2005).

Some of this burden of ill health is attributable to higher death rates from infectious diseases and from injuries and poisonings, with Indigenous males having SMRs of 5.3 and 3.0 respectively for these causes of death; for females the ratios are 5.4 and 2.9. But Indigenous Australians also suffer disproportionately from the main chronic diseases, including those that are the major causes of death. For example, the SMRs for diseases of the circulatory system (including CHD and stroke) are 2.9 for males and 2.5 for females; for neoplasms (including cancers) the ratios are 1.5 for both sexes; for respiratory system diseases (including COPD) they are 4.0 and 3.5; and for endocrine, nutritional and metabolic diseases (including diabetes) they are 7.5 and 10.5 (ABS & AIHW 2005).

Indigenous Australians also experience higher levels of disability than do other Australians. In 2002, 36% of Indigenous people aged 15 years and over had a disability or long-term health condition, including 8% with a profound or severe core activity limitation, meaning that they always or sometimes needed assistance with core activities of daily living (self-care, mobility and communication). Although not strictly comparable to similar estimates for the general Australian population, these figures indicate that Indigenous peoples were at least twice as likely to have a profound or severe core activity limitation as other Australians (ABS & AIHW 2005).

Explanations for the high levels of ill health among Indigenous Australians often begin with adverse socioeconomic conditions compared with general Australian standards, including lower incomes, poorer educational outcomes and lower rates of home ownership. Other factors that have also been identified as contributing to this situation include poor housing, exposure to violence, and 'the extent of control and perceptions of mastery in the workplace and wider society' (AIHW 2004a:195). In addition, Indigenous people experience higher exposure to 'life stressors' such as the death of a family member or close friend, overcrowding at home, alcohol and other drug problems, serious illness or disability, and not being able to get a job (ABS & AIHW 2005).

These social, psychological and environmental factors often affect health status and outcomes. This is particularly the case for chronic diseases, for which these risk factors have well-established connections.

Variations in the prevalence of lifestyle risk factors by Indigenous status

Information on the self-reported prevalence of risk factors among Indigenous Australians is available from the National Health Surveys for the behavioural risk factors, including smoking, risky alcohol consumption, poor nutrition and lack of exercise. Self-reported excess weight is also collected in these surveys. However, data on the prevalence of the biomedical risk factors high blood pressure and high blood cholesterol are not available nationally.

The 2001 NHS found that Indigenous Australians had poorer profiles than did other Australians for nearly all of these risk factors (Table 5.11). A major example is tobacco smoking, which contributes to most chronic diseases. Smoking had declined among the non-Indigenous population to 22% by 2001, but nearly half (49%) of Indigenous Australians aged 18 and over were current daily smokers.

Table 5.11: Age-standardised prevalence of selected health risk factors by Indigenous status, persons aged 18 years and over, 2001

Risk factor	Indigenous Australians	Other Australians
	(per cent)	
Current daily smoker	49	22
Alcohol consumption		
High risk	7	4
Risky or high risk	12	11
Exercise level ^(a)		
Sedentary	43	30
Sedentary or low	73	69
Body mass index		
Obese	31	16
Overweight or obese	63	50
Inadequate fruit intake ^(a)	59	47
Inadequate vegetable intake ^{(a)(b)}	63	70

(a) Data collected for non-remote areas only.

(b) Daily intake of vegetables of three serves or less (the current standard measure of four serves or less could not be reported from the 2001 NHS).

Source: ABS 2002b.

In the 2001 NHS, over half (58%) of the Indigenous peoples reported that they did not consume alcohol in the week before the interview, compared with 38% of other Australians (ABS 2002b). The levels of risky alcohol consumption (five or more standard drinks per day for males, three or more standard drinks per day for females) were similar for both Indigenous (12%) and other Australians (11%). However, Indigenous Australians were more likely to consume alcohol at 'high risk' levels (seven or more standard drinks per day for males, five or more standard drinks per day for females), 7% compared with 4% for other Australians.

A major health problem for all Australians and particularly for Indigenous peoples is the nexus of diabetes, CHD, cerebrovascular disease and kidney disease. Major contributors to these diseases are high blood pressure and high blood cholesterol, for which little data from the Indigenous population are available. Another cause of these diseases is



excess weight, which itself is often a function of lack of exercise and poor diet, and some indication of these risk factors is available from the NHS.

Half of all Australian adults reported in the 2001 NHS that they carried excess weight (BMI of 25 and above). Among Indigenous adults, this figure was 63%. At the higher end of the BMI scale, 31% of Indigenous adults and 16% of other Australian adults were rated as obese (BMI of 30 and above). Similarly, low levels of exercise were reported by the vast majority (nearly 70%) of *all* Australian adults. However, very low levels ('sedentary') were more likely to be reported by Indigenous adults, 43% compared with 30% of other Australian adults.

Over half (59%) of Indigenous adults and nearly half (47%) of other Australian adults reported inadequate consumption of fruit. Even higher proportions reported inadequate consumption of vegetables (defined here three serves or less, not four serves or less as in other chapters): 63% of Indigenous adults and 70% of other Australian adults.

Other information from the 2001 NHS, on types of milk consumed and addition of salt to food after cooking, indicates that poor diet is a factor in contributing to the higher levels of excess weight in the Indigenous population (ABS 2002b).

Variations in the prevalence of chronic diseases by Indigenous status

Information on the prevalence of specific chronic diseases from the National Health Surveys is limited because of the small sample sizes used, restricting most analyses to major disease groupings. The figures for these groupings from the 2001 NHS indicate that Indigenous people were more likely to report most of the major groupings of chronic diseases, the one exception being eye and vision problems. However, the differences between the two populations were not very large for most diseases (Table 5.12).

Table 5.12: Age-standardised prevalence of selected chronic diseases by Indigenous status, persons aged 18 and over, 2001

Disease/condition	Indigenous Australians	Other Australians
	(per cent)	
Eye/sight problems	46	51
Musculoskeletal diseases	35	32
Arthritis	16	7
Diseases of the respiratory system	33	30
Asthma	17	12
Circulatory problems/diseases	19	17
Ear/hearing problems	18	14
Endocrine, nutritional and metabolic conditions	15	9
Diabetes mellitus	11	3
Diseases of the nervous system:	10	8
Digestive diseases	7	7

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

Source: ABS & AIHW 2005.

The 2001 NHS found that three specific chronic diseases that are highly prevalent in Australia — asthma, arthritis and diabetes — were more commonly reported by Indigenous Australians. The difference was greatest for arthritis, with 16% of Indigenous adults reporting this condition compared with only 7% of other Australians. A significant difference was also observed for diabetes, with 11% of Indigenous Australians and only 3% of other Australians having this condition. Other studies suggest that the prevalence of diabetes may be as high as 30% in some Aboriginal communities (AIHW 2002a).

Asthma — one of the most commonly reported diseases in the NHS — affects 17% of Indigenous adults compared with 12% of other Australian adults. Among Indigenous adults, the prevalence of asthma was much higher among females than among males. It was also significantly higher for Indigenous women compared with other Australian women. In fact, among Indigenous women, the prevalence was higher in older adults than in children, an age distribution of asthma that was markedly different from the age distribution in other Australian women (AIHW: ACAM 2005). Asthma was more prevalent among Indigenous children, but the differences between Indigenous and non-Indigenous children were significant only in the youngest age group, 0–2 years, an age at which the diagnosis of asthma is uncertain (AIHW: ACAM 2005).

Chronic kidney disease (CKD) has been highlighted as a particular health concern for Indigenous Australians (ABS & AIHW 1999; AIHW 2005b). Although no national data on chronic kidney disease in Indigenous Australians are available, several studies have discovered high rates of CKD and indicators of kidney damage among Indigenous communities (AIHW 2005b). One study found that 12% of adults in a remote Aboriginal community in the Northern Territory had reduced kidney function and a further 36% had evidence of kidney damage (McDonald et al. 2003).

In addition to the risk factors noted above, diabetes and preventable infections are also common in many Indigenous communities and have been associated with kidney impairment in this population. This, along with their poorer socioeconomic status and often remote location leading to poor access to health services, contributes to the increased rates of CKD and other chronic diseases among Indigenous Australians. In particular, it is believed that the high incidence of streptococcal skin and throat infections among Indigenous Australians contributes to increased risk of glomerulonephritis, one of the main causes of CKD (Chadban & Atkins 2005). Low birthweight is also common among Indigenous Australians, and there is evidence that this may be associated with greater risk of kidney disease, independent of other risk factors (Hoy et al. 1998).

Variations in chronic disease mortality by Indigenous status

The analysis of mortality data for the Indigenous population of Australia is limited to the death records from Western Australia, South Australia, the Northern Territory and Queensland. This is because only these jurisdictions have a sufficient quality of identification of Indigenous status in their death records (ABS & AIHW 2003). Furthermore, because of the small populations involved, it is necessary to combine the records from the most recent three years (2001 to 2003), and to use standardised mortality ratios (SMRs) to compare the death rates with those of other Australians.



Indigenous Australians have much higher death rates compared to non-Indigenous Australians, with the SMR for males being 2.9 and for females 2.6. Among the major chronic diseases that cause large numbers of deaths, the SMRs are all greater than these figures, with the exception of colorectal cancer (Table 5.13), indicating that chronic diseases are an even greater problem among Indigenous Australians than among other Australians.

Table 5.13: Standardised mortality ratios for chronic diseases, Indigenous Australians compared with other Australians, 2001 to 2003

Cause of death	Males	Females	Persons
Coronary heart disease	4.8	5.3	5.0
Cerebrovascular disease	4.3	4.3	4.3
Lung cancer	3.4	4.0	3.6
Colorectal cancer	1.7	1.7	1.7
Diabetes	11.9	16.5	13.9
COPD	5.9	5.7	5.8
Chronic kidney disease	7.2	8.1	7.7

Notes

1. Standardised mortality ratios (SMRs) are the comparison of the number of observed Indigenous deaths and the number of deaths expected if they experienced the same rates as the non-Indigenous population.
2. Data are limited to Western Australia, South Australia, Northern Territory and Queensland.
3. All the SMRs in this table are statistically significant ($p < 0.05$).

Source: AIHW National Mortality Database.

These mortality data indicate that the nexus mentioned earlier — of diabetes, CHD, cerebrovascular disease and chronic kidney disease — is a particularly major health issue for Indigenous Australians. The SMR for diabetes is 13.9, indicating that the death rate from this disease for Indigenous Australians is nearly 14 times greater than for other Australians. Chronic kidney disease is also a disproportionately large problem, with an SMR of 7.7. The major diseases of the circulatory system — CHD and cerebrovascular disease — have SMRs of 5.0 and 4.3 respectively.

Indigenous females appear to be more disadvantaged in terms of chronic disease mortality than Indigenous males. This is not because Indigenous females have higher death rates from chronic diseases than Indigenous males; rather it is because the gap between Indigenous and other Australian females is wider than it is for males. Most striking are the Indigenous female SMRs for diabetes (16.5) and chronic kidney disease (8.1).

The effect on Indigenous peoples of higher mortality from chronic diseases can also be seen in their higher levels of premature mortality, as measured by years of life lost (YLL) for each chronic disease (Table 5.14). The YLL for each of these diseases are higher for Indigenous people, both males and females, particularly for chronic kidney disease and CHD, for which the gaps between Indigenous and other Australians are around 10 to 15 years. This indicates that not only are Indigenous people more likely to die from these diseases, but also they are more likely to die at younger ages than are other Australians.

Table 5.14: Average years of life lost because of chronic diseases, Indigenous and other Australians, 2001 to 2003

Cause of death	Males		Females	
	Indigenous Australians	Other Australians	Indigenous Australians	Other Australians
Coronary heart disease	21.2	12.1	18.6	8.6
Cerebrovascular disease	15.0	10.0	13.7	8.8
Lung cancer	19.0	14.2	24.0	16.9
Colorectal cancer	16.3	14.7	20.6	15.2
Diabetes	22.9	19.7	14.2	11.2
COPD	15.0	10.0	18.9	12.0
Chronic kidney disease	26.7	9.8	25.3	9.2

Notes

1. Years of life lost = the expected years of life remaining at age of death for males and females in the general Australian population.
2. Data are limited to Western Australia, South Australia, Northern Territory and Queensland.

Source: AIHW National Mortality Database.

Highlights: Regional, socioeconomic and indigenous differences

Geographical location

- In 2001, the rate of risky alcohol use of people living in regional areas was 22% higher than the rate in major cities.
- Compared with major cities, rates were also higher in regional areas for smoking (11% higher), excess weight (7% higher) and being sedentary (5% higher).
- Arthritis is more likely to be reported in inner and outer regional areas than in major cities.
- Males in major cities are more likely to report asthma and diabetes than males in regional areas.
- Mortality rates for coronary heart disease, COPD and diabetes tend to increase with increasing remoteness for both sexes.

Socioeconomic status (SES)

- In 2001, when compared with least disadvantaged areas, persons living in more disadvantaged areas had significantly higher levels of tobacco smoking, physical inactivity and obesity. For males significantly higher levels of risky alcohol consumption were evident in the most disadvantaged areas than in the least disadvantaged areas.

continued...



Highlights (cont'd): Regional, socioeconomic and indigenous differences

- Compared with those living in least disadvantaged areas, significantly higher prevalence of diabetes, mental and behavioural problems, diseases of the circulatory system, asthma, bronchitis/emphysema and arthritis can all be observed in the more disadvantaged areas.
- In 2001, there was significantly higher mortality for coronary heart disease, lung cancer, diabetes, COPD, chronic kidney disease and male cerebrovascular disease for those in more disadvantaged areas than in the least disadvantaged areas.

Indigenous status

- In 2001, 49% of Indigenous adults reported smoking compared with 22% of other Australian adults.
- Indigenous adults were also more likely to drink alcohol at high-risk levels (7%) compared with other Australian adults (4%).
- Although excess weight is an issue for half of all Australians, this figure increased to 63% for Indigenous Australians in 2001.
- Inadequate fruit consumption was prevalent for both Indigenous (59%) and other (47%) Australians, as was consumption of fewer than four serves of vegetables (63% for Indigenous Australians and 70% for other Australians (note that in Chapter 3 the measure is four serves or less)).
- In 2001, asthma, arthritis and diabetes were more commonly reported for Indigenous than other Australians.
- Large differences in mortality by Indigenous status can be observed for diabetes (14 times the rate for other Australians), chronic kidney disease (8 times), COPD (6 times) and coronary heart disease (5 times).