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A *snapshot* of men's health in regional and remote Australia

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Contents

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Abbreviations

ALLS	Adult Literacy and Life Skills Survey
ASGC	Australian Standard Geographical Classification
ASGC RA	Australian Standard Geographical Classification Remoteness Areas classification
ABS	Australian Bureau of Statistics
BEACH	Bettering the Evaluation and Care of Health
CAPS	Coding Atlas for Pharmaceutical Substances
CD	Census collection district
COPD	chronic obstructive pulmonary disease
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition
ERP	estimated resident population
GP	general practitioner
IR	*Inner regional*
IRSD	Index of Relative Socioeconomic Disadvantage
ICD-10	International Statistical Classification of Diseases, and Related Health Problems, 10th Revision
ICPC-2	International Classification of Primary Care—2nd edition
MC	*Major cities*
MVA	motor vehicle accident
NCSCH	National Cancer Statistics Clearing House
NDSHS	National Drug Strategy Household Survey
NHS	National Health Survey
OECD	Organisation for Economic Co-operation and Development
OR	*Outer regional*
R	*Remote*
RA	Remoteness Areas
RFE	reason for encounter
SEIFA	Socio-Economic Indexes for Areas
SES	socioeconomic status
SSD	Statistical Subdivision
VR	*Very remote*
WHO	World Health Organization
WMH-CIDI 3.0	World Mental Health Composite International Diagnostic Interview—version 3.0

Summary

In late 2008, the Australian Government announced its intention to develop Australia's first National Men's Health Policy, which will have a focus on a number of groups including men in rural areas. Drawing on several data sources, this report provides a snapshot of the health of men in rural Australia compared with urban areas.

Why rural men?

There is a strong relationship between poor health and social and economic disadvantage. Compared with urban areas, rural regions of Australia contain a larger proportion of people living in areas of socioeconomic disadvantage. This fact, combined with the generally poorer health status of men compared with women, justifies the specific consideration of rural men in this report.

Room for improvement in the health of rural men

This report confirms previous findings that rural men are more likely than their urban counterparts to experience chronic conditions and health risk factors.

In 2004–06, male death rates increased with remoteness. Compared with *Major cities*, death rates ranged from 8% higher in *Inner regional* areas to up to 80% higher in *Very remote* areas.

Several areas of health continue to be of particular concern for rural men. Four of these are highlighted below.

Cardiovascular disease and diabetes

Death rates from these diseases increased with remoteness. Cardiovascular diseases were responsible for nearly a third of the elevated male death rates outside *Major cities*.

Male death rates from diabetes were 1.3 times as high in *Inner regional* areas and 3.7 times as high in *Very remote* areas as compared with *Major cities*.

Alcohol and other drugs

Men living outside *Major cities* were more likely to report daily smoking and risky or high-risk alcohol use than their counterparts in *Major cities*. They were also more likely to have experienced a substance use mental disorder throughout their lifetime. The incidence of head and neck cancers and lip cancers, two groups of cancers associated with increased smoking and alcohol consumption, was also higher outside *Major cities*.

Injury

Male death rates due to injury and poisoning increased with remoteness; rates in *Very remote* areas were 3.1 times as high as *Major cities*. Similarly, men living outside *Major cities* were 18% more likely to report a recent injury.

Health literacy

In 2006, men living in *Inner regional* and *Outer regional/Remote* areas were 22% less likely than men in *Major cities* to possess an adequate level of health literacy.

1 Introduction

Background

The health challenges facing men have recently been highlighted by the Australian Government's development of a National Men's Health Policy (the Policy). The Policy's aim is to improve the health of Australian men throughout their lives. It will focus upon reducing the barriers men face in accessing health services, improving male-friendly health care, addressing the reluctance that men may feel in seeking treatment and raising awareness of preventable health problems (DoHA 2008). In these overarching objectives, attention has been drawn to communities of men in Australia with the poorest levels of health. Men in regional and remote regions have been recognised as a group with distinct and special needs.

In most areas of health, men have poorer outcomes than women. This is also true in the rural context where men share a higher burden of disease than women (Begg et al. 2007; AIHW 2007). While biological factors may explain some differences in health outcomes between men and women, there is a growing awareness of the role played by social determinants of health, such as education, cultural practices and environmental factors. In particular, cultural norms and values influence the way men think about their health and seek help for physical and mental problems.

This report provides a snapshot of the health status of men in rural Australia. While the findings are from a limited number of data sources, they provide a useful starting point to monitor any changes to the health status of rural men throughout the course of the Policy.

Why men?

Research has consistently shown a sex differential in morbidity and mortality. The most publicised statistic is men's lower life expectancy—approximately 5 years less than females (AIHW 2008a). After adjusting for age, in 2006 the mortality rate for men was approximately 50% higher than for women (731 compared with 493 deaths per 100,000) (AIHW 2008b). In particular, rates of death for men of working age (25–64 years) were substantially higher than their female counterparts.

In 2003, men experienced more of the disease burden than females for cancers, diabetes, cardiovascular disease, chronic obstructive pulmonary disease (COPD) and injuries (including suicide) (Begg et al. 2007). Compared with females, men also experienced a higher burden of health risk factors such as misuse of alcohol, and use of tobacco and drugs; occupational exposures and hazards; physical inactivity; high blood pressure and cholesterol; high body weight and low consumption of fruit and vegetables (Begg et al. 2007). In Australia, men are also less likely than women to report their health as good or better (ABS 2006a). Interestingly, this is inconsistent with the pattern observed in similar developed countries where men rate their health as good or better more often than women (OECD 2009).

Use of appropriate health care services is critical for disease prevention and management, yet there is a growing awareness that men and women have quite different health seeking behaviours (Smith, Braunack-Mayer & Wittert 2006). In Australia, there are much lower levels of health service use among males compared with females (Bayram et al. 2003; DoHA 2005; AIHW & DoHA 2008). While men are not necessarily less interested in or concerned about their health, they are generally less likely to see

themselves as being at risk of illness or injury (Courtenay 2003) and are more likely to dismiss health symptoms until they become severe or life-threatening (Galdas, Cheater & Marshall 2005).

Social support, especially in times of crisis, is likewise considered important for good health. Research has shown that men have smaller social networks, and more limited support, than women, with high levels of social support associated with positive health practices (Courtenay 2003). It is clear that sociocultural factors, combined with generally higher prevalence of disease and risk factors than women, support specific research and policy consideration of men as a population group.

Why men in rural areas?

Over half of *Outer regional*, *Remote*, and *Very remote* residents live in areas of socioeconomic disadvantage, while the corresponding figure in *Major cities* is about one quarter. In general, people who are socially and economically disadvantaged have poorer health outcomes and increased health risk factors (AIHW 2008a). Aboriginal and Torres Strait Islander people, who comprise a greater proportion of remote populations, are particularly socioeconomically disadvantaged compared with other Australians.

Analysis of deaths during 1998–2000 found that men aged 25–64 years in the most socioeconomically disadvantaged group had a mortality rate almost double that of their female counterparts (Furler 2005). Furthermore, there is evidence that the relative disadvantage in the life expectancy of men compared with women is greater in the unskilled/manual category than professional workers (Wilkinson 2005). This is particularly relevant to rural areas where a higher proportion of men are employed in primary production compared with urban areas (see Section 3).

The higher proportion of socioeconomically disadvantaged people in rural areas, combined with the poorer health status of men compared with women, highlights a potential double disadvantage for men living in rural areas. Men's health issues may be compounded by specific barriers accessing services including long working hours, requirements of seasonal work, discomfort in the waiting room environment, privacy issues centering on others not knowing they have visited a service and a fear of knowing their true health status (Buckley & Lower 2002). These barriers exist in addition to the general barriers to access and availability of health services in more remote areas of Australia.

Nonetheless, the focus on men in this publication is not intended to imply that particular health needs do not also exist for rural women. For example, in 2002–04 all-cause mortality rates for women living outside *Major cities* were between 10–70% higher than their counterparts in *Major cities* (AIHW 2007). Women living outside *Major cities* were also more likely to report diabetes, arthritis, asthma and several health risk behaviours such as smoking than their counterparts in *Major cities* (AIHW 2008c).

Purpose and structure of this report

This report provides a snapshot of differences in morbidity and mortality between men in rural and urban areas. A select (rather than exhaustive) list of administrative and population survey data sources has been used. Nonetheless, for the first time this report provides national data on the health literacy of men in rural areas; the association between remoteness, mortality and marital status and the pattern of male mortality across each of Australia's states and territories.

Section 2 of this report describes the methodologies used in analysis. Section 3 provides a brief summary of the unique demographic and socioeconomic characteristics of rural men. Section 4 presents findings on the health status of men living in urban, regional and remote areas, while Section 5

examines men's health problems and their management in the general practice setting. Men's use of other health services, such as hospitals, is beyond the scope of this report. Section 6 explores male death rates across geographic regions and the key causes of male death in rural areas.

Detailed tables and information about data sources and methodology are available in the Appendix. In the majority of cases, the Appendix provides more detailed statistics by geographic region than are presented in the text.

2 Analysis methods

An understanding of the relative health of a population group requires a comparison population. Frequently, the health status of men is compared with women. In this report, the health of rural men is compared with their male counterparts in urban areas, therefore providing insight into inequalities of health which may exist across geographic areas. In general, the term 'men' is used to describe males of all ages.

Classifying remoteness

This report provides analysis of remoteness using the Australian Standard Geographical Classification Remoteness Areas classification (ASGC RA). The ASGC RA allocates one of five remoteness categories to areas—*Major cities*, *Inner regional*, *Outer regional*, *Remote* and *Very remote*. While the ASGC RA provides a useful aggregation of remoteness categories for statistical purposes, the classification of cities and towns to remoteness categories does not always correspond with common perceptions, for example the *Inner regional* category contains cities such as Campbelltown, Hobart and Darwin. Furthermore, areas that are defined as 'remote' may differ dramatically in their location, economic activities, climate and demography. As the five categories are broad, it is likely that health status will vary within each of them. Where appropriate, this aggregated data should be considered alongside specific area statistics.

While analysis by ASGC RA is useful for providing an overview of health differentials between urban and rural Australia, statistics disaggregated to a smaller geographic area can be more useful for state and territory-based health planning. For this reason, mortality data has also been presented at the Statistical Subdivision level (Section 6). For more information on the ASGC see Appendix A.

As Australia's rural population is not uniform, each community and individual will experience health and health care in different ways. The statistics published in this report provide a generalised measure of health status in rural areas overall, and should not be interpreted at an individual level.

Adjusting for different age profiles

In more remote areas of Australia there are proportionally more boys and fewer older men than in *Major cities* (Figure 1). To adjust for this variation, age standardisation has been used to compare health outcomes in rural areas with those in *Major cities* (Sections 4 and 6). In the majority of cases, indirect standardisation, a demographic method commonly used when the population of interest is small and the age-specific rates are unstable, has been used.

Using the example of cancer incidence, the steps of indirect standardisation are outlined below.

Step 1: Identify a standard population (for example, *Major cities*).

Step 2: Calculate age-specific rates of cancer for the standard population.

Step 3: Multiply age-specific rates for the standard population with the population of interest (for example, *Remote* areas) to calculate the number of expected cases of cancer for each age group.

Step 4: Sum the number of expected cases of cancer for each age group to get the total number of expected cancers in rural areas if age-specific rates in *Major cities* applied to that area.

Step 5: Divide the number of observed cases of cancer by the number expected (Step 3) to calculate a standardised rate ratio of observed/expected.

The standardised ratio allows for comparison of the total number of events (for example, number of cancers in *Remote* areas) to the number expected if *Major cities* rates applied to that population. The rate ratio is expressed in terms of 'one rate is X times as high as another' or 'there are X times as many events as expected'. Indirect standardisation is also used to calculate the standardised mortality ratio reported in Section 6. The crude (non-standardised) prevalence and mortality rates are provided in Appendix B.

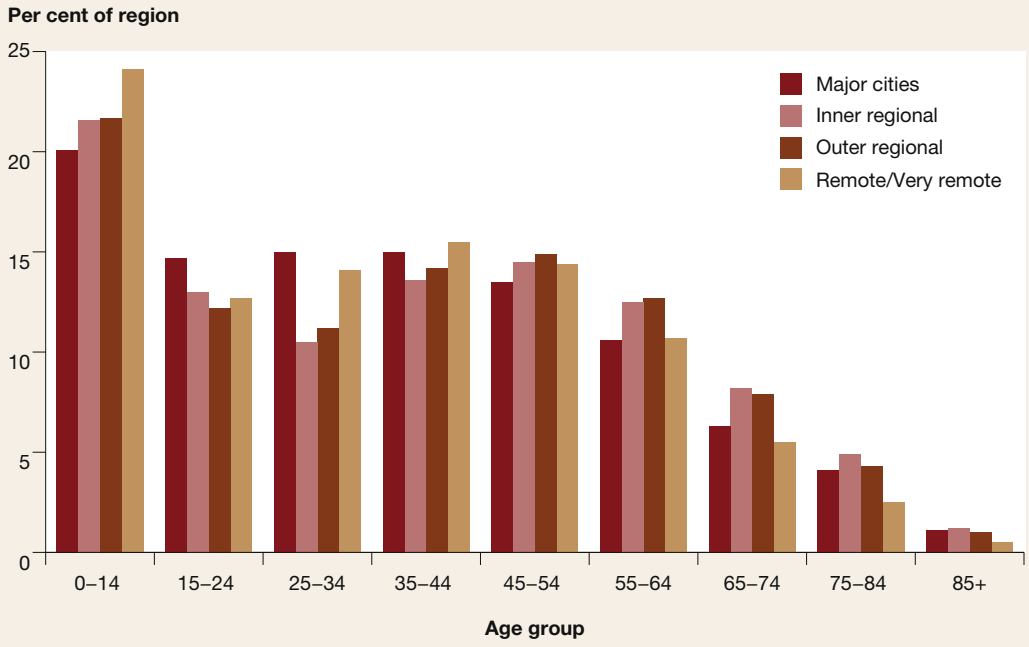
In this report, the statistical significance of differences is identified by non-overlapping 95% confidence intervals. The width of confidence intervals differs systematically with the size of the sample from that category. Less populated, more remote areas are represented by a smaller sample of people than more populated areas such as *Major cities*. Confidence intervals for smaller samples are wider, indicating less precision for the estimates. This means that there is less chance of detecting real differences between the less populated, more remote areas and *Major cities*. The calculation of confidence intervals differs depending on the nature of the data source used (refer to Appendix A for more detail).

3 Men in rural Australia

Characteristics and demographics

In 2006, 3.1 million Australian men lived outside *Major cities* in what are loosely referred to as regional and remote (or rural) areas. This is about one-third (32%) of all Australian men.

The population outside *Major cities* has a number of distinct social and demographic characteristics (Table 1). While males constitute just under half (49%) of the population in *Major cities*, this proportion increases with levels of remoteness. As such, there are more males than females in *Remote* and *Very remote* areas (52% and 53% respectively). In *Remote* and *Very remote* areas there are also proportionally more boys and fewer older men (Figure 1).



Source: Australian Bureau of Statistics (ABS) Census of Population and Housing 2006.

Figure 1: Proportion of males in each age group by ASGC RA, 2006

The proportion of the population who identify as Aboriginal and/or Torres Strait Islander varies considerably with remoteness. While Indigenous Australians make up just over 2% of the total male population, they constitute 5% in *Outer regional* areas, 13% in *Remote* and 42% in *Very remote* regions. This is an important consideration when examining the health statistics of Australians living outside *Major cities*.

Socioeconomic characteristics are also critical in any discussion of health. Labour force participation is fairly even across levels of remoteness although it is slightly higher among men living in *Remote* regions.

Despite the prominence of agriculture in rural Australia, the majority of men living outside *Major cities* actually derive their income from other industry sectors. The highest proportion of men employed in primary production can be found in *Remote* areas (28%) followed by *Very remote* and *Outer regional* areas (both 22%).

After adjusting for age, levels of education are generally lower outside *Major cities*. In 2006, 59% of men in *Major cities* held a non-school qualification compared with 50% of men in *Remote* areas and 44% of men in *Very remote* areas. The proportion of adult males participating in voluntary work for a group or organisation was much higher away from *Major cities*.

Men living outside *Major cities*, particularly those in more remote areas, were more likely to live in lone-person households and less likely to be married (see Section 6 for analysis of mortality by marital status). There were also much lower levels of home ownership in *Remote* (60%) and *Very remote* (42%) regions compared with *Major cities* (70%). Similarly, the proportion of households with internet access was lower outside of *Major cities*.

Culture and language are critical factors in health care planning and delivery. In Australia, 17% of men mostly speak a language other than English at home. This proportion is far higher in *Very remote* (31%) areas compared with *Inner/Outer regional* and *Remote* regions (4–6%) due to the prevalence of Indigenous languages. However, a greater proportion of men who have recently arrived in Australia live in *Major cities* rather than outside of them.

Table 1: Selected sociodemographic characteristics by ASGC RA, 2006

Characteristic	*Major cities*	*Inner regional*	*Outer regional*	*Remote*	*Very remote*	Australia[a]
Men			**Per cent**			
Population living in each area	68.0	19.7	9.6	1.6	0.8	100.0
Proportion of total population who are male	49.1	49.3	50.6	52.2	52.7	49.4
Population in each area who identify as Indigenous	1.1	2.6	5.1	12.6	41.9	2.4
Indigenous population living in each area	32.2	22.1	21.6	8.6	15.1	100.0
Adults in the labour force (employed/looking for work)[b]	72.7	71.4	72.9	75.5	71.3	72.4
Adults employed in agriculture, fishing and forestry[b]	0.9	10.5	21.5	27.9	21.9	6.0
Adults with a non-school qualification[b]	58.8	54.2	50.5	49.9	43.9	56 .9
Adults participating in voluntary work for organisation or group[b]	15.3	20.6	22.9	25.0	21.3	17.3
Population living in lone person households	8.6	9.2	10.8	12.4	9.9	9.0
Adults currently married[b]	50.3	50.5	47.9	44.9	43.5	49.9
Language other than English spoken at home	22.2	3.5	4.6	6.0	30.6	16.6
Population recently arrived in Australia (2001–2005)	4.3	1.1	1.1	1.4	0.9	3.3
Population living in areas classified as highest socioeconomic status[c]	56.0	21.8	17.2	16.9	13.3	44.5
Population living in areas classified as lowest socioeconomic status[c]	26.8	46.3	61.8	56.5	76.8	34.9
Households						
Dwellings with internet connection	66.2	57.7	54.6	53.1	42.0	63.0
Dwellings owned or being purchased	69.2	73.4	70.0	59.8	41.5	69.8

(a) Offshore, shipping and migratory census district areas have been included in the total for Australia.

(b) Directly age-standardised to the 2001 Australian population.

(c) These figures are based on the Index of Relative Socioeconomic Disadvantage, one of the four Socioeconomic Indexes for Areas developed by the ABS. 'Lowest socioeconomic status' includes people living in the bottom 40% of all areas and 'highest socioeconomic status' includes people living in the highest 40% of areas.

Note: 'Adult' refers to a person aged 15 years or over.

Source: ABS Census of Population and Housing 2006.

Socioeconomic status and the rural–urban health gap

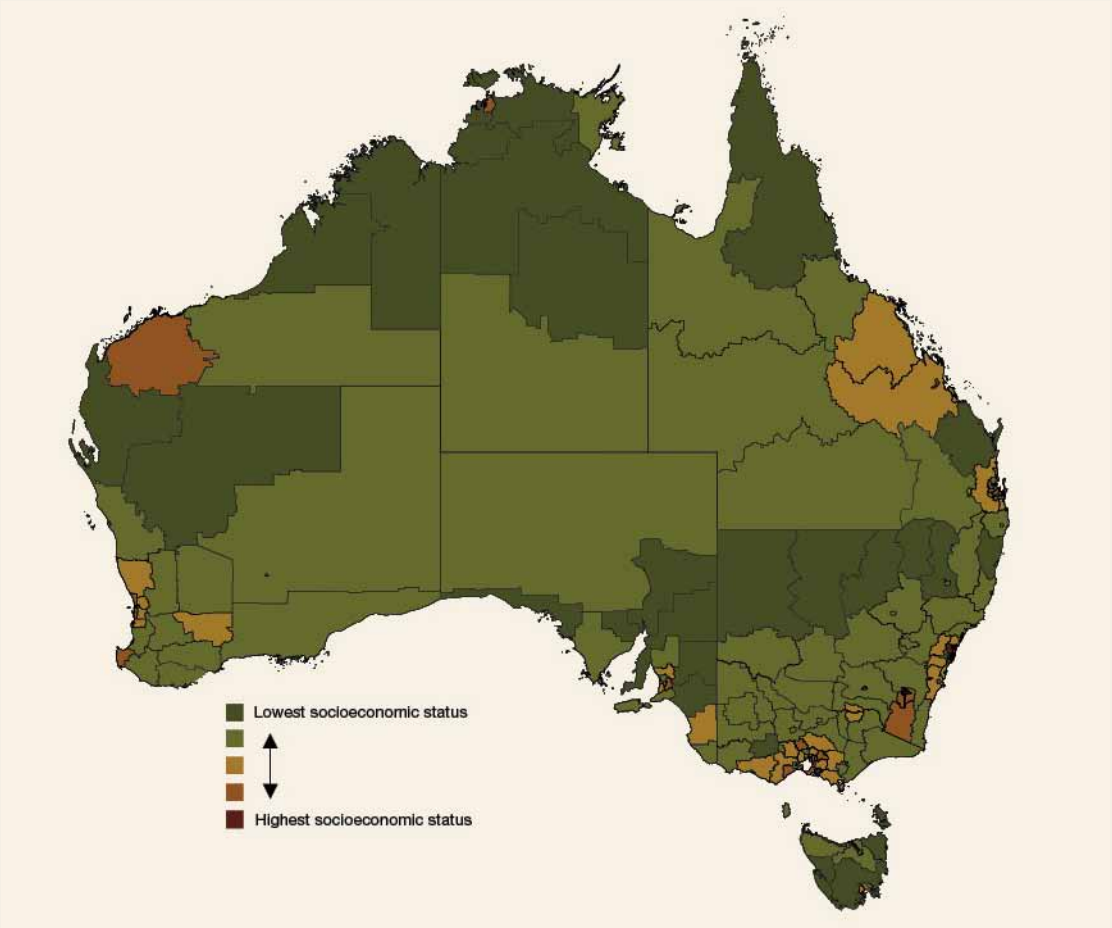
A person's access to material and social resources, and their ability to participate in society, will vary depending on their position in the socioeconomic hierarchy. Several studies have observed that groups who are socioeconomically disadvantaged have reduced life expectancy, increased disease incidence and prevalence, higher levels of risk factors for ill-health, greater rates of avoidable mortality and poorer overall health status (for example, Turrell et al. 1999; Draper et al. 2004; Glover et al. 2004). People on the lower levels of the socioeconomic hierarchy are more likely to make use of primary and secondary health services (for example, doctors and hospitals) but are less likely to use preventive health services (for example, dentists, immunisation and cancer screening tests) (ABS 2006a). These trends exist on a 'social gradient' from the poorest to the wealthiest in society so that as socioeconomic status improves, health status is likely to improve as well. Socioeconomic status can be measured in a number of ways. The Socio-Economic Indexes for Areas (SEIFA) Index of Relative Socioeconomic Disadvantage (IRSD) is commonly used in Australia. The IRSD summarises 17 variables associated with the social and economic resources of people and households in an area. These include low income, low educational attainment, high unemployment, jobs in relatively unskilled positions, a high proportion of people identifying as Indigenous and high levels of housing stress (Baker & Adhikari 2007).

In 2006, over half of *Outer regional, Remote* and *Very remote* residents lived in areas classified as lowest socioeconomic status (SES), compared with around one-quarter of people in *Major cities* (Table 1). In *Very remote* areas this figure was 77%. Figure 2 presents a geographical representation of socioeconomic status by Statistical Subdivision (SSD), an ABS spatial unit. Where possible, these units are consistent with the boundaries of Local Government Areas. Figure 2 illustrates the pattern of increasing socioeconomic disadvantage with remoteness. However, while there is a larger proportion of the lowest SES areas in more remote regions compared to *Major cities*, pockets of low and high SES exist in both areas. For example, there are areas of highest SES in *Major cities* (such as northern Sydney; Boroondara in Melbourne; central Perth and parts of Canberra) and rural areas (such as Fortescue and Vasse, which includes Margaret River, in Western Australia; Mt Lofty Ranges in South Australia; and the Litchfield Shire in the Northern Territory). There are also many SSDs in *Major cities* of lowest SES (such as Fairfield-Liverpool in Sydney; Greater Dandenong City in Melbourne; and northern and western Adelaide).

Different levels of socioeconomic disadvantage may help explain the health gap between urban and rural men. Communities outside *Major cities* generally include a greater proportion of people with lower incomes, lower levels of educational attainment and higher proportions of people of Aboriginal and Torres Strait Islander origin (Dixon & Welch 2000). In 2006, 40% of Indigenous Australians were in the bottom 20% of mean equivalent household incomes. Furthermore, research shows socioeconomic factors may increase the risk of disease among people living outside of *Major cities* and reduce the use of appropriate health care (Beard et al. 2009).

Figure 3 provides a comparison of overall male mortality in 2006 by socioeconomic status and remoteness. Mortality rates for males living in Australia's lowest socioeconomic areas (bottom 40% of all areas) and highest socioeconomic areas (top 40%) are compared with the overall *Major cities* mortality rate.

Compared with the average in *Major cities* (1.00), in all remoteness areas (except *Inner regional* areas) male death rates were higher in the lowest SES areas than in the highest SES areas. In *Inner regional* areas there was a small (not statistically significant) pattern in the opposite direction. These findings are consistent with other research that indicates socioeconomic status may be a major factor when considering mortality in rural areas, although the strength of the relationship requires further analysis.

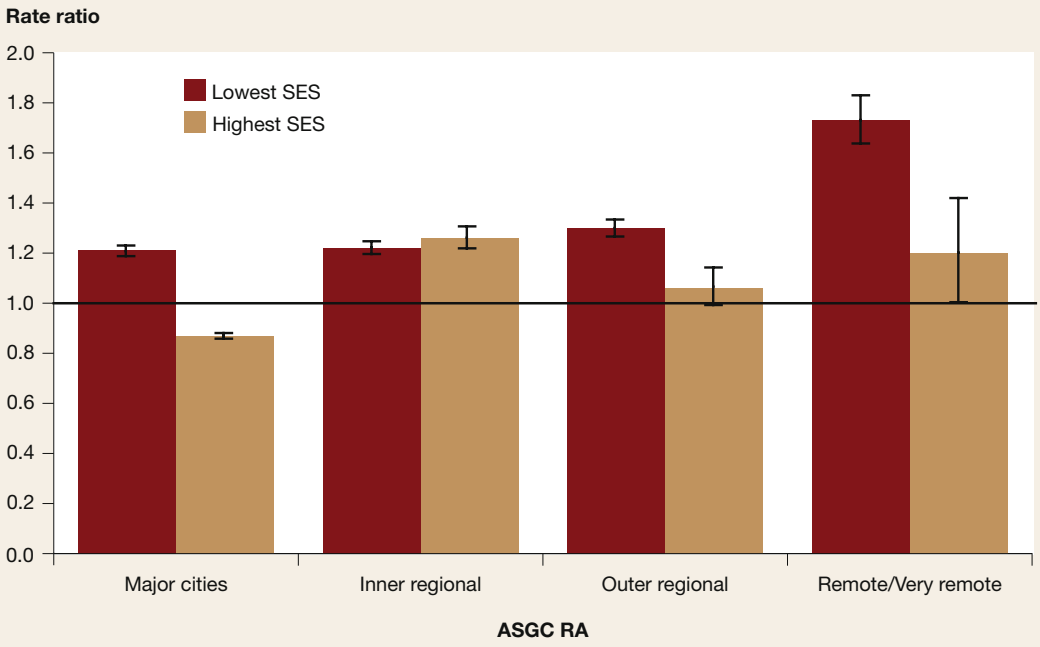


Notes

1. An SSD is defined as a socially and economically uniform region characterised by identifiable links between the inhabitants (ABS 2006b). As SSDs are an aggregation of smaller geographical units (Statistical Local Areas (SLAs)), clusters of advantage or disadvantage may disproportionately affect the SSD's average socioeconomic status. An example of this is the mining town SLA of Roxby Downs in the Far North SSD of South Australia—an area of relatively low disadvantage in an otherwise relatively high disadvantage area.
2. For comparability with analysis in Section 6, 2006 IRSD area-values were applied to 2005 geographic boundaries. As 2005 boundaries are based on the 2001 RA boundaries and 2006 boundaries based on the 2006 RA boundaries this analysis is approximate only (see Appendix A for further information).

Source: ABS Census of Population and Housing 2006.

Figure 2: Geographic areas of Australia classified by SEIFA, aggregated by Statistical Subdivision, 2005



Notes

1. The horizontal line represents the standard mortality rate of *Major cities* in Australia (all socioeconomic quintiles).
2. 'Lowest SES' includes people living in the bottom 40% of all areas and 'Highest SES' includes people living in the highest 40% of areas.
3. Geographic information for deaths has been mapped from 2005 to 2006 geographic boundaries. As 2005 boundaries are based on the 2001 RA boundaries and 2006 boundaries based on the 2006 RA boundaries, this analysis is approximate only (see Appendix A for further information).

Source: AIHW National Mortality Database.

Figure 3: Estimated overall mortality rate ratios (compared with all *Major cities*), by ASGC RA and socioeconomic status, men, 2006

4 The health of men in rural Australia

Data collected through population surveys and administrative sources show that health status varies across Australia. This section compares the health of men living in *Major cities* with men in *Inner regional, Outer regional* and *Remote* areas ('*Other* areas') by examining several health determinants and a range of health conditions. It is important to note that much information on health and health behaviours comes from self-reported data. As such, the ABS National Health Survey (NHS) and National Drug Strategy Household Survey (NDSHS), which rely on self-report, need to be considered with other population and administrative data.

As previously discussed, the overall health status of rural men is influenced largely by the higher proportion of Aboriginal and Torres Strait Islander people in remote areas. While Indigenous data are not provided separately in this section, further information on Indigenous health status by remoteness can be found in the *Aboriginal and Torres Strait Islander Health Performance Framework* (AHMAC 2008) and the AIHW report *Rural, regional and remote health: indicators of health status and determinants of health* (AIHW 2008c).

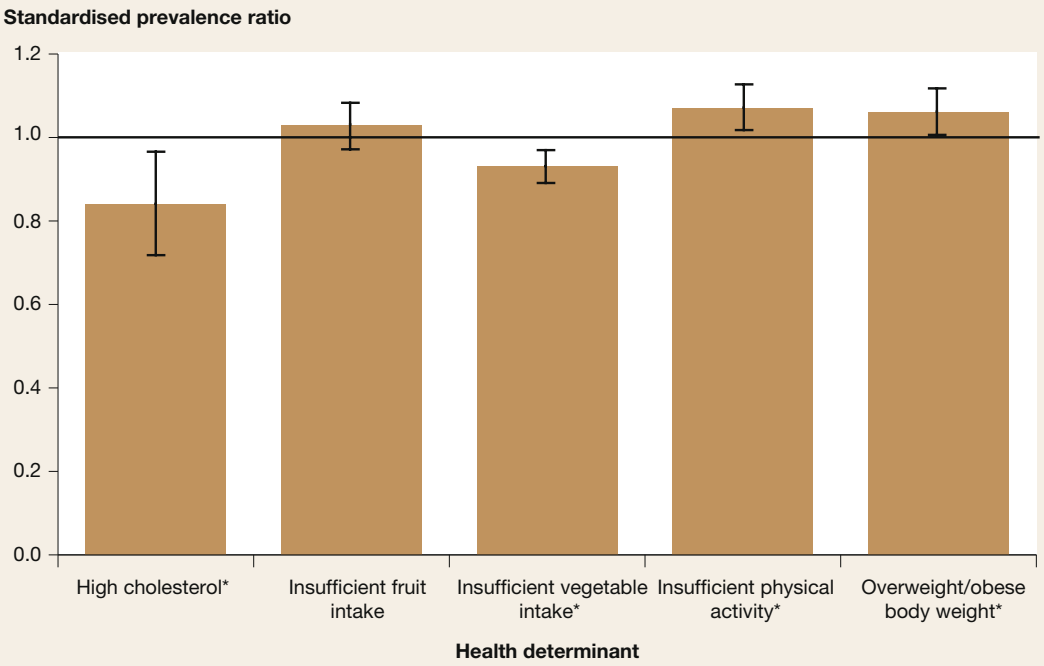
While there can be distinct health benefits gained from living away from *Major cities*, men in regional and remote areas of Australia may face additional health issues because of their location, work and lifestyle. The physical nature of many occupations in these regions is often hazardous, involving heavy machinery and chemicals, long shifts and isolation, and there is an increased risk for drivers and passengers through longer travel distances and higher speed limits (Dixon & Welch 2000; AIHW 2007).

While such environmental factors are important considerations when comparing the health of urban and rural men, behavioural factors also play a role. Risk-taking behaviour among rural men may be evident in drug and alcohol use, driving, safety procedures and attitudes towards health. An attitude of self-reliance and reluctance to seek help combined with fewer opportunities to access preventive health care and public health education contribute to the poorer health of rural men documented in previous studies (AIHW: Strong et al. 1998; Begg et al. 2007; AIHW 2008c).

Health determinants

Poor eating habits, low levels of physical activity and being overweight or obese are linked to a range of intermediate and long-term health problems (AIHW 2008a). Compared with their counterparts in *Major cities*, men living in *Other* areas were significantly more likely to eat the recommended 5 or more daily servings of vegetables (Figure 4). As for fruit intake, there was no significant difference between *Major cities* and *Other* areas, although detailed analysis shows that men in *Outer regional* and *Remote* areas were significantly less likely than men in *Major cities* to eat the recommended daily servings of fruit (Appendix Table B1). Overall, men living outside of *Major cities* were 6% more likely to be overweight or obese (based on self-reported height and weight) and 7% more likely to undertake a level of physical activity that was insufficient to provide a health benefit.

Rates of high blood cholesterol were 16% lower among men aged 25 years or over in *Other* areas, compared with rates for male residents of *Major cities*. However, it is important to consider that knowledge of blood cholesterol concentration requires a test to be performed, and men outside of *Major cities* with lower levels of access to health services may be unaware of their cholesterol status.



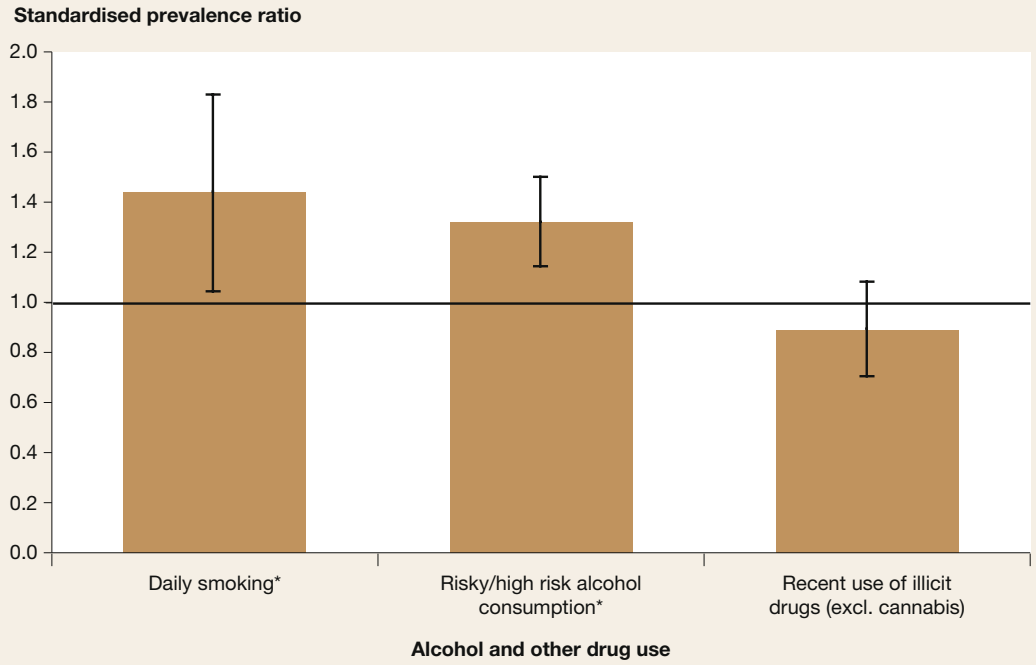
Notes

1. The horizontal line represents the standard rate of men living *Major cities*.
2. * indicates a statistically significant difference from men in ($p<0.05$).

Source: Appendix Table B1.

Figure 4: Standardised prevalence ratios for men outside of *Major cities* (compared with men within *Major cities*), selected health determinants, 2004–05

Compared with men in *Major cities*, men in *Other* areas were significantly more likely to report daily smoking and consumption of alcohol in quantities that risked harm in the long term (Figure 5). In 2007, the likelihood of these behaviours increased with levels of remoteness. Men in *Outer regional* areas were 1.5 times as likely to be a daily smoker and 1.4 times as likely to report risky/high risk alcohol consumption. Men in *Remote* and *Very remote* areas were 1.7 times as likely to be a daily smoker and 1.5 times as likely to report risky/high risk alcohol consumption.



Notes

1. The horizontal line represents the standard rate of men living in *Major cities*.
2. * indicates a statistically significant difference from men in *Major cities* (p<0.05).

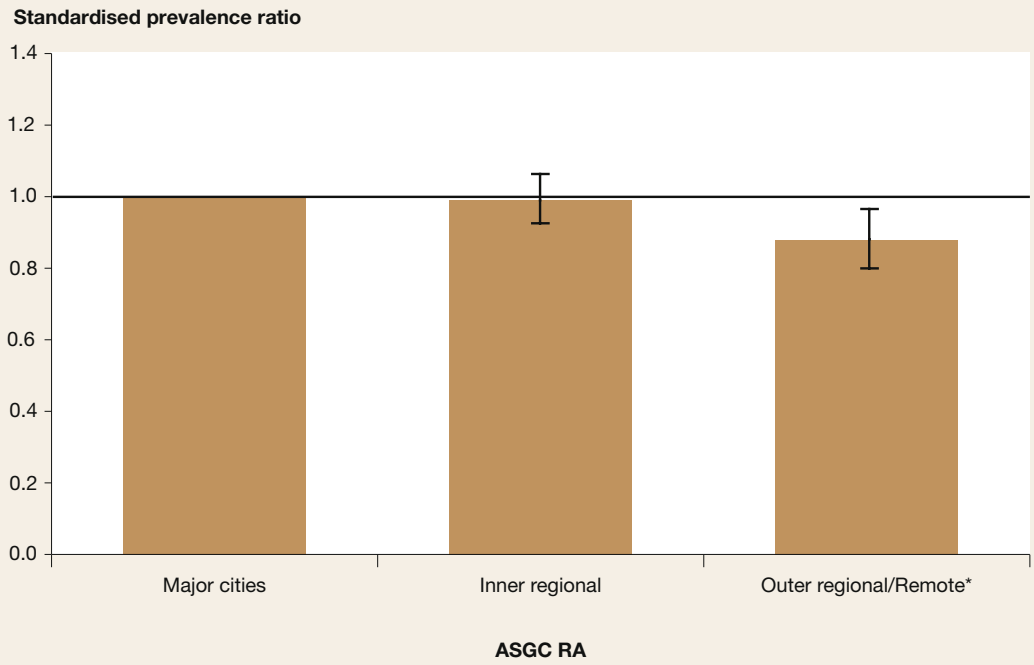
Source: Appendix Table B2.

Figure 5: Standardised prevalence ratios for men outside of *Major cities* (compared with men within *Major cities*), alcohol and other drug use, 2007

Health literacy—the ability to understand health information and use that information to make good decisions about personal health and medical care—has been recognised as a social determinant of health. There is evidence that lower levels of health literacy are associated with poorer health status (Schwartzberg, Van Geest & Wang 2005). In 2006, men living in *Inner regional* and *Outer regional/ Remote* areas were up to 22% less likely than men in *Major cities* to possess an adequate level of health literacy (Appendix Table B3). The most recent national Australian survey of mental health literacy (2003–04) found similar levels of literacy across Remoteness Areas, however separate analysis by sex was not conducted (Griffiths, Christensen & Jorm 2009).

Self-assessed health status

The 2004–05 ABS NHS asked respondents over 15 years of age to assess their health against five grades, from excellent through to poor. Compared with their counterparts in *Major cities*, men living in *Outer regional* and *Remote* areas were 12% less likely to report having very good or excellent health (Figure 6). However, self-assessed health status was generally similar between men living in *Inner regional* areas and *Major cities*.



Notes

1. The horizontal line represents the standard rate of men living in *Major cities*.
2. * indicates a statistically significant difference from men in *Major cities* (p<0.05).
3. *'Remote'* does not include areas classified as *Very remote*.

Source: AIHW analysis of the ABS 2004–05 NHS.

Figure 6: Standardised prevalence ratio for very good/excellent self-assessed health status by ASGC RA, men, 2004–05

Health conditions

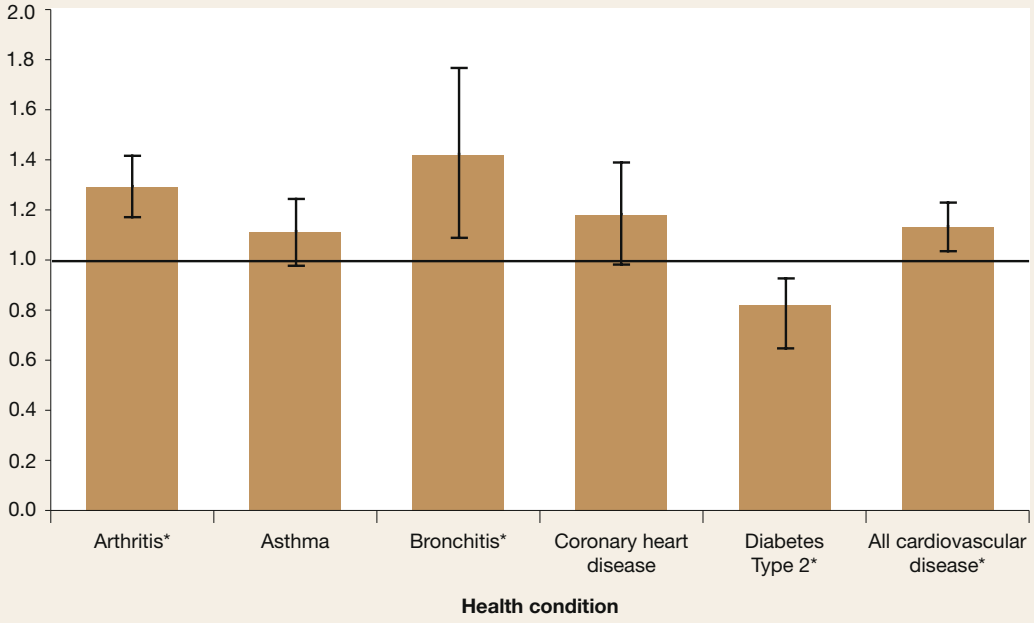
In general, men living outside of *Major cities* had a higher prevalence of chronic disease (Figure 7). Compared with men in *Major cities*, men living in *Other* areas were significantly more likely to report arthritis, bronchitis, COPD, heart attack and cardiovascular disease. However, the prevalence of self-reported Type 2 diabetes was significantly lower.

Moreover, men living in *Other* areas were 18% more likely than their *Major cities* counterparts to report an injury in the four weeks prior to the survey, and a long-term condition resulting from an injury (Appendix Table B4).

Cancer

In 2003–05, the incidence of all cancer for men outside of *Major cities* was 5% lower than their counterparts in *Major cities* (Table 2). Men outside of *Major cities* had a significantly lower incidence rate for prostate, lymphoma, stomach, kidney, lung and colorectal cancer, but had a significantly higher incidence of a number of preventable cancers, for example those associated with smoking (lip, head and neck cancers). Incidence of cancers of an unknown site was also higher.

However, further away from *Major cities* the pattern changes somewhat. Men in *Remote* and *Very remote* areas had significantly lower incidence rates than their *Major cities* counterparts for lymphoma (up to 46% lower), prostate cancer (up to 36% lower) and melanoma (up to 36% lower) but much higher rates of lip cancer (up to 132% higher) and head and neck cancer (up to 137% higher).



Notes

1. The horizontal line represents the standard rate of men in *Major cities*.
2. * indicates a statistically significant difference from men in *Major cities* (p<0.05).

Source: Appendix Table B4.

Figure 7: Standardised prevalence ratios for men outside of *Major cities* (compared with men within *Major cities*), selected health conditions, 2004–05

Table 2: New cases of cancer, by cancer site and ASGC RA, men, 2003–05

Cancer type	*Major cities*	*Inner regional*	*Outer regional*	*Remote*	*Very remote*	Outside *Major cities*
			Rate ratio			
Prostate	1.00	0.97*	0.92*	0.84*	0.64*	0.76*
Colorectal	1.00	0.99	0.93*	1.00	0.65*	0.97*
Melanoma	1.00	1.07*	0.97	0.83*	0.64*	1.02
Lung	1.00	0.93*	0.95*	1.08	1.10	0.95*
Lymphoma	1.00	0.85*	0.71*	0.55*	0.54*	0.79*
Bladder	1.00	0.95	0.97	0.88	1.19	0.96
Unknown site	1.00	1.04	1.05	1.09	1.91*	1.05*
Leukaemia	1.00	0.99	0.92	0.96	0.65*	0.96
Stomach	1.00	0.84*	0.79*	0.72*	0.62*	0.82*
Kidney	1.00	0.92	0.89*	0.94	0.63*	0.91*
Lip	1.00	1.53*	1.72*	2.32*	1.58	1.63*
Head and neck	1.00	0.97	1.18*	1.24*	2.37*	1.08*
All cancers	**1.00**	**0.96***	**0.92***	**0.90***	**0.83***	**0.95***

* Significantly different from Major cities (p<0.05).

Note: Data are based on the 10 most common cancers in Australia, plus Lip and Head and neck.

Source: AIHW analysis of National Cancer Statistics Clearing House.

Mental disorders

In 2007, men living outside *Major cities* were 28% more likely than those living within to have a substance use disorder at some point in their life (lifetime disorder). While it appears that the prevalence of any lifetime disorder was higher for men living in *Inner regional*, *Outer regional* and *Remote* areas than in *Major cities*, it is not possible to draw any definitive statistical findings due to limitations in the size of the survey.

Table 3: Lifetime mental disorders by ASGC RA, men, 2007

Lifetime mental disorders[a]	*Major cities*	*Inner regional*	*Outer regional/Remote*	Outside *Major cities*
			Rate ratio	
Anxiety	1.00	0.86	0.78	0.83
Affective	1.00	0.92	1.17	1.00
Substance use disorder	1.00	1.25	1.33	1.28*
Any lifetime mental disorder[b]	**1.00**	**1.09**	**1.11**	**1.09**

* Significantly different from *Major cities* ($p<0.05$).

(a) Persons who met criteria for diagnosis of a lifetime mental disorder (with hierarchy). See Appendix A for further explanation.

(b) A person may have more than one lifetime disorder.

Source: AIHW analysis of 2007 ABS National Survey of Mental Health and Wellbeing.

Changes in health status over time

Table 4 summarises the direction of change across a selection of health status indicators between 1995 and 2004–05 to provide an indication of whether the health status of men is improving. In general, changes in health status were similar inside and outside of *Major cities*; however, the direction of change was not necessarily always favourable. Interestingly, the rate of men reporting very good or excellent health increased in *Major cities* and decreased in areas outside of them.

In interpreting these changes it is important to understand that improvements in health status across geographic regions do not necessarily result in improvements of any existing inequality gap between *Major cities* and other geographical regions (see AIHW 2008c).

Table 4: Summary of changes in male health status between 1995 and 2004–05, inside and outside *Major cities*

Health status	Trend in *Major cities*	Trend outside *Major cities*
Diabetes, osteoporosis	↑	↑
Asthma	↓	↓
Bronchitis	↔	↓
Short-term injury[(a)]	↑	↑
Long-term condition due to injury[(a)]	↓	↓
Arthritis	↔	↔
Self-assessed health status—very good/excellent health	↑	↔

(a) Injury analysis between 2001 and 2004–05.

Note: Data are self-reported in the ABS National Health Survey.

Source: Appendix Table B5.

5 Men in the general practice setting

The Australian health system provides a wide range of preventive and health care services. For the majority of people, the general practitioner (GP) is the first point of contact to discuss a health issue. Information on the users of general practice services, for example on the reasons for their visit and their medical problems, can supplement health data collected through population surveys and administrative by-product data.

The following section provides details on general practice patients that have been reported by GPs through the Bettering the Evaluation and Care of Health (BEACH) survey. BEACH is a national continuous survey of general practice activity in Australia (see Appendix A for further information). The survey is a particularly rich source of health information because it includes the medical problems managed; information that is unavailable through Medicare records or Australia's National Health Survey.

However, BEACH can only provide information on clients who have access to, and seek, general practice services, and there is evidence that men are less likely than women to utilise health services (Bayram, Britt , Kelly & Valenti 2003). Aboriginal and Torres Strait Islander people are also under-identified in the survey; around 1% of encounters involve people identifying as Indigenous (Britt et. al 2008), yet Indigenous Australians comprise just over 2% of the Australian population. Recent work found Indigenous identification in the survey is underestimated by about 10%, suggesting that barriers still exist in regards to GPs routinely asking patients about their Indigenous status (Deeble, Shelton & Goss 2008).

In the BEACH survey, any interaction between the GP and patient is called an encounter. In 2007–08, 98.6% of encounters were face-to-face consultations. Analysis by remoteness in this section is based on the address of the patient, not the address of the general practice.

In more remote areas, residents may also access hospital outpatient services for their primary care needs. These services are outside the scope of this report.

General practice data

In 2007–08, men accounted for under half (43%) of all encounters and this pattern was consistent across all geographic areas (Table 5). Compared with *Major cities*, men accounted for a larger proportion of encounters in *Outer regional* areas. Not surprisingly, the proportion of encounters with Indigenous men living in *Outer regional*, *Remote* and *Very remote* areas was significantly greater compared with *Major cities*.

Encounters with men living outside *Major cities* were less likely to involve boys (aged 0–14 years) and more likely to involve older men (65 years and over), although the latter finding reflects the large proportion of *Inner regional* resident encounters involving older men.

Table 5: Characteristics of patients at encounters by ASGC RA, men, 2007–08

Patient characteristics	*Major cities* (*n* = 29,499)	*Inner regional* (*n* = 6,372)	*Outer regional* (*n* = 3,411)	*Remote/ Very remote* (*n* = 497)	Outside *Major cities* (*n* = 10,279)	Australia (*n* = 40,761)
Age group			**Per cent of encounters**			
0–14	15.1	12.3*	11.6*	12.5	12.1*	14.3
15–24	8.1	6.2*	7.8	4.7	6.6	7.8
25–64	49.7	47.6	51.0	59.4	49.3	49.7
65+	26.5	33.2*	28.5	22.5	31.1*	27.7
Total[(a)]	**42.4**	**41.7**	**46.5***	**43.3**	**42.5**	**42.9**
Indigenous status						
Indigenous	0.4	1.0	2.1*	10.4*	1.8*	0.8

* Significantly different from *Major cities* (p<0.05).

(a) Excludes missing data.

Source: AIHW analysis of BEACH data.

Why do men visit a GP?

Patients usually have one or more reasons for encounter (RFE) when visiting a GP. In the BEACH survey, GPs are asked to record at least one and up to three reasons for a patient's visit. At nearly two-thirds of male encounters, only one RFE was recorded (Table 6).

Men living outside *Major cities* appeared less likely then those living within to present with two or three reasons for their visit.

Table 6: Number of reasons for encounter by ASGC RA, men, 2007–08

Reason for encounter	*Major cities* (*n* = 29,499)	*Inner regional* (*n* = 6,372)	*Outer regional* (*n* = 3,411)	*Remote/ Very remote* (*n* = 497)	Outside *Major cities* (*n* = 10,279)	Australia[(a)] (*n* = 40,761)
			Number per 100 encounters			
One	59.8	62.3	64.8	64.7	63.2	60.7
Two	29.1	27.8	26.2	25.9	27.2	28.6
Three	11.1	9.9	9.1	9.4	9.6	10.7

(a) Includes cases for which ASGC RA data were missing.

Source: AIHW analysis of BEACH data.

Data for the patient's reasons for encounter, and many additional items in the BEACH survey, are described using an international standard data classification in primary care, the International Classification of Primary Care—version 2 (ICPC-2) (see Appendix A for more detail).

The distribution of patient RFEs by ICPC-2 chapter is presented in Table 7. On average, male patients presented with a similar number of RFE per encounter regardless of where they lived. Compared with men living in *Major cities*:

- Respiratory and digestive reasons were reported at significantly lower rates by males living outside *Major cities*.
- Men living outside *Major cities* were more likely to see a GP about skin issues.

Table 7: Rates of patient reasons for encounter across ICPC-2 chapters by ASGC RA, men, 2007–08

ICPC chapter	*Major cities* (*n* = 29,499)	*Inner regional* (*n* = 6,372)	*Outer regional* (*n* = 3,411)	*Remote/ Very remote* (*n* = 497)	Outside *Major cities* (*n* = 10,279)	Australia[(a)] (*n* = 40,761)
			Number per 100 encounters			
General and unspecified	40.0	42.3	38.9	38.5	41.0	40.3
Respiratory	23.3	15.9*	16.5*	17.4	16.1*	21.5
Skin	16.1	18.8	19.1	20.4	18.9*	16.8
Musculoskeletal	15.9	17.5	18.0	19.4	17.7	16.4
Cardiovascular	12.0	12.3	10.2	9.3	11.4	11.8
Digestive	11.0	8.1*	9.3	7.7	8.5*	10.5
Psychological	7.4	7.2	6.9	6.6	7.1	7.3
Endocrine/ metabolic and nutritional	6.6	6.9	6.7	7.1	6.9	6.7
Neurological	4.4	4.0	4.3	3.1	4.1	4.3
Ear	4.0	4.0	3.9	4.8	4.0	4.0
Male genital	2.8	2.9	3.0	2.9	3.0	2.9
Eye	2.9	2.3	3.3	3.1	2.7	2.8
Urological	2.1	2.1	1.9	1.8	2.0	2.1
Blood, blood forming organs and immune mechanism	1.6	2.1	1.7	1.7	1.9	1.7
Social problems	1.0	1.3	0.6	1.1	1.0	1.0
Total RFEs (*n* = 61,114)	**151.3**	**147.6**	**144.3**	**144.8**	**146.4**	**149.9**

* Significantly different from *Major cities* (p<0.05).

(a) Includes missing data on ASGC RA.

Notes

1. Numbers do not total 100 as more than one RFE can be recorded at each encounter.
2. ICPC chapter is based on body systems with additional chapters for psychological and social problems (see Appendix A and Table A1 for further information).

Source: AIHW analysis of BEACH data.

What health problems do GPs manage for men?

For each encounter, GPs record the problem(s) they managed. This record is based on GP assessment and ongoing management and does not necessarily correspond with the patient's reason for encounter. GPs can record up to four problems managed at each patient encounter.

Compared with the management rate for encounters with men living in *Major cities*, the management rate of:

- new problems was significantly lower for encounters with *Inner regional* men (51.5 new problems per 100 encounters compared with 58.2) and *Remote* and *Very remote* men (44.3).
- work-related and chronic problems were significantly higher for encounters with men living outside *Major cities*.

This pattern is likely to reflect the different age profiles of the two regions.

Table 8: Type of problems[a] managed by ASGC RA, men, 2007–08

Type of problem	*Major cities* (*n* = 29,499)	*Inner regional* (*n* = 6,372)	*Outer regional* (*n* = 3,411)	*Remote/ Very remote* (*n* = 497)	Outside *Major cities* (*n* = 10,279)	Australia[b] (*n* = 40,761)
			Number per 100 encounters			
New	58.2	51.5*	53.8	44.3*	51.9*	56.4
Work-related	3.7	4.5	5.8*	8.6	5.2*	4.0
Chronic	53.3	62.2*	56.7	53.4	60.0*	55.0

* Significantly different from *Major cities* (p<0.05).

(a) Assessed by GP.

(b) Includes missing data on ASGC RA.

Source: AIHW analysis of BEACH data.

On average, the number of problems managed per encounter was significantly higher for *Inner regional* men (around 1.54 problems) than for those living in *Major cities* (1.46).

Compared with encounters involving men in *Major cities*:

- The management rates of arthritis and depression were significantly higher for men living outside *Major cities*.
- The acute conditions, gastroenteritis and upper respiratory infection, were managed at significantly lower rates at encounters with men living in all areas outside *Major cities*.

Table 9: Most frequently managed problems[a] by ASGC RA, men, 2007–08

Problem managed	*Major cities* (*n* = 29,499)	*Inner regional* (*n* = 6,372)	*Outer regional* (*n* = 3,411)	*Remote/ Very remote* (*n* = 497)	Outside *Major cities* (*n* = 10,279)	Australia[b] (*n* = 40,761)
	Number per 100 encounters					
Hypertension†	10.5	11.7	10.0	8.5	11.0	10.6
Upper respiratory tract infection	7.4	3.8*	3.8*	2.7*	3.7*	6.4
Check-up–all†	4.9	5.5	6.3	9.2	6.0	5.2
Diabetes†	4.5	5.0	5.3	5.2	5.1	4.6
Lipid disorders†	4.4	4.4	4.0	3.3	4.2	4.3
Immunisation/vaccination–all†	4.3	4.7	3.3	5.9	4.3	4.3
Arthritis	2.9	4.3*	3.8	2.7	4.1*	3.2
Depression†	3.0	4.0	4.0	4.0	4.0*	3.2
Back complaint†	2.8	3.4	3.6	4.2	3.5	3.0
Acute bronchitis/ bronchiolitis	2.6	2.1	2.7	1.5	2.3	2.6
Oesophageal disease	2.3	2.5	2.9	1.3	2.6	2.4
Asthma	2.2	2.4	1.9	3.2	2.3	2.3
Gastroenteritis	2.2	1.0*	1.1*	0.5*	1.0*	1.9
Prescription–all†	1.9	1.8	2.1	1.3	1.9	1.9
Sprain/strain†	1.9	1.7	2.1	1.4	1.8	1.9
Total problems (*n* = 60,081)	**146.0**	**154.0***	**147.5**	**149.1**	**151.6**	**147.4**

* Significantly different from *Major cities* (p<0.05).

(a) Most frequently managed problems based on top 15 most frequently managed problems nation-wide.

(b) Includes missing data on ASGC RA.

† Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix Table A2).

Source: AIHW analysis of BEACH data.

How are health problems managed?

While GPs can manage health problems in a number of different ways, medication (either prescribed, GP-supplied or advised for over-the-counter) is the treatment most frequently used.

Total medications were prescribed, supplied or advised by GPs at a similar rate across geographic regions (Table 10).

However, compared with GP encounters involving men in *Major cities*:

- Antibiotics were less commonly prescribed, supplied or advised at encounters with *Inner regional* men and more often provided at encounters involving *Very remote* men.
- The rate of prescription, supply or advice of ear/nose/throat medications was lower at encounters involving men living outside *Major cities* and specifically, *Inner regional* men.

Table 10: Summary of medications prescribed, supplied or advised[a] by ASGC RA, men, 2007–08

CAPS group[b]	*Major cities* (*n* = 29,499)	*Inner regional* (*n* = 6,372)	*Outer regional* (*n* = 3,411)	*Remote/ Very remote* (*n* = 497)	Outside *Major cities* (*n* = 10,279)	Australia[c] (*n* = 40,761)
			Number per 100 encounters			
Cardiovascular	18.0	19.9	18.0	17.9	19.2	18.3
Antibiotics	15.4	11.8*	13.6	11.8	12.4*	14.6
Central nervous system	13.9	14.1	16.2	11.6	14.7	14.1
Allergy	8.2	8.7	6.7	7.2	8.0	8.1
Psychological	6.6	8.0	7.7	7.1	7.8	6.9
Musculoskeletal	5.9	6.0	7.2	7.5	6.5	6.1
Respiratory	5.8	3.9	5.1	6.4	4.4	5.4
Digestive	5.3	4.8	4.9	4.4	4.8	5.2
Hormone	5.0	5.4	7.4	4.4	6.0	5.2
Skin	5.3	4.9	5.2	2.8	4.9	5.1
Blood	2.6	3.1	3.4	2.7	3.1	2.8
Ear, nose and throat	2.5	1.7*	2.6	1.8	2.0*	2.4
Eye	1.8	1.6	2.6	2.5	2.0	1.9
Urological, genital	1.8	1.6	2.0	1.8	1.7	1.8
Nutrition	1.8	1.0	1.2	0.8	1.0	1.6
Miscellaneous	0.8	0.6	1.2	1.1	0.9	0.8
Anti-neoplastic	0.5	0.7	0.5	0.5	0.6	0.6
Surgical procedures	0.2	0.3	0.2	0.0	0.3	0.2
Diagnostic agents	0.1	0.0	0.1	0.0	0.1	0.1
Contraceptives	0.0	0.0	0.0	0.0	0.0	0.0
Total (*n* = 41,305)	**101.6**	**98.2**	**105.9**	**92.1**	**100.4**	**101.3**

* Significantly different from *Major cities* ($p<0.05$).

(a) Includes medications prescribed, supplied or advised (over-the-counter) by the GP.

(b) CAPS (Coding Atlas for Pharmaceutical Substances) is a classification system developed by the Family Medicine Research Centre. For more information please refer to Family Medicine Research Centre 2009.

(c) Includes missing data on ASGC RA.

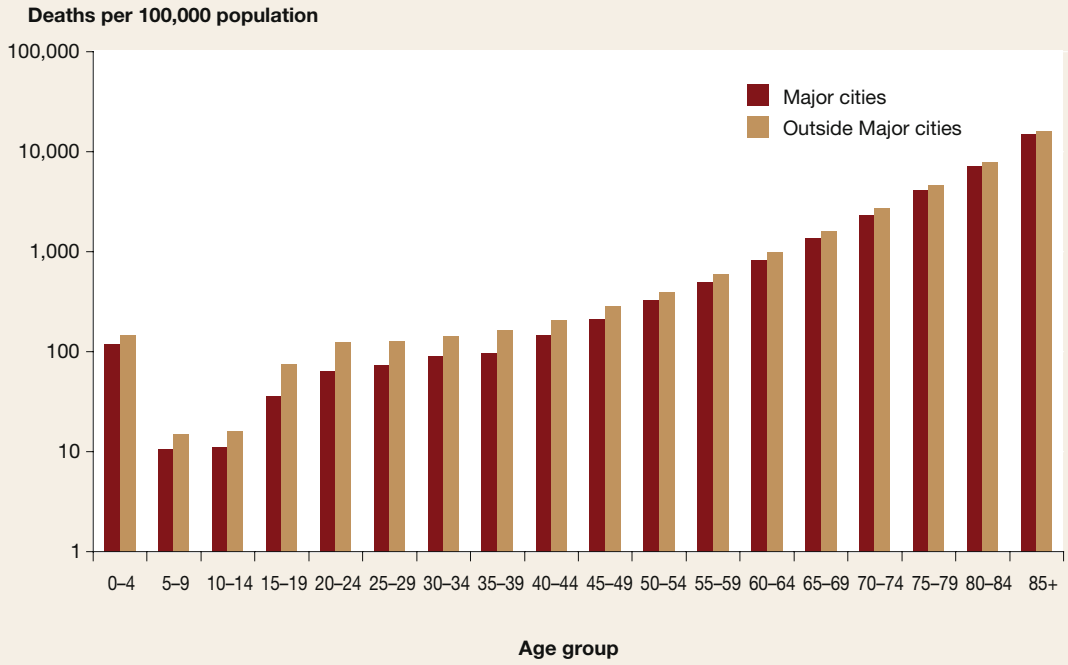
Source: AIHW analysis of BEACH data.

6 Mortality

Analysis of mortality data provides an important insight into men's health. As causes of death are influenced by risk factors and lifestyle, they can provide a broader indication of the general health of men living in different areas. Almost all deaths are registered, therefore information provided from death records is usually comprehensive.

This section provides an overview of regional differences in mortality. It includes statistics for selected causes of death, life expectancy and mortality by marital status. While most of the data are for the years 2004 to 2006, some of the data are presented for 2006 only.

During the period 2004–06, the age-adjusted mortality rate for men outside *Major cities* was 791.1 per 100,000 population compared with 524.7 women. In total, there were about 204,000 male deaths in Australia. Around 61% of these were for men who lived in *Major cities*, while 39% were men who lived in *Other* areas (*Inner regional*, *Outer regional*, *Remote* and *Very remote*). Males in *Other* areas had a similar overall age pattern of mortality when compared with those in *Major cities*, but had higher death rates across all age groups (Figure 8). This is partly due to the greater proportion of Indigenous people living in these areas (Table 1).



Note: Logarithmic scale on the y axis.

Source: AIHW National Mortality Database.

Figure 8: Age-specific death rates by region, men, 2004–06

The proportion of male deaths in each age group varied across regions (Appendix Table B6). For example, 57% of deaths in Major cities were among those aged over 75, while the corresponding figure in Very remote areas was 23%. These findings reflect the generally younger age profile in more remote areas (Figure 1).

What are rural men dying from?

Coronary heart disease was the most common underlying cause of death both inside and outside *Major cities* (Table 11). However, deaths due to land transport accidents, COPD, prostate cancer, suicide and diseases of the liver were all more common outside *Major cities*. Cerebrovascular disease, influenza, dementia, pancreatic cancer and renal failure were more common causes of death in *Major cities*.

Table 11: Leading underlying causes of death by ASGC RA, men, 2004–06

Major cities			Outside *Major cities*		
Cause of death	Deaths	Proportion of all deaths (per cent)	Cause of death	Deaths	Proportion of all deaths (per cent)
Coronary heart disease	23,035	18.5	Coronary heart disease	14,515	18.5
Cerebrovascular disease	8,875	7.1	Lung cancer	5,429	6.9
Lung cancer	8,640	6.9	Cerebrovascular disease	5,046	6.4
Prostate cancer	5,220	4.2	COPD	3,682	4.7
COPD	4,824	3.9	Prostate cancer	3,427	4.4
Other heart disease	4,719	3.8	Other heart disease	3,384	4.3
Colorectal cancer	4,144	3.3	Colorectal cancer	2,543	3.2
Unknown primary site cancers	3,249	2.6	Unknown primary site cancers	2,308	2.9
Diabetes	3,222	2.6	Diabetes	2,234	2.8
Suicide	2,797	2.2	Suicide	1,881	2.4
Influenza and pneumonia	2,644	2.1	Land transport accidents	1,764	2.2
Diseases of arteries, arterioles and capillaries	2,195	1.8	Diseases of arteries, arterioles and capillaries	1,457	1.9
Dementia and related disorders	2,075	1.7	Influenza and pneumonia	1,397	1.8
Pancreatic cancer	1,950	1.6	Dementia and related disorders	1,170	1.5
Renal failure	1,853	1.5	Diseases of liver	1,156	1.5

Source: AIHW National Mortality Database.

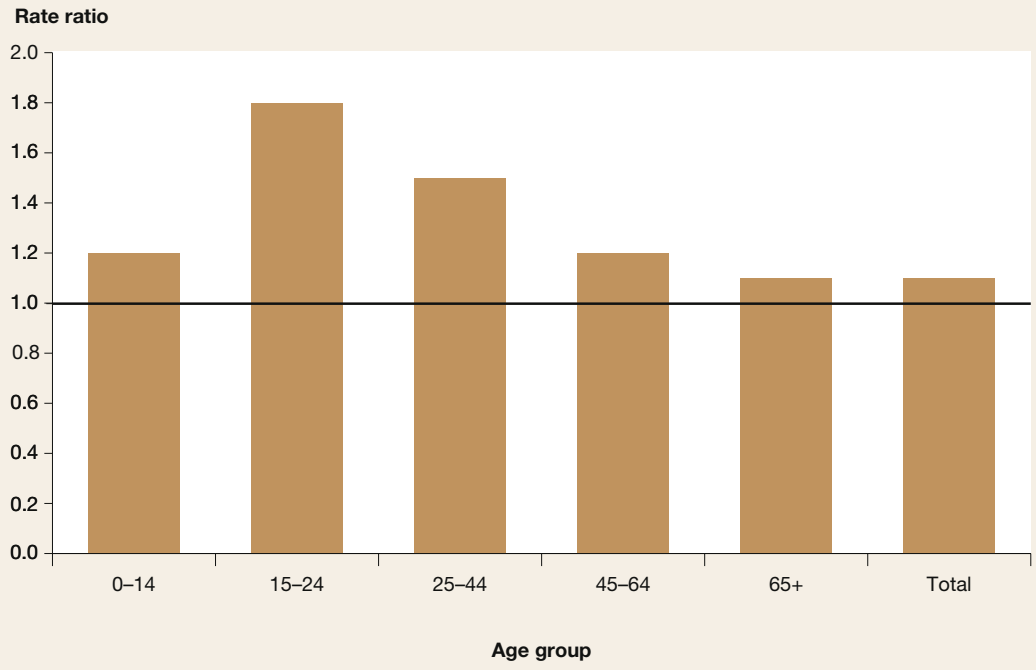
How much higher are rural death rates?

Overall, male death rates increase with remoteness (Appendix Table B7). For example, in *Inner regional* areas death rates were 8% higher than *Major cities* and in *Very remote* areas, 78% higher. The pattern of higher mortality with increasing remoteness was generally consistent across all age groups (Figure 9). Death rates among younger men were notably higher outside *Major cities* than within them. For example, death rates among men aged 15–24 years were around 80% higher. Much of this difference is due to high Indigenous death rates among young adults.

In contrast, death rates for older men (aged 65 years and over) living outside *Major cities* were only slightly higher than those for their *Major cities* counterparts.

For most causes of death, mortality rates were higher outside *Major cities* than within them (Table 12). Exceptions to this include infectious diseases, cerebrovascular diseases and deaths due to falls. For nearly all causes of death, death rates increased with remoteness.

The causes associated with elevated death rates outside *Major cities* included injury and poisoning (referred to as injury), musculoskeletal diseases (such as osteoporosis), COPD, oral cancer and diabetes. Many types of injury were associated with higher death rates outside *Major cities*. For example, motor vehicle accident (MVA) mortality (114% higher outside *Major cities* than within them), other land transport (90% higher), assault (31% higher), suicide (33% higher) and other external causes (38% higher).



Note: The horizontal line represents the standard rate of men living in *Major cities*.

Source: AIHW National Mortality Database.

Figure 9: Age-specific mortality ratios for all causes, outside *Major cities* compared with *Major cities*, men, 2004–06

Table 12: Selected causes of death by ASGC RA, men, 2004–06

Cause of death	*Major cites*	Outside *Major cities*	*Major cities*	*Inner regional*	*Outer regional*	*Remote*	*Very remote*	Outside *Major cities*
	No. per 100,000		Standardised mortality ratio					
All causes	623	757	1.00	1.08*	1.14*	1.25*	1.78*	1.11*
Infectious diseases	10	9	1.00	0.80*	0.89	1.28	2.00*	0.87*
Neoplasms	204	244	1.00	1.06*	1.09*	1.03	1.14*	1.07*
Colorectal	21	25	1.00	1.06*	1.10*	0.87	0.63*	1.06*
Lung	43	52	1.00	1.06*	1.09*	1.12	1.34*	1.07*
Melanoma	8	9	1.00	1.11*	1.07	0.74	0.55	1.07*
Oral cavity	4	5	1.00	1.07	1.45*	1.49	4.90*	1.27*
Prostate	26	33	1.00	1.14*	1.18*	1.02	0.96	1.14*
Diabetes	16	22	1.00	1.05	1.33*	1.97*	3.65*	1.21*
Nervous system disorders	20	23	1.00	1.06*	1.02	0.87	1.66*	1.05*
Circulatory diseases	203	246	1.00	1.08*	1.13*	1.22*	1.68*	1.11*
Coronary heart disease	115	140	1.00	1.08*	1.13*	1.18*	1.62*	1.11*
Cerebrovascular	44	49	1.00	1.02	0.96	1.03	1.34*	1.01
Other circulatory diseases	43	58	1.00	1.16*	1.28*	1.52*	2.14*	1.22*
Respiratory diseases	54	64	1.00	1.03	1.15*	1.31*	2.23*	1.09*
COPD	24	36	1.00	1.24*	1.45*	1.58*	2.67*	1.33*
Digestive	21	26	1.00	1.07*	1.18*	1.57*	1.95*	1.14*
Musculoskeletal	3	4	1.00	1.36*	1.24*	2.05*	2.43*	1.36*
Injury and poisoning	45	64	1.00	1.30*	1.53*	1.93*	3.14*	1.44*
Assault	1	1	1.00	1.04	1.15	3.05*	5.52*	1.31*
Falls	5	5	1.00	0.92	0.86	1.19	0.79	0.91*
MVA	7	15	1.00	1.90*	2.26*	2.85*	4.78*	2.14*
Other land transport	1	2	1.00	1.60*	2.09*	2.27*	6.33*	1.90*
Suicide	14	18	1.00	1.18*	1.43*	1.78*	2.89*	1.33*
All other injuries/ poisoning	17	23	1.00	1.25*	1.49*	1.73*	2.65*	1.38*

* Significantly different from *Major cities* (p<0.05).

Source: AIHW National Mortality Database.

The higher proportion of Indigenous men in more remote areas, and their higher death rates compared with non-Indigenous men, has a strong influence on mortality statistics in *Remote* and *Very remote* areas (ABS & AIHW 2008). Table 13 controls for this influence by analysing mortality by remoteness for non-Indigenous males only.

For non-Indigenous men, *Remote* and *Very remote* death rates were between 10–12% higher than *Major cities*, indicating that higher mortality in more remote areas is not due exclusively to the higher proportion of Indigenous men living there. Death rates were particularly higher outside *Major cities* for injury, oral cancer, COPD and diabetes; this is a similar pattern as observed for all men regardless of Indigenous status.

Table 13: Selected causes of death by ASGC RA, non-Indigenous men, 2004–06

Cause of death	*Major cities*	Outside *Major cities*	*Major cities*	*Inner regional*	*Outer regional*	*Remote*	*Very remote*	Outside *Major cities*
	No. per 100,000		Standardised mortality ratio					
All causes	582	732	1.00	1.18*	1.20*	1.09*	1.12*	1.18*
Infectious diseases	8	9	1.00	1.01	1.08	0.92	1.38	1.04
Neoplasms	194	243	1.00	1.19*	1.16*	1.04	1.04	1.17*
Colorectal	19	23	1.00	1.12*	1.21*	0.87	0.63*	1.12*
Lung	42	54	1.00	1.17*	1.25*	1.12	1.26	1.20*
Melanoma	8	9	1.00	1.19*	1.08	0.76	0.71	1.11
Oral cavity	4	6	1.00	1.30*	1.75*	1.44	3.62*	1.55*
Prostate	25	32	1.00	1.25*	1.18*	1.02	1.08	1.20*
Diabetes	14	20	1.00	1.21*	1.43*	1.66*	1.46	1.33*
Nervous system disorders	18	20	1.00	1.10*	0.98	0.75*	0.52*	1.02
Circulatory diseases	191	236	1.00	1.17*	1.15*	1.06	1.08	1.15*
Coronary heart disease	111	138	1.00	1.18*	1.17*	1.02	0.99	1.16*
Cerebrovascular	41	47	1.00	1.15*	0.97	0.89	1.01	1.06*
Other circulatory diseases	39	52	1.00	1.16*	1.28*	1.33*	1.41*	1.22*
Respiratory diseases	50	61	1.00	1.09	1.15*	1.01	1.12	1.11*
COPD	22	34	1.00	1.36*	1.54*	1.45*	1.82*	1.45*
Digestive	19	23	1.00	1.09	1.26*	1.00	0.97	1.14*
Musculoskeletal	2	3	1.00	1.07	1.11	1.14	1.61	1.10
Injury and poisoning	42	66	1.00	1.50*	1.68*	1.60*	1.85*	1.59*
Assault	1	1	1.00	2.29*	1.64	1.03	3.51	1.96*
Falls	4	5	1.00	1.29*	1.18	1.27	0.60	1.23*
MVA	8	17	1.00	2.27*	2.33*	2.66*	3.11*	2.36*
Other land transport	1	2	1.00	2.10*	2.22*	2.37*	5.71*	2.30*
Suicide	13	20	1.00	1.46*	1.59*	1.43*	1.25	1.50*
All other injuries/ poisoning	16	21	1.00	1.19*	1.54*	1.28*	1.70*	1.35*

* Significantly different from Major cities ($p<0.05$).

Notes

1. Experimental estimates of the Indigenous population in 2006 have been used to approximate the non-Indigenous population at risk. As mortality data for 2004–06 is coded on 2001 ASGC RA and non-Indigenous population estimates are based on 2006 ASGC RA, this analysis should be interpreted with caution (see Appendix B for more information).
2. Data are for Queensland, Western Australia, South Australia and the Northern Territory only.

Source: AIHW National Mortality Database.

How has rural mortality changed over time?

Male mortality outside *Major cities* has improved marginally between the periods 2002–04 and 2004–06 (Appendix table B8). In 2004–06, mortality in *Inner regional* and *Outer regional* areas was slightly lower compared with 2002–04, while in *Remote* and *Very remote* areas there was no significant change.

What health problems contribute to higher rural death rates?

Although rate ratios can illustrate how much higher mortality is in one area than another, they cannot describe which causes of death are responsible for the elevated mortality rates in rural areas. Table 14 presents this information using the concept of 'excess death'—the number of additional deaths in rural areas over and above the number expected if death rates in *Other* areas were the same as *Major cities*.

Circulatory diseases represented nearly a third of all excess death outside *Major cities*, followed closely by injury (26%) and neoplasms (21%). Many of these causes are potentially preventable, such as MVA (10%) and suicide (6%).

Table 14: Proportion[(a)] of excess death by ASGC RA, men, 2004–06

Cause	*Inner regional*	*Outer regional*	*Remote*	*Very remote*	Outside *Major cities*
Infectious diseases	–3.9	–1.2	1.7	2.1	–1.8
Neoplasms	27.8	20.5	4.0	5.8	20.8
Colorectal	2.5	2.4	– 1.8	–1.6	1.7
Lung	5.2	4.8	3.6	3.1	4.7
Melanoma	1.7	0.6	–1.3	–0.8	0.8
Oral cavity	0.6	2.1	1.3	3.5	1.5
Prostate	7.8	5.4	0.3	–0.2	5.4
Diabetes	1.7	6.2	9.8	8.3	4.8
Nervous system disorder	2.3	0.4	–1.6	2.7	1.3
Circulatory diseases	35.7	29.6	26.8	25.8	31.7
Coronary heart disease	19.3	17.7	12.6	13.8	17.6
Cerebrovascular	1.9	–2.1	0.7	2.6	0.4
Other circulatory diseases	14.6	13.9	13.6	9.3	13.7
Respiratory diseases	3.4	8.9	9.7	11.8	6.8
COPD	12.3	12.4	8.3	7.1	11.5
Digestive	3.2	4.4	7.9	4.3	4.1
Musculoskeletal	2.1	0.7	1.7	0.7	1.4
Injury and poisoning	24.3	25.2	29.9	27.9	25.5
Assault	0.1	0.2	1.5	1.5	0.4
Falls	–0.8	–0.7	0.6	–0.2	–0.6
MVA	11.7	9.5	10.0	8.9	10.4
Other land transport	1.1	1.2	1.0	1.7	1.2
Suicide	4.5	6.4	8.2	8.2	5.9
All other injuries/poisoning	7.8	8.7	8.7	7.8	8.2

(a) Per cent of a region's total excess death attributable to a specific cause of death.

Source: AIHW National Mortality Database.

The proportion of excess deaths among non-Indigenous males outside *Major cities* was mostly similar to all males (Appendix Table B9). Exceptions included neoplasms, which accounted for 21% of excess death among all males and 31% of excess death among non-Indigenous males, and other circulatory diseases (14% and 9% respectively).

Life expectancy

Life expectancy at birth represents the number of years a child born in a certain year can expect to live if current age-specific death rates continue over his or her lifetime.

In both 2002–2004 and 2004–2006, male life expectancy decreased with remoteness; for 2004–2006, the gap in life expectancy between *Major cities* and *Very remote* men was 7.7 years (79.8 years compared with 72.1 respectively) (Table 15). However, in 2006 this pattern was less pronounced for non-Indigenous Australians; with the gap in life expectancy between those born in *Major cities* and *Very remote* regions just over 3 years (80.8 years compared to 77.7).

The likelihood of a newborn boy living to 65 years also decreased with remoteness. For example, if current death rates remained, 88% of boys born in *Major cities* are expected to reach the age of 65, while the corresponding figure for boys in *Very remote* areas is 72%—again reflecting the high proportion of Indigenous men in *Very remote* areas.

Table 15: Male life expectancy at birth by ASGC RA, 2002–04, 2004–06 and 2006

Period/measure	*Major cities*	*Inner regional*	*Outer regional*	*Remote*	*Very remote*	Outside *Major cities*
2002–04						
Life expectancy (years)	79.0	77.8	76.9	76.5	72.1	77.2
2004–06						
Life expectancy (years)	79.8	78.6	77.7	76.6	72.1	77.8
Probability of living to age 65 (%)	88.1	86.4	84.7	81.9	72.3	84.9
2006 estimate						
Non-Indigenous males[(a)]	80.8	77.6	77.6	78.7	77.7	77.7
(95% CI)	(80.6 – 81.0)	(77.3 – 78.0)	(77.2 – 78.0)	(77.9 – 79.6)	(76.2 – 79.2)	(77.4 – 77.9)

(a) Based on experimental estimates of the non-Indigenous population in Qld, WA, SA and NT only.

Sources: AIHW 2008b; AIHW National Mortality Database.

Marriage and mortality

Numerous studies show that unmarried people are at a higher risk of poor health and death than their married counterparts (Johnson et al. 2000; Lindstrom 2009). Likewise, studies suggest that, among men, those of lower socioeconomic status are less likely to get married (while the opposite may be true of women) (Xie et al. 2003; Franklin and Tueno 2004). Hence, unmarried men outside *Major cities* may be viewed as facing an additional disadvantage in terms of mortality.

These relationships are reflected in Table 16, which shows that for all causes of death, never married men in all areas have higher death rates than married men in *Major cities*. In general, this pattern increases with remoteness.

Ratios for suicide mortality are particularly high, with never married men in *Remote* and *Very remote* areas having suicide rates ten times as high as married men living in *Major cities*.

Table 16: Standardised mortality ratios of never married men compared with married men[(a)] in *Major cities*, selected causes of death by ASGC RA, 2006

Cause	*Major cities*	*Inner regional*	*Outer regional*	*Remote/ Very remote*
All causes	1.99*	2.51*	2.51*	3.09*
Neoplasms	1.26*	1.59*	1.47*	1.29
Diabetes	2.26*	2.00*	3.14*	4.52*
Circulatory diseases	1.96*	2.36*	2.26*	2.97*
Respiratory diseases	2.21*	2.31*	2.81*	4.03*
COPD	2.10*	2.36*	3.04*	3.33*
Injury and poisoning (excl. suicide)	2.50*	4.48*	4.91*	6.65*
Suicide	4.79*	6.31*	6.84*	10.01*

* Significantly different from married men in *Major cities* ($p<0.05$).

(a) Registered marital status only. Excludes de facto and tribal marriage.

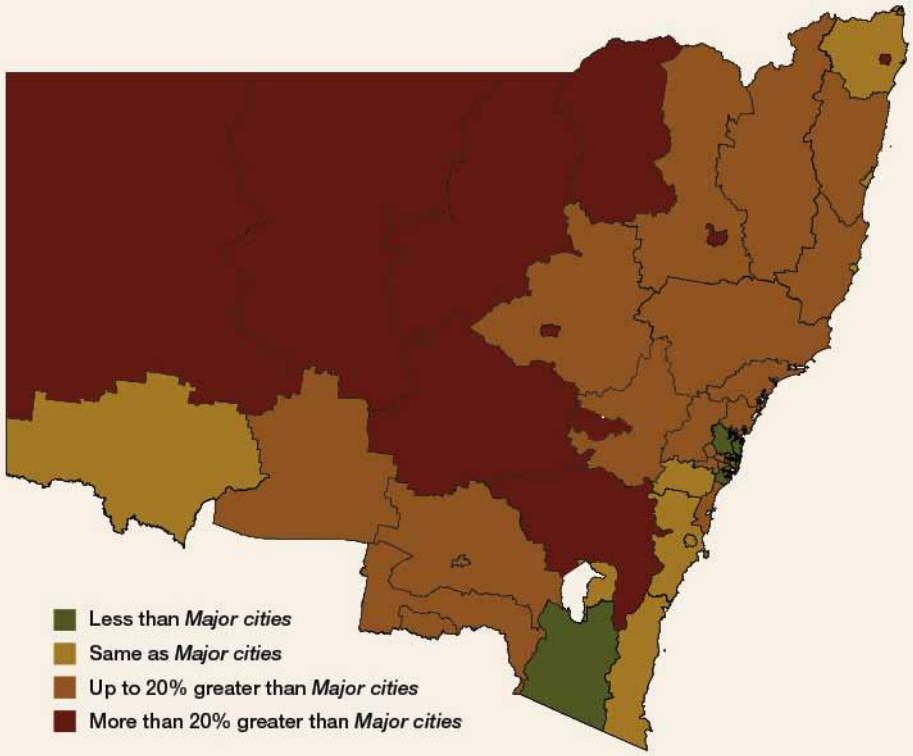
Source: AIHW National Mortality Database.

Mortality across states/territories

While analysis at a national level (using the ASGC RA) provides a useful overview of the relationship of mortality and remoteness, it can mask variation in health status within the broad categories. Therefore, analysis by smaller geographic areas may be useful accompanying information.

Analysis in this section considers whether there is a consistent relationship between mortality and remoteness across states/territories. The seven maps in this section display mortality by SSD for each jurisdiction (excluding the ACT) in 2004–06. In each map, death rates are compared with the rate for all *Major cities* in Australia, not just the *Major cities* in that jurisdiction.

In general, mortality was comparatively low in *Major cities* and increased with remoteness. This relationship was seen in New South Wales, Western Australia and South Australia, while, perhaps due to their smaller size, it was less clear in Victoria and Tasmania. Mortality was very high throughout the Northern Territory.



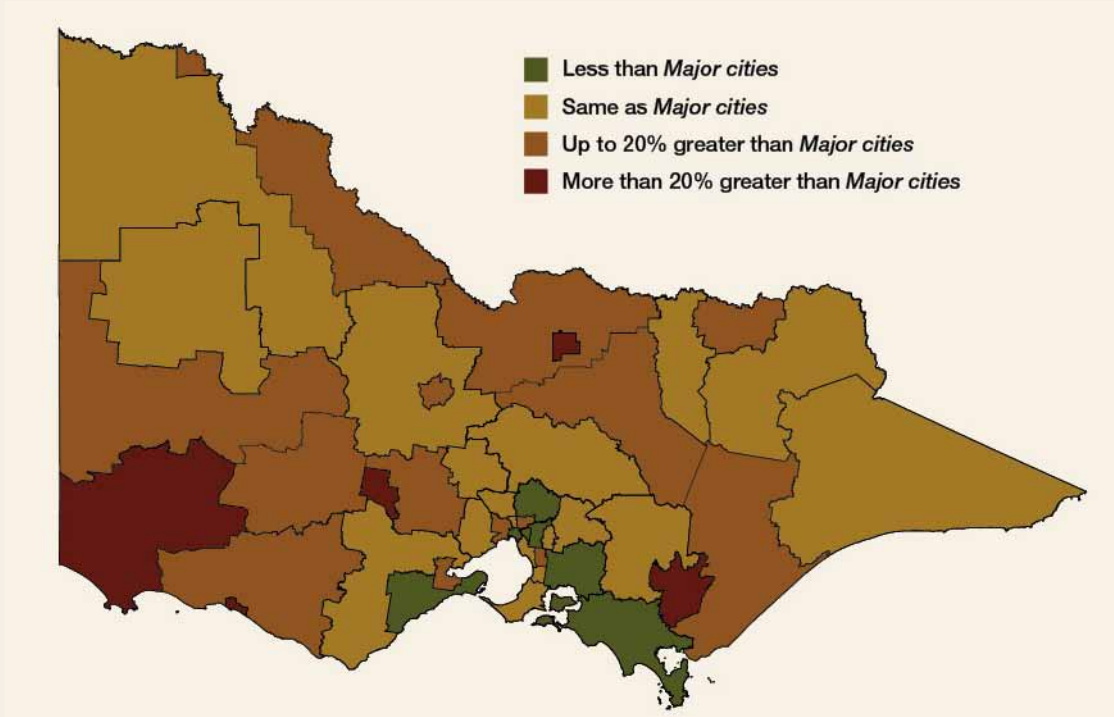
Note: ACT excluded from analysis.

Source: AIHW National Mortality Database.

Compared with Australian *Major cities*, death rates were:

- lower in six Sydney SSDs (including Lower and Central Northern Sydney, the Inner West and Eastern Suburbs) and one SSD outside Sydney (Snowy Mountains)
- over 20% higher in Dubbo, Lachlan, Bathurst-Orange, Central Murray and the Southern Tablelands.

Figure 10: Mortality compared with Australian *Major cities* by SSD, New South Wales, 2004-06



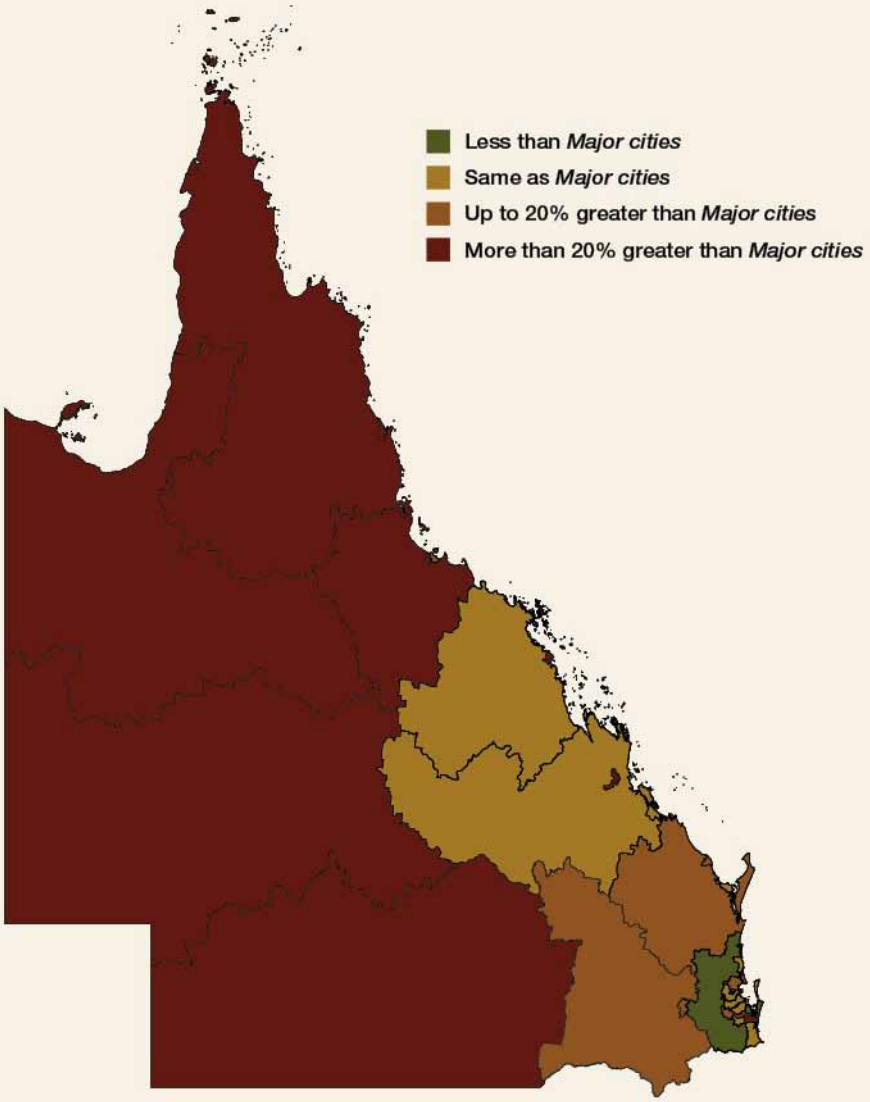
Source: AIHW National Mortality Database.

Compared with Australian *Major cities*:

- five Melbourne SSDs had significantly lower death rates—Inner Melbourne, Boroondara, Eastern Middle Melbourne, Northern Outer Melbourne and South Eastern Outer Melbourne
- East Barwon and South Gippsland (areas outside Melbourne) also had lower death rates.

Unlike NSW, there was no clear pattern regarding relatively higher mortality rates outside Melbourne. Areas with death rates more than 20% higher than Australian *Major cities* included La Trobe, Glenelg, Warrnambool and Ballarat.

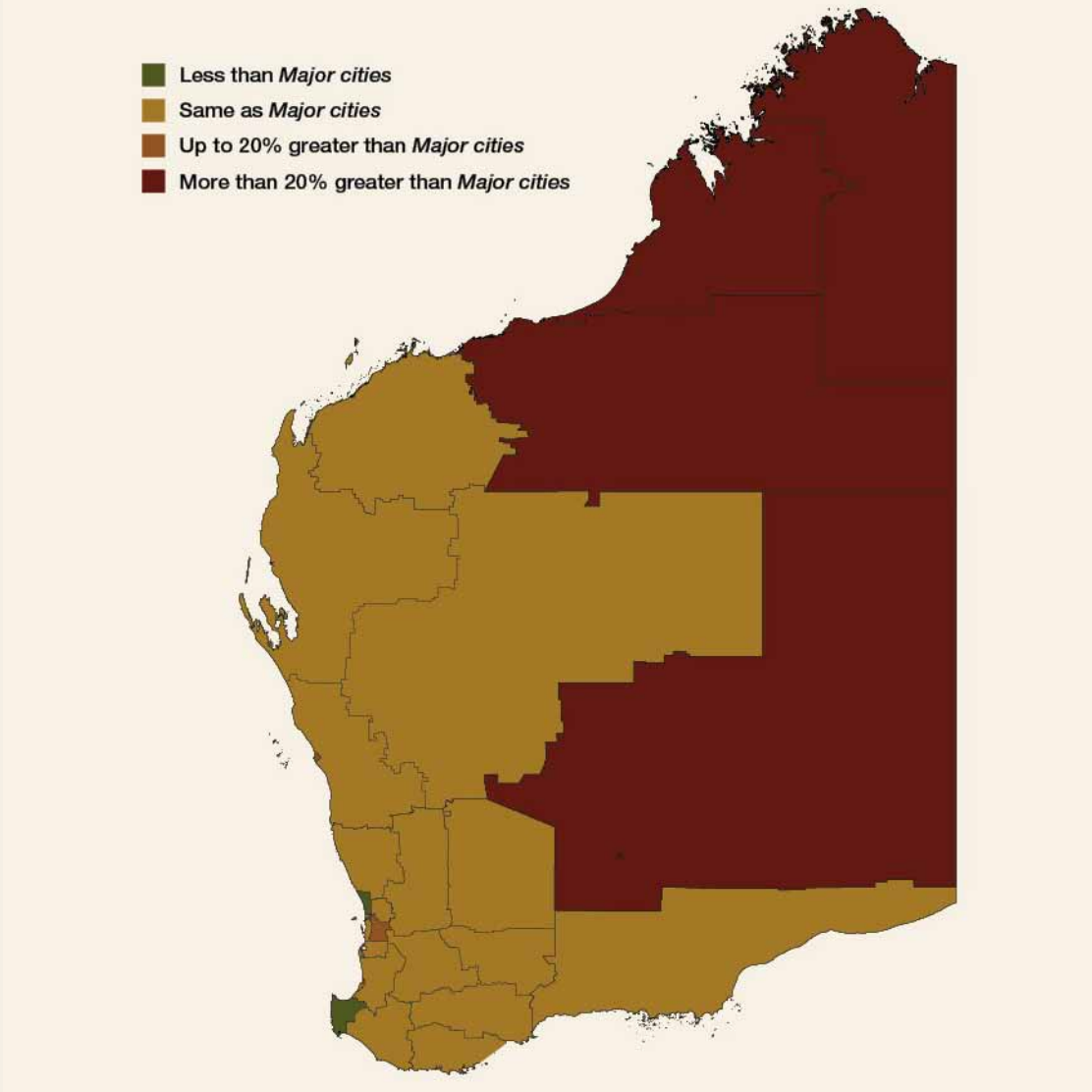
Figure 11: Mortality compared with Australian *Major cities* by SSD, Victoria, 2004-06



Source: AIHW National Mortality Database.

- Death rates were significantly lower than Australian *Major cities* in Moreton (just outside of Brisbane), and similar in Sunshine Coast, Hervey Bay, Gladstone, Fitzroy and Mackay.
- Most of the north and west of Queensland had death rates that were more than 20% higher than Australian *Major cities*.

Figure 12: Mortality compared with Australian *Major cities* by SSD, Queensland, 2004-06

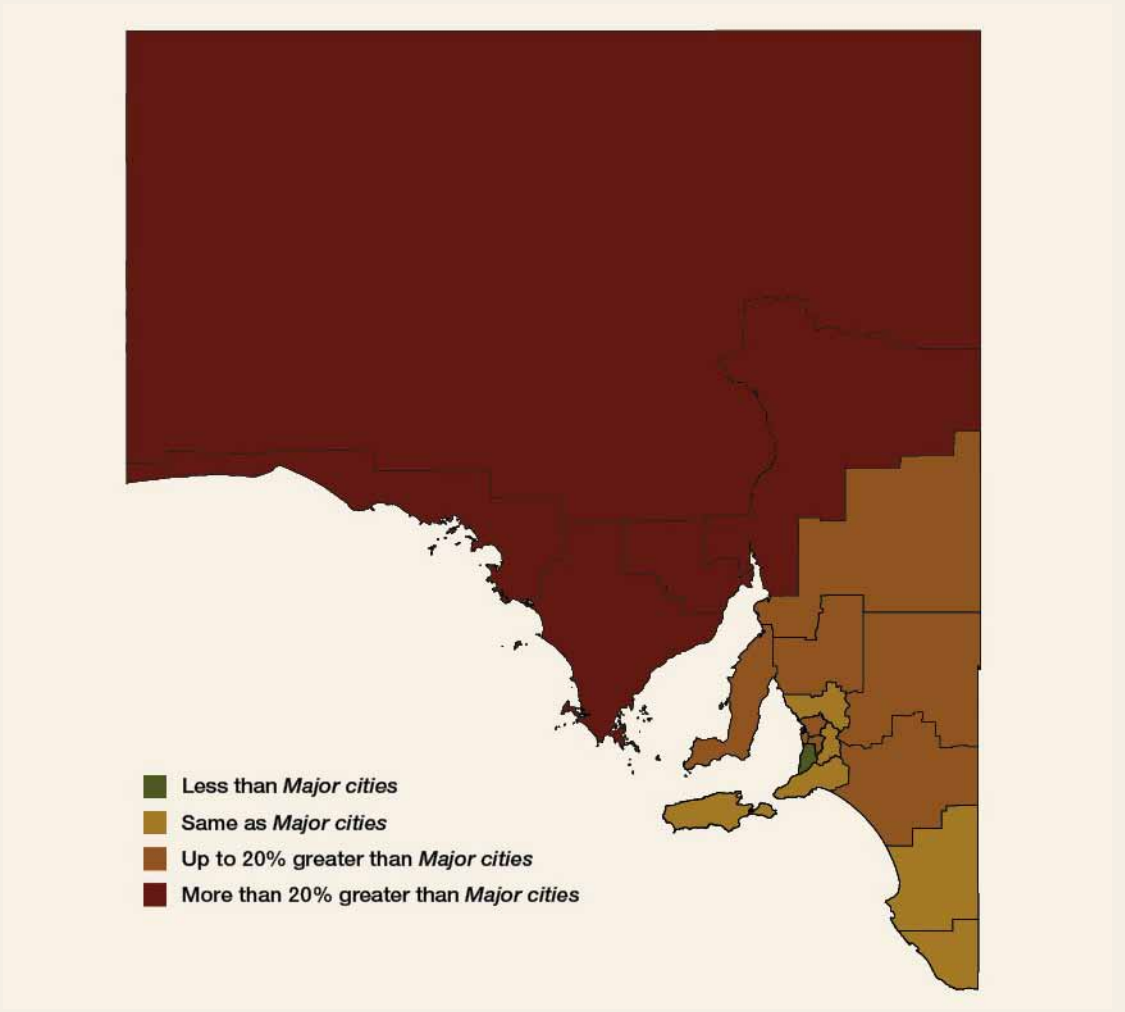


Source: AIHW National Mortality Database.

Compared with Australian *Major cities*, mortality rates were:

- significantly lower in North Metropolitan Perth and Vasse
- slightly higher in South East Metropolitan Perth
- similar in the south and west of Western Australia
- over 20% higher in eastern and northern areas of the State.

Figure 13: Mortality compared with Australian *Major cities* by SSD, Western Australia, 2004-06

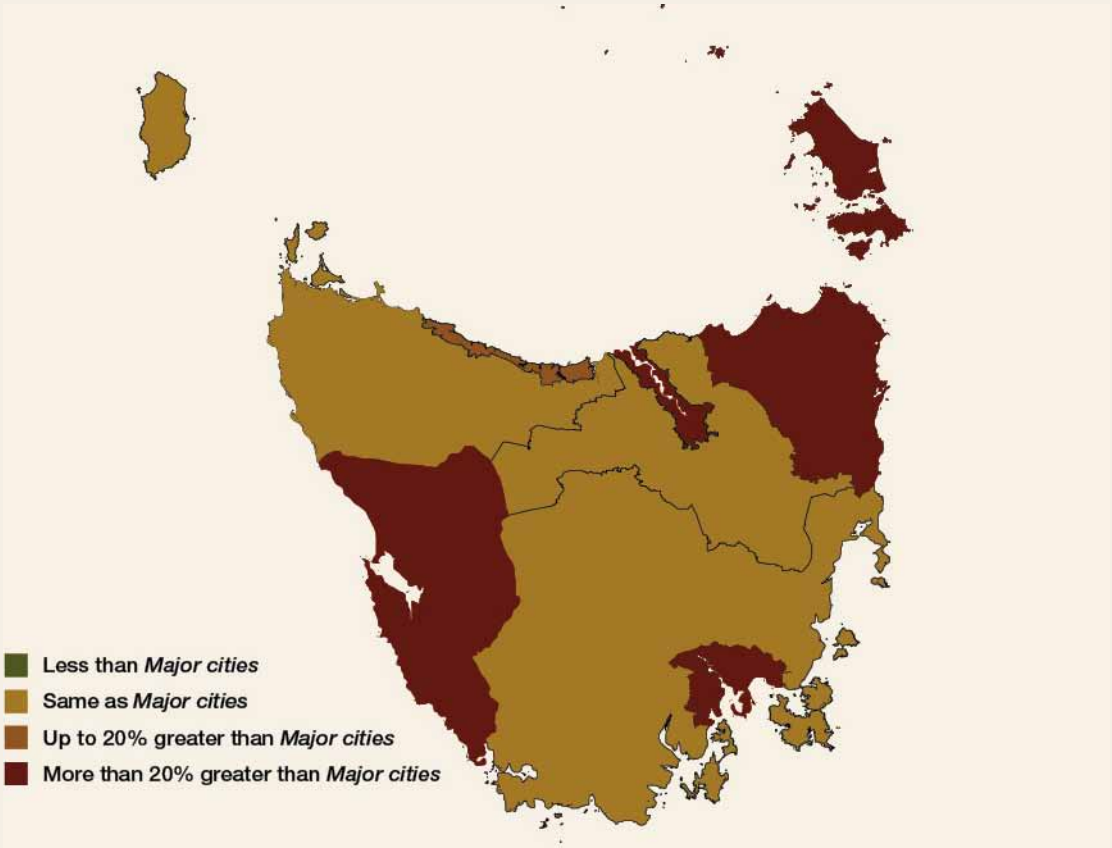


Source: AIHW National Mortality Database.

Compared with Australian *Major cities*, death rates were:

- lower in Southern Adelaide
- similar in Mt Lofty Ranges, Barossa, Fleurieu, Kangaroo Island and the south east
- over 20% higher in the north and west of the State.

Figure 14: Mortality compared with Australian *Major cities* by SSD, South Australia, 2004-06



Source: AIHW National Mortality Database.

Compared with Australian Major cities, death rates were:

- similar in the North Western, Southern and Central North SSDs
- slightly higher in Burnie-Devonport
- over 20% higher in Greater Hobart, Greater Launceston, North Eastern and the West Coast (Lyell).

Figure 15: Mortality compared with Australian *Major cities* by SSD, Tasmania 2004-06

Source: AIHW National Mortality Database.

- Mortality was over 20% higher than Australian *Major cities* throughout the Northern Territory.
- Death rates ranged from just over 20% higher in Litchfield and up to 270% higher in Bathurst-Melville.

Figure 16: Mortality compared with Australian *Major cities* by SSD, Northern Territory, 2004-06

Appendix A: Data sources and methods

Data sources

This section describes the data sources used in this report.

AIHW National Cancer Statistics Clearing House

Registration of cancers, excluding non-melanoma skin cancers, is required by law in each state and territory. Cancer registers collect clinical and demographic information about people newly diagnosed with cancer from hospitals, pathologists, oncologists, cancer treatment centres and nursing homes. Since 1982, all state and territory cancer registries supply records of new cases of cancer to the National Cancer Statistics Clearing House (NCSCH). The NCSCH is operated by the AIHW under the supervision of the Australasian Association of Cancer Registries.

AIHW National Mortality Database

Registration of deaths in Australia is the responsibility of the state and territory Registrars of Births, Deaths and Marriages. Information on the cause of death is supplied by the medical practitioner certifying the death, or by a coroner. Other information about the deceased is supplied by a relative or other person acquainted with the deceased or by an official institution where the death occurred. Registration of death is a legal requirement in Australia, and compliance is virtually complete.

The Registrars provide deaths data to the ABS for coding and compilation into national statistics. The AIHW also holds these data without unique identifiers in the National Mortality Database.

On the AIHW database, information on the deceased person's usual place of residence is coded to the spatial unit, Statistical Local Area (SLA) (see *Geographic data* below) for the corresponding year of death registration. For example, the usual places of residence for those whose death was registered in 2001 are coded to 2001 SLA boundaries. However, geographic information associated with 2006 mortality data is coded to 2005 SLA boundaries.

Bettering the Evaluation and Care of Health (BEACH)

BEACH is a continuous national study of general practice activity in Australia which began in April 1998. It is conducted by the Australian General Practice Statistics and Classification Centre—a collaborating centre of the AIHW and the University of Sydney.

BEACH data are collected from a random sample of GPs using a paper-based form, and each participating GP is required to provide details for 100 consecutive GP-patient encounters. The BEACH survey involves around 1,000 GPs a year, recruited from random samples of GPs who had claimed at least 375 general practice Medicare items in the previous 3 months. The survey is unique in Australia due to its capacity to link GP management activities (such as medications, referrals and investigations) to the patient's problem being managed.

The data items, patients' reasons for encounter, problems managed, clinical and procedural treatments, referrals and investigations ordered are classified according to the International Classification of Primary Care—Version 2 (ICPC-2) (Classification Committee of the World Organization of Family Doctors (WICC) 1998). The ICPC-2 is the standard data classification in primary care (AIHW 2005). The chapters of the classification are based on body systems, with additional chapters for psychological and social problems. The data items listed above are also coded more specifically in ICPC-2 PLUS, and interface terminology of terms used in general practice in Australia (Britt 1997).

For more information see *General practice activity in Australia 2007–08* (Britt et al. 2008). For information on the ICPC-2 and ICPC-2 PLUS codes used in this publication refer to Appendix Tables A1 and A2.

For consistency with other analysis in the publication, encounter data involving residents of *Major cities* has been used as the standard with which to compare general practice activity in Remoteness Areas. However, it is acknowledged that this may not be the best comparison due to evidence of overuse of general practitioners in urban areas.

Geographic and population data

Geographic data

The main purpose of the Australian Standard Geographical Classification (ASGC) is for collecting and disseminating geographically classified statistics (ABS 2006b). The ASGC consists of seven interrelated classification structures; analysis in this report uses the Main and Remoteness Structures. Each structure can be split into various spatial units with defined boundaries. For the Main Structure, these units are Census collection district (CD), Statistical Local Area (SLA), Statistical Subdivision (SSD), Statistical District and State/Territory. For the Remoteness Structure they are CD, Remoteness Area (RA) and State/Territory. Some spatial units (such as SLA) are updated annually, while others such as RA are only updated at Census years. All final analysis in this report is presented by RA (discussed in more detail in Section 2).

As data sources can include different geographic variables, such as postcode or SLA, data must be aggregated to the required spatial unit. This step is completed using ABS concordance files that outline the allocation of smaller spatial units to larger ones. As information on the individual's usual residence in the AIHW National Mortality Database is provided by SLA, concordance files were used to allocate SLAs to RA categories. Concordance files were also used to allocate SLAs to SSDs for the analysis of death rates by SSD across jurisdictions (Section 6). In both cases assignment of spatial units was completed on a proportional basis, for example, if an SLA was 80% *Inner regional* and 20% *Outer regional* the majority category was attributed (*Inner regional*).

The Australian Bureau of Statistics (ABS) provides estimated resident populations (ERP) for various geographic spatial units such as SLA (see below).

Population data

ABS ERPs were used to derive mortality rates in this report. The population data were sourced from the ABS Demography section using the most up-to-date estimates available at the time of analysis.

To derive their estimates of the resident populations, the ABS uses the 5-yearly Census of Population and Housing data and adjusts it as follows:

- all respondents in the Census are placed in their state or territory, SLA and postcode of usual residence; overseas visitors are excluded
- an adjustment is made for persons missed in the Census (approximately 2%)
- Australians temporarily overseas on Census night are added to the usual residence Census count.

ERPs are then updated each year from the Census data using indicators of population change, such as births, deaths and net migration. More information is available from the ABS website <www.abs.gov.au>. ERPs by Remoteness Area will be affected by changes in the ASGC structure, which occur at each Census year. In this report, ERPs at 30 June were used for calendar year data, and ERPs at 31 December were used for financial year data.

To calculate mortality rates for non-Indigenous men, the Indigenous ERP was used. This is considered to be experimental because satisfactory data on births, deaths and migration are not generally available and because of the volatility of counts of the Indigenous population between censuses.

Where possible, analysis in this report has used ERPs and geographic boundaries that correspond with the year of data being analysed. However, where this has not occurred, a note has been placed under the relevant table.

2004–05 ABS National Health Survey

The National Health Survey (NHS), conducted every 3 years by the ABS, is designed to obtain national information on the health status of Australians, their use of health services and facilities, and other health-related aspects of their lifestyle (ABS 2006a). The survey is community-based and does not include information from people living in non-private dwellings or institutions (for example, nursing homes, hospitals or prisons). The most recent survey was conducted in 2007–08 with previous surveys being conducted in 2004–05, 2001, 1989–90, 1983 and 1977.

2006 Adult Literacy and Life Skills Survey

The Adult Literacy and Life Skills Survey (ALLS) was conducted in Australia from June 2006 to January 2007 as part of an international study coordinated by Statistics Canada and the Organisation for Economic Co-operation and Development (OECD). Drawing upon a sample of 8,988 dwellings/persons, the survey provides information on the knowledge and skills of 15 to 74 year olds in the following four domains: prose literacy, document literacy, numeracy and problem solving. A fifth domain measuring health literacy proficiency was produced as a by-product of these domains. The ALLS was conducted in both urban and rural areas in all states and territories, except for very remote parts of Australia.

2007 National Drug Strategy Household Survey

The National Drug Strategy Household Survey is conducted by the AIHW at 3-yearly intervals. It collects comprehensive information about people's use and attitudes towards tobacco, alcohol and illicit drugs; experiences of alcohol and other drug-related harm; and physical and mental health. The latest survey, conducted in 2007, was the ninth in a series that began in 1985, and collected information from over 23,000 respondents. People living in non-private dwellings and institutions are not included in the sample.

2007 ABS National Survey of Mental Health and Wellbeing

The National Survey of Mental Health and Wellbeing was conducted by the ABS in 2007 using a nationally representative sample of 8,841 respondents aged between 16 and 85. The survey provides information on the prevalence of selected lifetime and 12-month mental disorders by three major disorder groups—anxiety disorders, affective disorders and substance use disorders. To estimate the prevalence of mental health disorders, the survey uses the World Health Organization's (WHO) World Mental Health Composite International Diagnostic Interview, version 3.0 (WMH-CIDI 3.0). The WMH–CIDI 3.0 provides an assessment of mental disorders based upon the definitions and criteria of two classification systems: the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) and the WHO International Classification of Diseases, Version 10 (ICD-10). In this report the prevalence of a lifetime disorder has been analysed 'with hierarchy'. This means that certain exclusion rules are applied when a person has symptoms for a particular condition, but the symptoms are believed to be accounted for by the presence of another disorder.

The National Survey of Mental Health and Wellbeing also provides information on the level of impairment, health services used for mental health problems, physical conditions, social networks and caregiving, as well as demographic and socioeconomic characteristics. The survey was previously run in 1997 as the National Survey of Mental Health and Wellbeing of Adults.

Data methods

Age standardisation

Age-standardised rates enable comparisons to be made between populations with different age structures. Two methods of age-standardisation—referred to as direct and indirect standardisation—have been used in this report. The majority of comparative analysis in this report uses the indirect method because several of the populations of interest are small and the counts of events or services in these areas are also relatively small (see Section 2 for a detailed description of this method). However, where sample size has allowed, the direct method of age-standardisation has been used, in which the age-specific rates are multiplied by a constant population. The direct method used in the calculation of age-standardised rates consists of the following steps:

Step 1: Calculate the age-specific rate for each group.

Step 2: Calculate the expected number of cases in each age group by multiplying the age-specific rates by the corresponding standard population and dividing by 100,000 to get the expected number of cases.

Step 3: Sum the expected number of cases in each age group, divide by the total of the standard population and multiply by 100,000. This gives the age-standardised rate.

Calculation of confidence intervals

The observed value of a rate may vary due to chance or natural variation even where there is no variation in the underlying value of the rate. To help determine whether calculated rates are meaningfully different from one geographical area to another, confidence intervals have been calculated. Where confidence intervals miss each other completely, the differences are considered to be 'significant'; that is, there is at least 95% confidence that the change in a rate is greater than could have occurred by chance.

In tables presented in this report, estimates significantly different from those in *Major cities* are accompanied by an asterisk. Often, differences in the underlying condition of the population are not statistically significant. This can be due to the fact that there is little difference, or because the numbers of cases or observations are so small as to make it difficult to discern any real statistically significant difference. All such non-significant differences should be treated cautiously, as taken together they may point to a pattern or trend.

Confidence intervals in survey data

The following method of calculating confidence intervals has been used where the available data are weighted estimates based on survey data (for example, the National Health Survey).

The lower 95% confidence limit (L95%CL) = (O/E) – (1.96*SE)

The upper 95% confidence limit (U95%CL) = (O/E) + (1.96*SE)

The standard error (SE) of the estimate for O/E (Kendall & Stuart 1969) was calculated as:

$$SE = \frac{\sqrt{[(O/E)^2 \times VARe] + VARo}}{E^2}$$

where:

O/E = the ratio of the observed to expected number of cases

O = the number of observed cases. The ABS provided weighted estimates of the total number of cases, based on the number of cases in the survey and a weighting factor

E = the number of expected cases (based on the numbers of observed cases)

$VARo$ = the variance for the total number of observed cases

The variance is the square of the standard error associated with the observed or expected number, calculated by the ABS and provided with the base data:

$$VARe = \Sigma(pop/POP)^2 \times (SEe)^2$$

where:

pop = the population in each area in a specific age group

POP = the standard population in a specific age group

SEe = the standard error of the expected synthetic number of cases in the area in a specific age group

Confidence intervals for mortality data

Confidence intervals for death rates were calculated on the basis of the number of observed deaths using the square-root transform described in Breslow & Day (1987). This method has been used where

observed and expected cases have been actual counts. Life expectancy confidence intervals were calculated using the revised Chiang method as described in Toson & Baker (2003).

Confidence intervals for BEACH data

The method used to calculate confidence intervals in this report is consistent with that used by the Australian GP Statistics and Classification Centre (see Britt et al. 2008). As BEACH is a single stage cluster sample study design, the variance has been adjusted to account for the correlation between observations within clusters, and the confidence intervals adjusted accordingly.

Analysis of mortality data

Mortality analysis

To calculate the standardised mortality ratio by RA for the period of 2004–06, deaths were allocated to RA based on the recorded SLA for place of usual residence of the deceased. In general, the SLA provided corresponds with the SLA boundaries for the corresponding year of death registration. However for 2006 mortality data, the SLAs correspond to 2005 SLA boundaries. The population at risk in each area was calculated using 2004, 2005 and 2006 ERPs in each RA category, based on the 2001 RA boundaries.

Non-Indigenous

Analysis of non-Indigenous mortality (Table 13 and Appendix Table B9) was limited to Queensland, Western Australia, South Australia and the Northern Territory—the four jurisdictions which were considered to have the most complete coverage of Indigenous deaths at time of publication. Since then, NSW mortality data has also been considered of acceptable quality for reporting.

Calculation of the population at risk (total non-Indigenous population in each area) involved subtracting the Indigenous population from the total population of an area. It is acknowledged that this is an estimate only as the quality of Indigenous identification in the Census and births, deaths and migration is limited. As estimates of the Indigenous population by RA are only available every Census year, 2006 population estimates were used as an approximation for the non-Indigenous population at risk.

Measuring socioeconomic status

The most widely used measures of socioeconomic status are the ABS Socioeconomic Indexes for Areas (SEIFA). This suite of four indexes aims to represent the socioeconomic status of Australian communities and identify areas of advantage and disadvantage (ABS 2008). One of these indexes—the Index of Relative Socioeconomic Disadvantage (IRSD)—is used throughout this report.

The IRSD summarises 17 variables associated with the social and economic resources of people and households in an area. These include low income, low educational attainment, high unemployment, jobs in relatively unskilled positions, a high proportion of people identifying as Indigenous and high levels of housing stress (Baker & Adhikari 2007). Each small area is given a 'score' based upon these characteristics which is then used to rank all areas on a continuum from most disadvantaged (a low value) to least disadvantaged (a high value). Often, the IRSD is used to group populations into quintiles. These quintiles can be area-based or population-based. This publication uses area-based quintiles—

derived by grouping SLAs into 5 equal groups—for the basis of any analysis using SEIFA. In this report the term 'lowest SES' is used to describe people living in areas classified as being in the bottom 40% of Australia and 'highest SES' for those living in areas classified as being in the top 40% of areas.

It is incorrect to state that an area with a low IRSD score is absolutely disadvantaged. It can only be determined that the area is disadvantaged relative to *Other* areas (ABS 2008). Within any geographic area, there will naturally be individuals and sub-groups with different characteristics to the overall population. As such, it is possible for a relatively advantaged household to live within a relatively disadvantaged area, and vice versa.

Data tables

Table A1: ICPC-2 chapters

Reasons for encounter	ICPC-2 Code
General and unspecific	A
Blood	B
Digestive	D
Eye	F
Ear	H
Cardiovascular	K
Musculoskeletal	L
Neurological	N
Psychological	P
Respiratory	R
Skin	S
Endocrine	T
Urological	U
Male genital	Y
Social	Z

Table A2: Code groups from ICPC-2 and ICPC-2 PLUS

Problems managed

Group	ICPC-2 and/or ICPC-2 PLUS code
Acute bronchitis/bronchiolitis	R78
Arthritis	L88,L89,L90,L91,L70009,L70010,L70021,L81003, L83010,L84003,L84023,L84024,L84025,L84026,L89004,L90004, L91009,L91010,L91011,L91012, L91007,L91013,L91014,L92006,S91002, T99063,L81015,L92011 L83011,L84004,L84009,L84010,L84011,L84012 L89001,L90001,L91001,L91003,L92007, L91008,L91015,
Asthma	R96
Back complaint	L02,L03,L86
Check-up—all	A30,A31,B30,B31,D30,D31,F30,F31,H30,H31,K30,K31,L30,L31,N30, N31,P30,P31,R30,R31,S30,S31,T30,T31,U30, U31 Y30,Y31,Z30,Z31
Diabetes—all	T89,T90,W85
Depression	P03,P76
Gastroenteritis	D70,D73
Hypertension (problems)	K86,K87,W81002,W81003,
Lipid disorder	T93,T99075
Oesophagus disease	D84
Immunisation/vaccination—all	A44,N44,R44,D44
Prescription—all	A50,B50,D50,F50,H50,K50,L50,N50,P50,R50,S50,T50,U50,Y50, Z50
Upper respiratory tract infection	R74
Sprain/strain	L19014,L77,L78,L79,L83023,L83024,L84020, L84021,L83025

Appendix B: Detailed tables

Table B1: Prevalence of health determinants by ASGC RA, men, 2004–05

Selected health determinant	MC (crude)	Outside MC (crude)	MC	IR	OR+R	Outside MC
	Per cent		Rate ratio			
High blood pressure	14.5	17.5	1.00	1.08	1.06	1.07
High cholesterol	10.9	10.2	1.00	0.84*	0.85	0.84*
Insufficient fruit intake[(a)]	52.0	52.3	1.00	0.99	1.09*	1.03
Insufficient vegetable intake[(b)]	89.3	82.5	1.00	0.93*	0.93*	0.93*
Insufficient physical activity to confer a health benefit[(c)]	57.8	61.9	1.00	1.03	1.14*	1.07*
Overweight/obese body weight[(d)]	58.2	63.2	1.00	1.02	1.12*	1.06*

* Significantly different from *Major cities* (p<0.05).

(a) An insufficient fruit intake is considered to be 1 or less serves of fruit per day.

(b) An insufficient vegetable intake is considered to be 4 or less serves of vegetables per day.

(c) Men undertaking no exercise or less than 300 minutes of exercise in the two weeks prior to the survey.

(d) Body mass index greater than or equal to 25, calculated from self-reported height and weight.

Notes

1. Data are age-standardised to the 2004–05 National Health Survey population.
2. Self-assessed health status, body weight and physical activity data calculated for men aged 15+ years, fruit and vegetable intake for men aged 12+ years and high blood pressure and high cholesterol for men aged 25+ years.

Source: AIHW analysis of the ABS National Health Survey 2004–05.

Table B2: Prevalence of alcohol and other drug use by ASGC RA, men, 2007

Selected health determinant	MC (crude)	Outside MC (crude)	MC	IR	OR	R+VR	Outside MC
	Per cent		Rate ratio				
Daily smoking	16.3	18.3	1.0	1.4*	1.5*	1.7*	1.4*
Risky/high risk consumption of alcohol[(a)]	16.0	19.7	1.0	1.3*	1.4*	1.5*	1.3*
Recent use of illicit drugs[(b)]	16.6	15.1	1.0	1.0	1.0	1.2	1.0
Recent use of illicit drugs (excluding cannabis)	9.6	7.6	1.0	0.9	0.7*	1.2	0.9

* Significantly different from *Major cities* (p<0.05).

(a) Consumption of alcohol at a level considered a risk/high risk to health in the short or long term by the National Health and Medical Research Council (NHMRC) at time of survey (NHMRC 2001).

(b) Used at least one of 16 illicit drugs in the last 12 months.

Notes

1. Data are age-standardised to the 2007 National Drug Strategy Household Survey population.
2. Data are for men aged 15 years or older.

Source: AIHW analysis of the 2007 National Drug Strategy Household Survey.

Table B3: Adequate health literary by ASGC RA, men, 2006

Literacy	MC (crude)	Outside MC (crude)	MC	IR	OR + R
	Per cent		Rate ratio		
Adequate health literacy[a]	42.3	38.2	1.00	0.88*	0.77*

* Significantly different from *Major cities* (p<0.05).

(a) Health literacy of level 3 or above. Level 3 is internationally regarded as the minimum required for individuals to meet the complex demands of everyday life and work in the emerging knowledge-based economy (ABS 2006).

Notes

1. Data are directly age-standardised to the 2001 Australian population.

Source: AIHW analysis of ABS Adult Literacy and Life Skills Survey 2006.

Table B4: Prevalence of health conditions by AGSC RA, men, 2004–05

Selected health conditions	MC (crude)	Outside MC (crude)	MC	IR	OR+R	Outside MC
	Per cent		Rate ratio			
Arthritis[a]	17.2	24.4	1.00	1.29*	1.29*	1.29*
Asthma	8.7	9.6	1.00	1.18*	0.95	1.11
Bronchitis	1.8	2.6	1.00	1.16	1.66*	1.42*
All cardiovascular disease[b]	16.5	18.6	1.00	1.06	1.00	1.13*
Coronary heart disease[c]	8.7	10.8	1.00	1.26	1.06	1.18
Chronic obstructive pulmonary disease[d]	2.4	3.6	1.00	1.31	1.59*	1.51*
Type 2 diabetes	7.9	6.7	1.00	0.77*	0.89	0.82*
Injury in the previous 4 weeks	17.6	2.1	1.00	1.18*	1.18*	1.18*
Long-term condition as a result of an injury	12.5	14.7	1.00	1.18*	1.19*	1.18*

* Significantly different from *Major cities* (p<0.05).

(a) Arthritis includes rheumatoid arthritis, osteoarthritis and other/unknown types of arthritis.

(b) All cardiovascular disease covers all diseases and conditions of the heart and blood vessels.

(c) Coronary heart disease includes heart attack, angina and other ischaemic heart diseases.

(d) Chronic obstructive pulmonary disease (COPD) includes emphysema and bronchitis.

Notes

1. Data are age-standardised to the 2004–05 National Health Survey population.
2. Data on arthritis are limited to men aged 25+ years and data for Type 2 diabetes and coronary heart disease are limited to men aged 40+ years.

Source: AIHW analysis of the ABS National Health Survey 2004–05.

Table B5: Summary of changes in male health status between 1995 and 2004–05, inside and outside *Major cities*

Health conditions	MC	Outside MC
	Rate ratio	
Diabetes	1.56*	1.60*
Osteoporosis	2.54*	2.79*
Asthma	0.86*	0.85*
Bronchitis	0.56*	0.91
Short-term injury[(a)]	1.42*	1.42*
Long-term condition due to injury[(a)]	0.89*	0.88*
Arthritis	0.99	1.07
Self-assessed health status (very good/excellent)	1.09*	0.99

* Significantly different from *Major cities* ($p<0.05$).

(a) Injury analysis between 2001 and 2004–05.

Note: Data are self-reported in the ABS National Health Survey.

Source: AIHW 2008c.

Table B6: Proportion of total deaths in each age group (per cent) by ASGC RA, men, 2004–06

Age	MC	IR	OR	R	VR	Outside MC
0–4	1.2	1.0	1.4	2.2	3.4	1.2
5–14	0.2	0.2	0.3	0.4	1.0	0.3
15–24	1.2	1.4	1.7	2.6	5.4	1.6
25–34	2.0	1.8	2.0	3.7	7.3	2.1
35–44	3.0	2.9	3.3	6.9	11.8	3.4
45–54	5.8	5.6	6.6	9.1	13.1	6.3
55–64	10.8	10.8	12.4	14.7	16.4	11.6
65–74	18.4	20.0	21.2	21.6	18.7	20.4
75 and over	57.4	56.2	51.0	38.8	22.8	53.0

Source: AIHW National Mortality Database.

Table B7: Ratios for deaths due to all causes compared with *Major cities* by ASGC RA and age group, men, 2004–06

Age	MC (crude)	Outside MC (crude)	MC	IR	OR	R	VR	Outside MC
	Deaths per 100,000		Standardised mortality ratio					
0–14	46	54	1.00	1.07	1.37*	1.58*	2.48*	1.24*
15–24	51	94	1.00	1.53*	2.03*	2.62*	4.87*	1.83*
25–44	102	158	1.00	1.36*	1.46*	2.14*	3.99*	1.52*
45–64	433	520	1.00	1.10*	1.25*	1.41*	2.21*	1.19*
65+	4,223	4,302	1.00	1.05*	1.08*	1.09*	1.18*	1.06*
Total	623	757	1.00	1.08*	1.14*	1.25*	1.78*	1.11*
Total <65	170	231	1.00	1.16*	1.32*	1.62*	2.78*	1.28*

* Significantly different from *Major cities* (p<0.05).

Source: AIHW National Mortality Database.

Table B8: Ratios for deaths due to all causes compared with 2002–04 by ASGC RA, men, 2004–06

Year	MC (crude)	Outside MC (crude)	MC	IR	OR	R	VR	Outside MC
	Deaths per 100,000		Standardised mortality ratio					
2002–04	643	786	1.00	1.00	1.00	1.00	1.00	1.00
2004–06	623	757	0.94*	0.93*	0.93*	0.99	1.02	0.93*

* Significantly different from 2002–04 (p<0.05).

Source: AIHW National Mortality Database.

Table B9: Proportion of leading causes of excess death outside *Major cities* (per cent), non-Indigenous men, 2004–06

Cause	IR	OR	R	VR	Outside MC
Infectious diseases	0.1	0.5	–1.3	4.2	0.3
Neoplasms	34.7	28.2	17.0	12.1	31.0
colorectal	2.2	3.7	–5.2	–10.4	2.3
lung	6.7	9.2	10.0	15.4	8.0
melanoma	1.4	0.6	–3.8	–3.4	0.8
oral cavity	1.0	2.5	3.4	15.0	1.9
prostate	5.9	3.9	0.9	2.4	4.8
Diabetes	2.8	5.3	17.8	8.6	4.4
Nervous system disorders	1.8	–0.3	–8.8	–12.1	0.3
Circulatory diseases	30.6	25.7	21.4	20.0	28.0
coronary heart disease	18.7	17.0	5.0	–2.2	17.1
cerebrovascular	5.8	–1.1	–8.6	0.7	2.4
other circulatory diseases	6.0	9.7	25.0	21.5	8.5
Respiratory diseases	4.3	6.6	0.9	7.8	5.2
COPD	7.6	10.2	18.3	22.4	9.3
Digestive	1.6	4.3	0.2	–0.7	2.6
Musculoskeletal	0.2	0.2	0.7	2.0	0.2
Injury and poisoning	17.0	24.5	53.9	58.3	22.1
assault	0.6	0.3	0.0	2.6	0.5
falls	1.0	0.6	1.8	–1.9	0.8
MVA	7.2	8.4	26.8	26.2	8.8
other land transport	0.9	1.1	3.0	7.9	1.1
suicide	4.8	6.9	12.9	5.8	6.0
all other injuries/poisoning	2.5	7.3	9.3	17.7	5.0

Source: AIHW National Mortality Database.

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