



3.2 Premature mortality

In Australia, as in most developed countries, the vast majority of deaths occur at older ages: the median age at death in 2013 was 82 years. In general, cancers and chronic diseases, such as coronary heart disease, are the leading causes of death at older ages. Deaths due to external causes of injury and poisoning, such as suicide and accidents, are more common among people younger than 45. Summary mortality statistics are usually influenced by diseases among the elderly and are less reflective of the patterns of deaths in younger age groups.

This article measures and describes the impact of premature mortality in Australia—that is, deaths among people younger than 75 (see Box 3.2.1). It highlights and expands on the web report, [Premature mortality in Australia 1997–2012](#) and on the accompanying series, [Leading cause of premature mortality in Australia](#) fact sheets.

Box 3.2.1: Measuring premature mortality

'Premature mortality' refers to deaths that occur at an age earlier than a selected cut-off. For this analysis, deaths among people aged under 75 are considered premature. This is a conservative cut-off—it is lower than the current median age at death (82 years in 2013) and the current life expectancy at birth (80 for males and 84 for females in 2013). It was chosen to allow for comparisons over time, across population groups and between countries. Premature deaths can be summarised in terms of 'potential years of life lost' (PYLL). For example, if dying before the age of 75 is considered premature, then a person dying at age 40 would have lost 35 potential years of life. Premature mortality measures are distinct from burden of disease estimates, which normally uses the measure 'years of life lost' (YLL). See 'Chapter 3.1 Burden of disease and injury in Australia'.

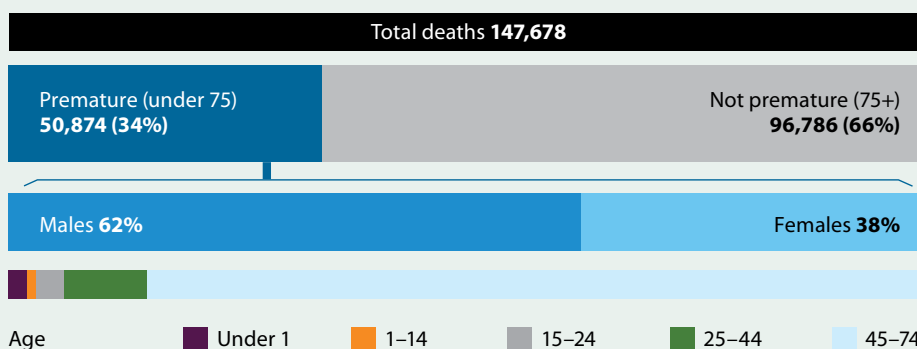
Despite relatively high standards of health and health care in Australia, not all Australians fare equally well in terms of their health and longevity, including premature mortality (AIHW 2014). This article also examines differences in premature mortality among different population groups, specifically among people living outside *Major cities* or in lower socioeconomic areas.

Overview of premature mortality in Australia

Of all deaths in Australia in 2013, about 1 in 3 (34%) occurred among people aged under 75 (Figure 3.2.1), representing 50,900 premature deaths. This equates to a premature mortality rate of 235 deaths per 100,000 population (or about 1 in 426) aged under 75 or, put another way, there were 861,000 potential years of life lost as a result of death before the age of 75. Males accounted for 62% of premature deaths, and 85% of premature deaths were of people aged 45–74. A greater proportion of premature deaths were among infants aged under 1 (2.2%) than among children aged 1–14 (1.0%).



Figure 3.2.1: Premature mortality in Australia, by age and sex, 2013



Source: AIHW National Mortality Database; Table S3.2.1.

The leading cause of premature death in 2011–2013 was coronary heart disease (10% of deaths among people aged under 75; see Table 3.2.1). Lung cancer (8.9%) was second but was the leading cause among females aged under 75. Suicide (4.6%) was the third leading cause of premature death and the greatest contributor to potential years of life lost. The top 10 causes of premature death together contributed 46% to the total causes of premature death.

Two of the leading causes of premature death among females are diseases that mainly affect females—more than 99% of breast cancer diagnoses (which ranked second among the 10 leading causes of premature death for women) are among females; and ovarian cancer (which ranked 9th) exclusively affects females.

Note that many of the following tables combine 3 years of data to reduce the effect of variations in death rates from year to year.

The leading causes of premature death differ by age (Figure 3.2.2). In general, deaths from chronic disease and cancer were more common among people aged 45 and over, while injury and accidental poisoning deaths were more common among people aged 1–44. (Accidental poisoning may result from agents such as alcohol, narcotics, sedatives and anti-inflammatory drugs.) Among infants, conditions originating in the perinatal period and congenital conditions were responsible for most deaths.



Table 3.2.1: Top 10 leading causes of premature death by sex, 2011–2013

	Males			Females			People		
	Cause of death	Number	%	Cause of death	Number	%	Cause of death	Number	%
1	Coronary heart disease	11,887	12.7	Lung cancer	5,336	9.3	Coronary heart disease	15,223	10.1
2	Lung cancer	8,141	8.7	Breast cancer	5,259	9.2	Lung cancer	13,477	8.9
3	Suicide	5,161	5.5	Coronary heart disease	3,336	5.8	Suicide	6,881	4.6
4	Colorectal cancer	3,572	3.8	COPD	2,303	4.0	Colorectal cancer	5,867	3.9
5	COPD	3,003	3.2	Colorectal cancer	2,295	4.0	COPD	5,306	3.5
6	Cerebrovascular disease	2,995	3.2	Cerebrovascular disease	2,268	4.0	Breast cancer	5,296	3.5
7	Land transport accidents	2,672	2.9	Cancer, unknown, ill-defined	1,770	3.1	Cerebrovascular disease	5,263	3.5
8	Liver disease	2,665	2.8	Suicide	1,720	3.0	Cancer, unknown, ill-defined	4,346	2.9
9	Cancer, unknown, ill-defined	2,576	2.8	Ovarian cancer	1,600	2.8	Liver disease	3,836	2.5
10	Diabetes	2,425	2.6	Pancreatic cancer	1,589	2.8	Pancreatic cancer	3,826	2.5

Notes

1. COPD refers to chronic obstructive pulmonary disease.
2. % refers to the percentage of all deaths.

Source: AIHW National Mortality Database; Table S3.2.2.



Figure 3.2.2: Top five leading causes of premature death, by age, 2011–2013

	Age group					
	Under 1	1–14	15–24	25–44	45–64	65–74
1	Perinatal & congenital	Land transport accidents	Suicide	Suicide	Coronary heart disease	Coronary heart disease
2	SIDS	Perinatal & congenital	Land transport accidents	Accidental poisoning	Lung cancer	Lung cancer
3	Ill-defined causes	Brain cancer	Accidental poisoning	Land transport accidents	Breast cancer	COPD
4	Accidental threats to breathing	Accidental poisoning	Assault	Coronary heart disease	Colorectal cancer	Cerebrovascular disease
5	Selected metabolic disorders	Cerebral palsy & related	Event of undetermined intent	Breast cancer	Suicide	Colorectal cancer

Notes

- Colours indicate the broad cause of death category (blue = chronic disease, orange and brown = cancer, purple and pink = injury and poisoning, green = other cause of death).
- While cancers have been distinguished from other chronic diseases in this figure, they are also classed as chronic diseases.
- 'COPD' refers to chronic obstructive pulmonary disease.

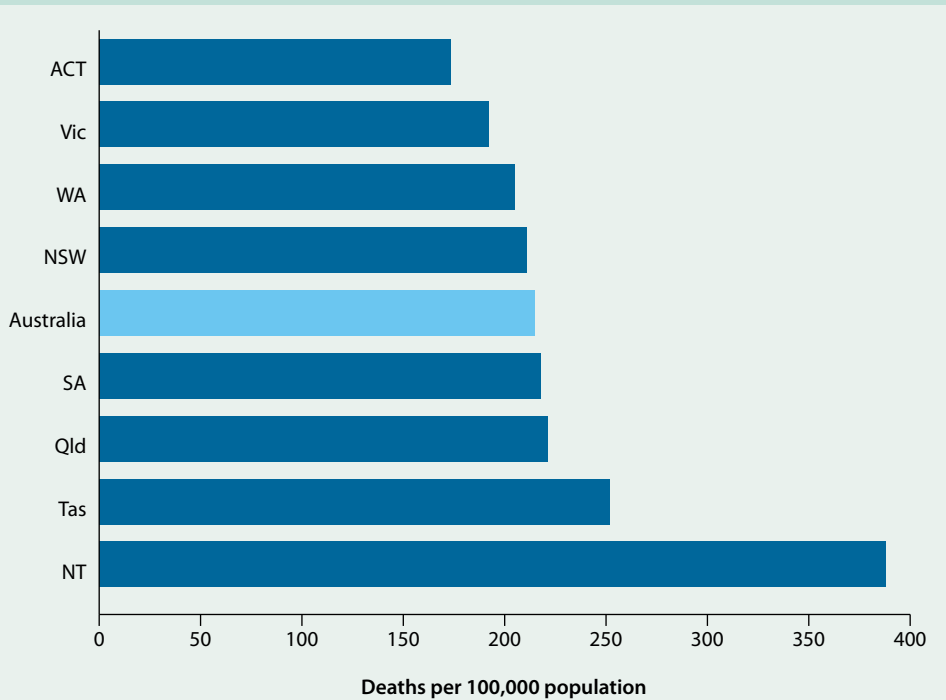
Source: AIHW National Mortality Database; Table S3.2.2.

State and territory analysis

The rate of premature mortality varied considerably between states and territories in 2011–2013 (Figure 3.2.3). After adjusting for differences in age structure, the Australian Capital Territory had the lowest rate (173 deaths per 100,000 people aged under 75), followed by Victoria (192) and Western Australia (205). The age-standardised premature mortality rate in the Northern Territory (388) was more than twice as high as the rate in the Australian Capital Territory. The Northern Territory has the highest proportion of Indigenous residents (about 30%) of all Australian states and territories and the majority of the Northern Territory's land mass is classified as remote (Taylor & Bell 2013). The following section, 'Inequalities in premature mortality', describes the impact of remoteness of residence and Indigenous status on premature death.



Figure 3.2.3: Age-standardised premature mortality rates, by state and territory, 2011–2013



Source: AIHW National Mortality Database; Table S3.2.3.

The leading causes of premature death were similar across all states and territories (Table S3.2.3). Coronary heart disease and lung cancer were the two leading causes of death in all jurisdictions and suicide consistently featured in the top five. The most notable difference was that diabetes was the third leading cause of premature death in the Northern Territory (6.3%, compared with 2.5% and 11th ranking across Australia).

Inequalities in premature mortality

Premature mortality affects certain population groups disproportionately. This section discusses premature mortality in relation to remoteness of residence, socioeconomic groups and Indigenous status. Box 3.2.2 outlines measures of inequality.



Box 3.2.2: Measures of inequality

To calculate measures of inequality, each population group is compared with a relevant reference group. The reference group is the group with the most favourable outcome—that is, the lowest age-standardised premature mortality rate. (For example, *Major cities* is the reference group for remoteness areas, and the highest socioeconomic group is the reference group for socioeconomic comparisons.)

Relative inequality is represented by rate ratios—that is, the age-standardised premature mortality rate for the group of interest relative to (divided by) the rate for the reference group. A rate ratio of greater than 1 indicates that the rate for the group of interest is higher than the rate for the reference group. A rate ratio of less than 1 indicates that the rate for the group of interest is lower than the rate for the reference group. A rate ratio of 1 indicates that the rate for the group of interest is the same as the rate for the reference group.

Remoteness area

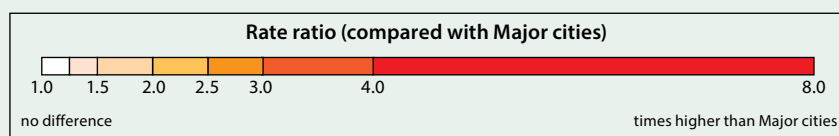
The majority of Australians live in *Major cities*, with fewer than 3 in 10 people (29% of the population) living in *Regional* and *Remote* areas (see 'Chapter 5.11 Rural and remote health'). Despite this, in 2011–2013, deaths in *Regional* and *Remote* areas accounted for 38% of premature deaths.

Premature mortality rates increased with remoteness. The premature mortality rate among people living in *Remote* areas was 1.6 times as high as the rate among people in *Major cities*, and in *Very remote* areas it was 2.2 times as high.

Figure 3.2.4 shows the top five causes of premature death for each remoteness area. Coronary heart disease was the leading cause for all areas, and mortality rates were between 1.2 and 3.3 times as high in *Regional* and *Remote* areas as in *Major cities*. Diabetes was the second leading cause of premature death in *Very remote* areas and the rate of dying from diabetes was 7.8 times as high as in *Major cities*. For premature deaths due to land transport accidents, rates were more than 5 times as high in *Remote* and *Very remote* areas as in *Major cities*.



Figure 3.2.4: Top five leading causes of premature death, by remoteness area, 2011–2013



	Remoteness area				
	Major cities	Inner regional	Outer regional	Remote	Very remote
1	Coronary heart disease	Coronary heart disease	Coronary heart disease	Coronary heart disease	Coronary heart disease
2	Lung cancer	Lung cancer	Lung cancer	Lung cancer	Diabetes
3	Suicide	Suicide	Suicide	Suicide	Lung cancer
4	Colorectal cancer	COPD	COPD	Land transport accidents	Suicide
5	Breast cancer	Colorectal cancer	Cancer, unknown, ill-defined	COPD	Land transport accidents

Notes

1. 'COPD' refers to chronic obstructive pulmonary disease.
2. Colours represent the rate ratio of the age-standardised premature mortality rate for each remoteness area, compared with the age-standardised premature mortality rate for *Major cities*.

Source: AIHW National Mortality Database; Table S3.2.4.

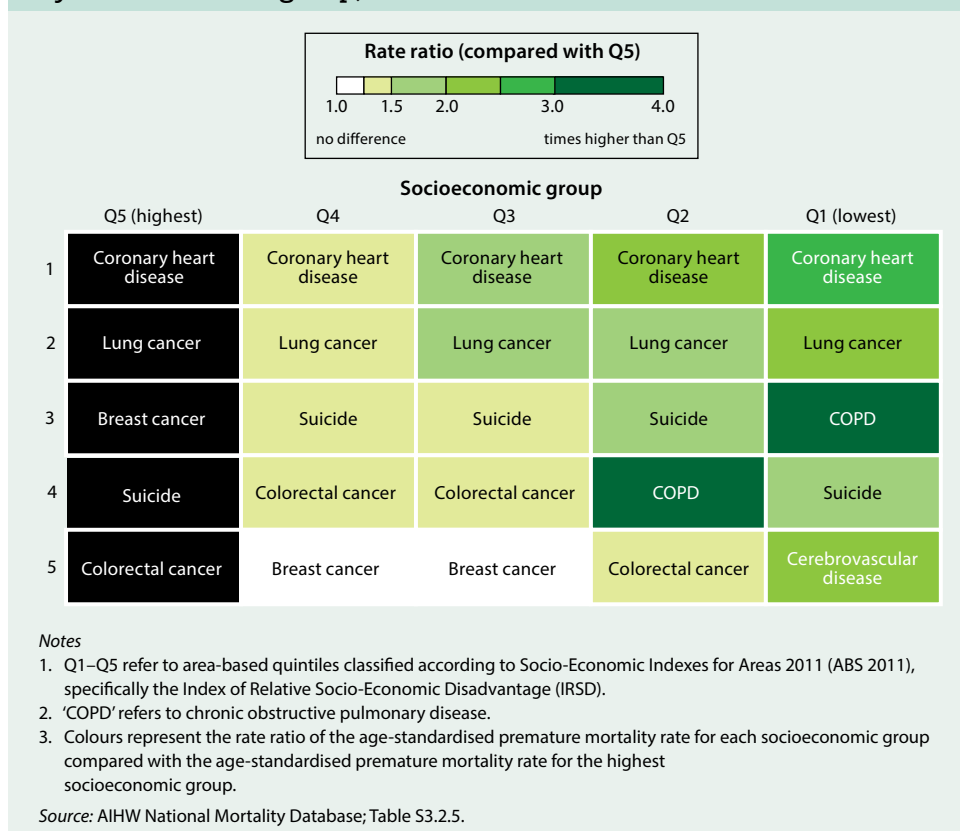
Socioeconomic groups

Socioeconomic factors, including associated disadvantage, are important determinants of health and wellbeing in Australia (see 'Chapter 5.1 Health across socioeconomic groups'). People living in the lowest socioeconomic areas had a premature mortality rate that was 2 times as high as the rate among people living in the highest socioeconomic areas. The effects of a 'social gradient' are also apparent, where each step up the socioeconomic ladder is generally associated with better health and lower levels of risk factors (for details see [Australia's health 2012](#)).

The leading causes of premature death among all five socioeconomic groups were coronary heart disease followed by lung cancer (Figure 3.2.5). For both causes of death, rates increased as disadvantage increased. Of the top five causes of premature death in each socioeconomic group, the largest relative inequality in premature mortality rates was for chronic obstructive pulmonary disease (COPD; 3.8 times as high in the lowest socioeconomic group and 3.0 times as high in the second lowest group as in the highest group).



Figure 3.2.5: Top five leading causes of premature death, by socioeconomic group, 2011–2013



Indigenous Australians

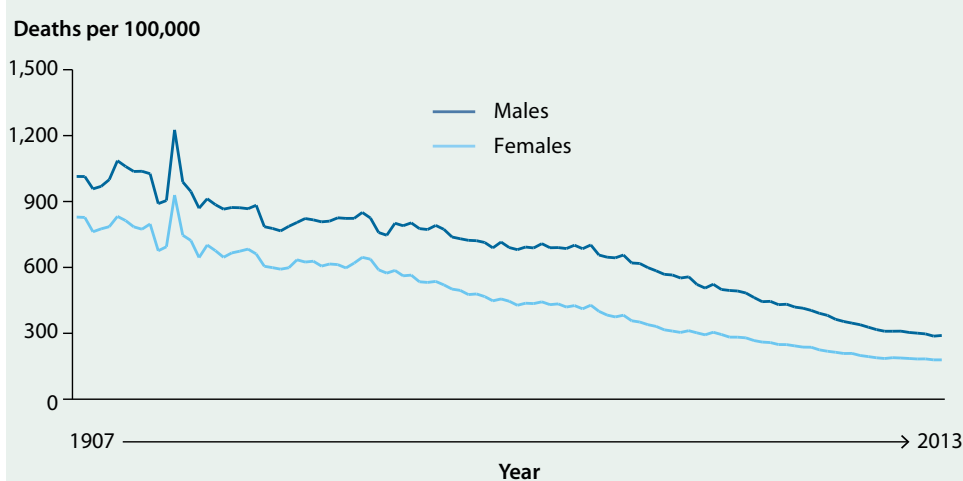
In 2013, there were about 2,600 deaths registered (1.8% of all deaths) for people of Aboriginal or Torres Strait Islander origin in the five jurisdictions for which the quality of Indigenous identification in the data is considered to be adequate—New South Wales, Queensland, Western Australia, South Australia and the Northern Territory. Because Indigenous Australians have a much younger population and have higher death rates at younger ages, a relatively large proportion of Indigenous deaths occur before the age of 75. Around 81% of deaths among Indigenous people occurred before the age of 75, compared with 34% of deaths for non-Indigenous people during the period 2009–2013 (ABS 2015). For more information, see 'Chapter 5.8 Main contributors to the Indigenous life expectancy gap', and the reports [Mortality and life expectancy of Indigenous Australians 2008 to 2012](#) and [The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples: 2015](#).



How have premature death rates changed over time?

Between 1907 and 2013, the premature mortality rate fell by 71% for males and 78% for females (Figure 3.2.6). Deaths of people aged under 75 accounted for 84% of all deaths in 1907 compared with 34% of all deaths in 2013. In 1973, the premature death rate among males was 1.7 times as high as that for females. The gap between males and females fell over the following four decades, and in 2013 the premature death rate for males was 1.6 times as high as that for females.

Figure 3.2.6: Premature mortality rates, by sex, 1907–2013



Source: AIHW 2016; Table S3.2.6.

What has influenced trends in premature deaths?

There has been a long and continuing fall in premature mortality in Australia. The decline in premature deaths in the first half of the last century was associated with factors such as control of infectious disease and better hygiene and nutrition. The decline in the later years was associated with improvements in road safety measures and in the prevention, detection and treatment of disease such as cardiovascular disease and other chronic diseases. Substantial improvements have also occurred through behavioural and policy changes to reduce the effect of 'modifiable' risk factors such as smoking, physical inactivity, poor nutrition and excessive consumption of alcohol.



The following are examples of factors that have influenced trends for some of the leading causes of premature deaths in Australia.



The fall in premature mortality from chronic diseases such as coronary heart disease and cerebrovascular disease has been heavily driven by improvements in reducing risk factors such as high blood pressure (hypertension) and high blood cholesterol (see 'Chapter 4.3 Biomedical risk factors'). There have been marked increases in the use of statins to treat high cholesterol and of anti-hypertensive medication to treat high blood pressure, as well as improvements in rates of smoking and other risk factors.



Chronic obstructive pulmonary disease (COPD) and lung cancer mortality trends in Australia are greatly affected by smoking trends. In 1973, health warnings on cigarette packets were introduced in Australia. In 1976, tobacco smoking advertising on radio and television was banned and, in 1985, anti-smoking commercials began to air on television. Smoking was banned in all pubs and clubs across Australia by 2010—the same year excise and customs duty on cigarettes rose by 25%. Mandatory graphic warnings on packaging of tobacco products about the health effects of smoking were introduced in 2004, followed by mandatory plain packaging of tobacco products in 2012. This range of interventions has influenced smoking rates in Australia and thereby premature death due to diseases related to smoking (see 'Chapter 4.7 Tobacco smoking').



Australia has achieved significant and lasting reductions in land transport deaths as a result of road improvements, safer vehicles, lower speed limits, graduated licensing and a range of programs that target the behaviour of individuals—such as seatbelt laws (applicable across Australia by 1972), random breath testing (first introduced in 1976 in Victoria), and slower default speed limits in urban areas and school zones (progressively implemented across Australia from 1997).



The 'mechanism' or 'means' for suicide deaths differ greatly between subgroups and have changed considerably over time. Some trends can be explained by the availability of certain mechanisms. For example, peaks in premature deaths from poisoning by drugs may be attributable to the availability of certain drugs. Likewise, restrictions to firearm access, introduced in 1996, have been linked to reduced suicides. Organisations that provide information and crisis support, safety measures such as the removal of access to weapons, and the construction of physical barriers (at known 'jump-points'), are likely to have also influenced premature mortality trends.

Services available for people at risk of suicide/intentional self-harm are:

Lifeline 13 11 14 www.lifeline.org.au

Kids Help Line 1800 55 1800 www.kidshelpline.com.au

Suicide Call Back Service 1300 659 467 www.suicidecallbackservice.org.au



What is missing from the picture?

Premature mortality data presented here do not account for quality of life or increasing life expectancy. Burden of disease analyses, however, quantify the effects of disease and injury in terms of 'healthy life' lost due to premature death or disability (see 'Chapter 3.1 Burden of disease and injury in Australia').

Geographic information is reported at aggregated levels in this article (for example, by state and territory, remoteness area and socioeconomic group). Although this is indicative of inequalities, it does not present the full spectrum of mortality inequalities across Australia (for example, between neighbouring suburbs/towns).

Socioeconomic factors such as the highest level of education a person achieves and main occupation are known to be associated with mortality and particular causes of death (AIHW 2014). This information is not collected in Australian deaths data.

There is a lag between some population-level approaches that target key risk factors (for example, tobacco control measures) and the reductions in premature deaths due to related causes (for example, lung cancer and COPD). As such, it is not always possible to directly correlate changes in mortality rates with specific interventions.

Further analysis could be undertaken, such as using linked data, to determine if improvements in premature mortality rates are shared equally across different populations or if particular groups are faring better than others.

Where do I go for more information?

More information on premature mortality, including 15 fact sheets on leading causes of premature mortality and the General Record of Incidence of Mortality (GRIM) books are available on the AIHW website www.aihw.gov.au/deaths.

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