Australian Government
Australian Institute of
Health and Welfare

Premature mortality in Australia 1997–2012

Web report | Last updated: **07 Oct 2015** | Topic: Life expectancy & deaths

About

Premature mortality refers to deaths that occur at a younger age than a selected cut-off. For this report it is deaths that occur in people aged younger than 75.

Cat. no: WEB 87

- Fact sheets
- Data

Findings from this report:

- 1 in 2 premature deaths were considered potentially avoidable
- 1 in 5 deaths among adults aged 25–44 were due to suicide
- 35% decrease in the rate of premature deaths between 1997 and 2012
- 4 in 5 Indigenous deaths (2008–2012) occurred among people under 75

Summary

This web report measures and describes the impact of premature mortality in Australia—that is, deaths among people younger than 75.

In Australia, as in most developed countries, the vast majority of deaths occur at older ages. In general, cancers and chronic diseases such as coronary heart disease are the leading causes of death at older ages, while among younger ages injury and poisoning deaths (external causes of death) such as suicide and accidents are more common. Summary mortality statistics are usually influenced by diseases among the elderly and are less reflective of the patterns of deaths in younger age groups.

These web pages are accompanied by 15 fact sheets and 15 GRIM books on leading causes of premature mortality, including coronary heart disease, lung cancer and suicide. Supplementary data tables and PowerPoint slides are also available.

In 2012, there were 49,692 premature deaths in Australia

Over 1 in 3

deaths (34%) occurred among people younger than 75

Males

accounted for 62% of premature deaths.

1 in 2

premature deaths were considered potentially avoidable.

35%

the decrease in the rate of premature deaths between 1997 and 2012.

4 in 5

Indigenous deaths (2008–2012) occurred among people under 75.

10th

Australia's rank out of 34 OECD countries for lowest premature mortality due to all causes.

Leading causes of premature mortality in 2010–2012 varied by age group

75%

of infant deaths (aged less than 1) were due to conditions originating in the perinatal period and congenital conditions.

Land transport

accidents were the leading cause of death among children aged 1–14.

More than 3 in 4

deaths among young people aged 15–24 were considered potentially avoidable.

1 in 5

deaths among adults aged 25–44 were due to suicide.

Breast cancer

was the leading cause of death among 45–64 year old women and coronary heart disease among 45–64 year old men.

45%

of all premature deaths were among people aged 65–74.

Information in this section was last updated in October 2015.

Overview of premature mortality

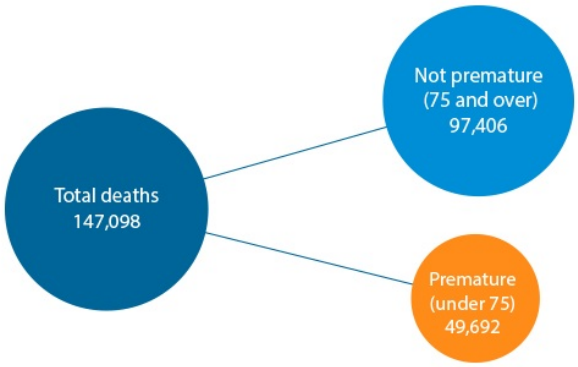
Premature mortality

Premature mortality refers to deaths that occur at a younger age than a selected cut-off. The age below which deaths are considered premature can vary depending on the purpose of the analysis and the population under investigation. Average life expectancy may be used as, or inform, the selected cut-off or an arbitrary age may be set.

For this analysis, deaths among people aged less than 75 are considered premature. This cut-off age produces conservative estimates of premature mortality because it is lower than the current median age at death (81 years in 2012) and life expectancy at birth (80 for males and 84 for females in 2012). This cut-off was chosen to allow for comparisons over time, across population groups and between countries.

Of all deaths in Australia in 2012, over 1 in 3 (34%) occurred among people aged less than 75 (Figure 1.1). That is, there were 49,692 deaths among people aged less than 75 (premature deaths).

Figure 1.1: Premature deaths in Australia, 2012



Source: AIHW National Mortality Database (Table S1, 524KB XLS).

This equates to a rate of 233 premature deaths per 100,000 population aged less than 75 or, put another way, 1 in 429 people aged less than 75 died in 2012. Males accounted for 62% of premature deaths.

Mortality rates in this web report and the accompanying fact sheets represent deaths per 100,000 males/females/persons aged less than 75 (or for each age group reported), unless otherwise stated.

For example, if mortality rates are described for females aged 15–24 as deaths per 100,000 then this refers to deaths per 100,000 females aged 15–24

Potential years of life lost (PYLL)

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.

Other measures of the impact of premature death are used in measuring the fatal burden of disease, which normally uses the term Years of Life Lost (YLL). These are calculated based on a measure of life expectancy at the age of death rather than a particular age cut-off. The third Australian Burden of Disease Study includes such estimates of YLL using a global standard life expectancy. For more information, see Burden of disease.

Using the age of 75 as the cut-off, there were 848,361 PYLL in Australia in 2012. This is equivalent to the social and economic loss from the lifetime contributions of around 10,000 people living to the age of 85. Expressed another way, in 2012 there were 40 PYLL per 1,000 population aged less than 75.

PYLL rates in this web report and the accompanying fact sheets represent PYLL per 1,000 males/females/persons aged less than 75 (or for each age group reported), unless otherwise stated.

For example, if PYLL rates are described for males aged 65–74 as PYLL per 1,000 then this refers to PYLL per 1,000 males aged 65–74.

Potentially avoidable deaths

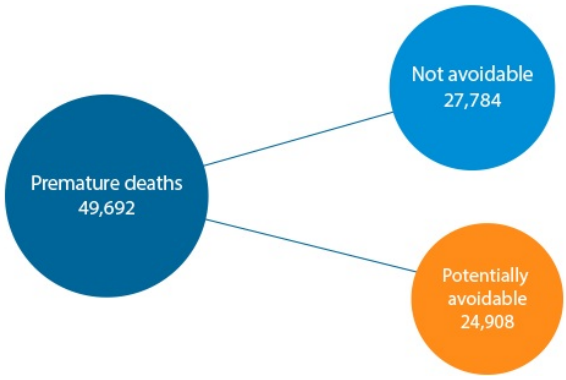
Potentially avoidable deaths are deaths among people younger than 75 that are avoidable in the context of the present health care system. They include deaths from conditions that are potentially preventable through individualised care and/or treatable through existing primary or hospital care. They are a subset of the premature deaths reported here.

Potentially avoidable deaths are classified using nationally agreed definitions (AIHW 2015). The data presented here may differ from previous reports as the nationally agreed revisions to the definition of potentially avoidable deaths in 2014 have been applied.

The definition excludes conditions with limited treatment options and/or poor survival rates after diagnosis (e.g. lung cancer). These conditions are not considered potentially avoidable in the context of the present health care system and have been excluded from measures of potentially avoidable deaths. However, premature mortality from these conditions may be reduced through population health interventions targeting risk factors for these conditions (e.g. anti-smoking campaigns) and therefore they are within scope of this report overall (i.e. premature deaths).

Half (50%) of all premature deaths were considered potentially avoidable (Figure 1.2). That is, there were 24,908 potentially avoidable deaths in Australia in 2012.

Figure 1.2: Potentially avoidable deaths in Australia, 2012



Source: AIHW National Mortality Database (Table S1, 524KB XLS).

This equates to 117 potentially avoidable deaths per 100,000 population aged less than 75 or, put another way, 1 in 855 people aged less than 75 died of a potentially avoidable cause.

Reference

AIHW 2015. National Healthcare Agreement: PI 16-Potentially avoidable deaths, 2015. Viewed 9 June 2015.

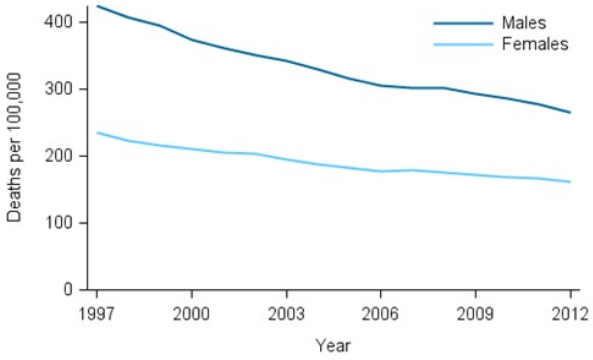
Trends in premature mortality

There were 6,411 fewer premature deaths in 2012 compared with 1997; this equates to a 35% decrease in the age-standardised mortality rate (327 deaths per 100,000 population aged less than 75 in 1997 to 212 per 100,000 in 2012; Figure 2.1).

Some of the major declines in premature mortality have been from causes such as land transport accidents, cerebrovascular disease and colorectal cancer.

Deaths among people aged less than 75 accounted for 43% of all deaths in 1997 compared with 34% of all deaths in 2012.

Figure 2.1: Age-standardised death rates among people aged less than 75, by sex, 1997–2012



Source: AIHW National Mortality Database (Table S1, 524KB XLS).

The rate of PYLLs decreased by 29% from 56 PYLLs per 1,000 population aged less than 75 in 1997 to 40 per 1,000 in 2012.

In 1997, 59% of premature deaths were considered potentially avoidable compared with 50% in 2012.

The age-standardised rate of potentially avoidable deaths decreased by 44% from 193 deaths per 100,000 in 1997 to 108 per 100,000 in 2012.

Causes of premature mortality

Table 3.1 presents the leading causes of premature mortality in Australia in 2010–2012.

Table 3.1: Leading causes of premature death among people aged less than 75, 2010–2012

Rank	Cause of death	Deaths	Per cent	Rate	PYLL	PAD	Per cent premature
1	**Coronary heart disease (I20–I25)**	15,507	10.3	24.7	196,198	YES	24.5
2	**Lung cancer (C33, C34)**	13,350	8.9	21.2	147,349	NO	54.8
3	**Suicide (X60–X84)**	6,798	4.5	10.8	225,477	YES	91.9
4	**Colorectal cancer (C18–C21)**	5,843	3.9	9.3	74,414	YES	47.9
5	**Cerebrovascular disease (I60–I69)**	5,438	3.6	8.6	66,674	YES	16.4
6	**Breast cancer (C50)**	5,278	3.5	8.4	84,014	YES*	61.2
7	**Chronic obstructive pulmonary disease (COPD) (J40–J44)**	5,045	3.4	8.0	43,672	YES	29.3
8	**Cancer, unknown, ill-defined (C26, C39, C76–C80)**	4,330	2.9	6.9	52,492	NO	39.0
9	**Land transport accidents (V01–V89)**	3,804	2.5	6.0	143,227	YES	88.2
10	**Pancreatic cancer (C25)**	3,739	2.5	5.9	43,541	NO	50.7

* Breast cancer deaths are only classified as potentially avoidable among females.

Notes:

1. International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10) codes are presented in parentheses.
2. Per cent is the proportion of all premature deaths that were due to that cause of death.
3. Rates are age-standardised to the 2001 Australian standard population and expressed as deaths per 100,000 population aged less than 75.
4. PYLL (potential years of life lost) are expressed as number of person-years.
5. PAD (potentially avoidable deaths) column indicates whether the cause of death is classified as avoidable (YES) or not avoidable (NO).
6. Per cent premature is the proportion of all deaths due to that cause of death (all ages) that were premature. Note also that injury and poisoning death data should be interpreted with caution due to the potential for revision (see Source data).
7. Colours indicate broad cause of death category.
   blue = chronic disease, orange = cancer, purple = injury & poisoning, green = other cause of death.

Source: AIHW National Mortality Database (Table S2, 524KB XLS).

Leading cause of death grouping

Leading causes of death are grouped in this report as either chronic disease, cancer, injury and poisoning, or other. Chronic disease includes coronary heart disease (I20–I25), cerebrovascular disease (I60–I69), COPD (J40–J44), liver disease and diabetes (K70–K76). Cancer includes all neoplasms (C00–D48). Injury and poisoning includes all external causes of morbidity and mortality (V01–Y98). Other includes all other causes of death.

Chronic disease

The leading cause of premature mortality in 2010–2012 was **coronary heart disease** (10% of deaths among people aged less than 75; Table 3.1). Coronary heart disease is also the leading cause of death in Australia overall, accounting for 14% of deaths across all ages in 2010–2012, with almost 1 in 4 (25%) of these deaths being premature. Although coronary heart disease was also the leading cause of premature death in 1997–1999, the death rate has halved since then—from 54 deaths per 100,000 population aged less than 75 to 25 per 100,000 in 2010–2012.

Other chronic disease causes of premature mortality include **cerebrovascular disease** (e.g. stroke; 3.6%, ranked 5th), **chronic obstructive pulmonary disease** (COPD, 3.4%, ranked 7th), **liver disease** (2.4%, ranked 11th) and **diabetes** (2.4%, ranked 12th).

Rank	Cause (see fact sheets and GRIM books)

1	Coronary heart disease
2	Cerebrovascular disease
3	Chronic obstructive pulmonary disease (COPD)
4	Liver disease
5	Diabetes

Cancer

Lung cancer (8.9%) was the second leading cause of premature mortality in 2010–2012. More than half (55%) of all deaths due to lung cancer were among people aged less than 75. Although lung cancer deaths may be reduced through population health interventions (e.g. anti-smoking campaigns), there are few options for reducing mortality after the condition has developed. Therefore, deaths from lung cancer are not considered potentially avoidable. Lung cancer was the leading cause of death among females aged less than 75 (9.4%).

Other cancers as causes of premature mortality include **colorectal cancer** (3.9%, ranked 4th), **breast cancer** (3.5%, ranked 6th), **melanoma** (1.7%, ranked 17th) and **prostate cancer** (1.6%, ranked 18th). Breast cancer was the second leading cause of death among females aged less than 75 (9.2%) and prostate cancer was the 10th leading cause of death among males aged less than 75 (2.6%).

Rank	Cause (see fact sheets and GRIM books)
1	Lung cancer
2	Colorectal cancer
3	Breast cancer
4	Melanoma
5	Prostate cancer

Injury and poisoning

Suicide (4.5%) was the third leading cause of premature mortality in 2010–2012 and the greatest contributor to PYLLs. Unlike chronic conditions such as coronary heart disease and lung cancer, suicide was a leading cause of death among younger age groups and therefore a greater number of years of life were lost. In 2010–2012, 92% of suicide deaths were among people aged less than 75.

Other causes of premature mortality due to injury and poisoning include **land transport accidents** (2.5%, ranked 9th) and **accidental poisoning** (1.9%, ranked 15th). **Assault** (0.5%, ranked 46th) and **accidental drowning** (0.3%, ranked 57th) were not leading causes of premature mortality among all people aged less than 75, however they were prominent in the younger age groups—assault the 4th leading cause of death in young people aged 15–24 (3.0%) and accidental drowning and submersion the 3rd leading cause of death among children aged 1–14 (6.6%).

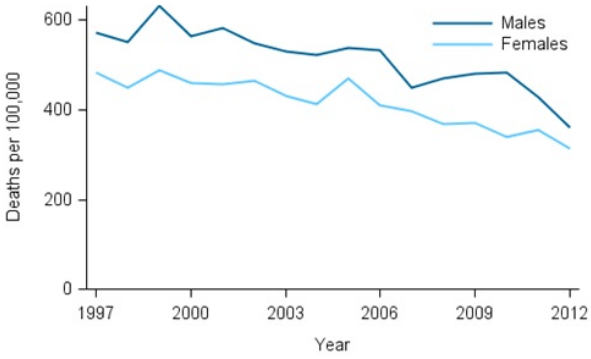
Rank	Cause (see fact sheets and GRIM books)
1	Suicide
2	Land transport accidents
3	Accidental poisoning
4	Assault
5	Accidental drowning

Deaths among infants (aged less than 1)

There were 1,031 infant deaths in Australia in 2012 and just over half (55%) were among males. The rate of infant deaths in 2012 was 338 deaths per 100,000 population aged less than 1 (or about 1 death for every 296 infants). The rate of infant deaths decreased by more than one-third (36%) since 1997; from a rate of 529 deaths per 100,000 (Figure 4.1).

55% of infant deaths in 2012 were considered potentially avoidable, for example those due to complications in the perinatal period.

Figure 4.1: Death rates among infants (aged less than 1), by sex, 1997–2012



Source: AIHW National Mortality Database (Table S1, 524KB XLS).

Three-quarters (75%) of infant deaths in 2010–2012 were due to certain conditions originating in the perinatal period and congenital conditions (Table 4.1). These include, for example, conditions related to short gestation and low birth weight, birth trauma and viral diseases acquired in utero.

Sudden infant death syndrome (SIDS) was the second most common cause of death among infants, accounting for 6.7% of deaths in 2010–2012. Infant deaths due to SIDS have more than halved since 1997–1999, from 58 deaths per 100,000 to 25 deaths per 100,000 in 2010–2012.

Table 4.1: Leading causes of death among infants (aged less than 1), 2010–2012

Rank	Cause of death	Deaths	Per cent
1	**Perinatal & congenital (other)**	2,565	75.4
2	**SIDS (other)**	227	6.7
3	**Ill-defined causes (other)**	144	4.2
4	**Accidental threats to breathing (injury)**	39	1.1
5	**Selected metabolic disorders (other)**	35	1.0

Notes:

1. Colours indicate broad cause of death category.
   blue = chronic disease, orange = cancer, purple = injury & poisoning, green = other cause of death.
2. Injury and poisoning death data should be interpreted with caution due to the potential for revision (see Source data).

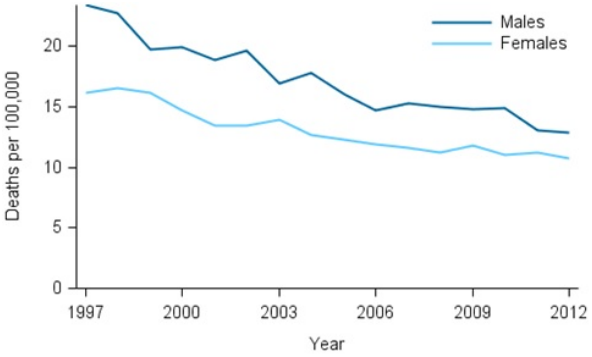
Source: AIHW National Mortality Database (Table S2, 524KB XLS).

Deaths among children aged 1-14

There were 472 deaths among children aged 1–14 in 2012. This age group experienced the lowest mortality rate of any age group in 2012 (12 deaths per 100,000 population aged 1-14 ; or 1 death for every 8,475 children aged 1–14). The death rate among children decreased by 41% since 1997 (from 20 deaths per 100,000; Figure 5.1).

Nearly half (48%) of all child deaths in 2012 were considered potentially avoidable, for example, deaths from land transport accidents.

Figure 5.1: Death rates among children aged 1-14, by sex, 1997-2012



Source: AIHW National Mortality Database (Table S1, 524KB XLS).

Injury and poisoning were among the leading causes of death in this age group: land transport accidents accounted for 14% of child deaths in 2010–2012 and accidental drowning and submersions accounted for 6.6% (Table 5.1).
In 2010–2012, boys accounted for more than two-thirds (65%) of land transport deaths and three-quarters (77%) of drowning deaths in children aged 1–14.

Table 5.1: Leading causes of death among children aged 1-14, 2010-2012

Rank	Cause of death	Deaths	Per cent
1	**Land transport accidents (injury) see fact sheet and GRIM book.**	201	13.8
2	**Perinatal & congenital (other)**	130	8.9
3	**Accidental drowning (injury) see fact sheet and GRIM book.**	97	6.6
4	**Brain cancer (cancer)**	85	5.8
5	**Cerebral palsy & related (other)**	67	4.6

Notes:

1. Colours indicate broad cause of death category.
   blue = chronic disease, orange = cancer, purple = injury & poisoning, green = other cause of death.
2. Injury and poisoning death data should be interpreted with caution due to the potential for revision (see Source data).

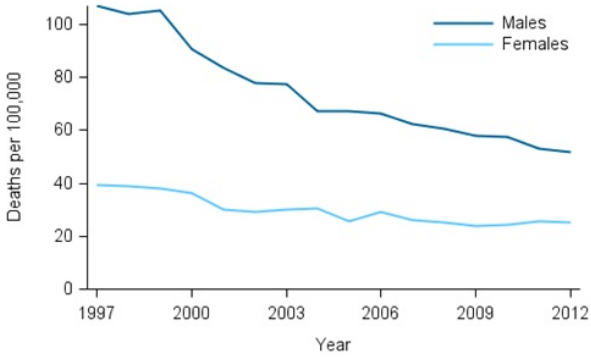
Source: AIHW National Mortality Database (Table S2, 524KB XLS).

Deaths among young people aged 15–24

In 2012, there were 1,203 deaths among young people aged 15–24 of which 820 (68%) were deaths among males. This age group saw the greatest reduction in premature mortality in the last 16 years. The death rate fell by 47%, from 74 deaths per 100,000 population aged 15-24 in 1997 to 39 per 100,000 in 2012 (Figure 6.1).

More than three-quarters (76%) of deaths among young people aged 15–24 were considered potentially avoidable, including all of the top 5 leading causes of death for this age group.

Figure 6.1: Death rates among young people aged 15-24, by sex, 1997-2012



Source: AIHW National Mortality Database (Table S1, 524KB XLS).

The 5 leading causes of death among people aged 15–24 were due to injury and poisoning or due to ill-defined causes (Table 6.1).

Suicide (26%) and land transport accidents (25%) each accounted for about one-quarter of deaths in this age group in 2010–2012.

Land transport accidents were the leading cause of death among males. These accidents were also the leading cause of death in 1997–1999 but the rate has nearly halved since then (from 20 per 100,000 in 1997–1999 to 11 per 100,000 in 2011–12).

The suicide rate for 15–24 year olds has decreased by 39% since 1997–1999, despite being the leading cause of premature death in 2010–2012.

Accidental poisoning was the 3rd leading cause of death in this age group. This category includes drug overdoses.

Assault was the 4th leading cause of death in this age group and 28% of victims of fatal assault were female.

Cause of death information for 2011 and 2012 are subject to further revision. In particular, some of the deaths classified as events of undetermined intent are likely to be re-coded to more specific injury and poisoning causes. This may affect the size of the change in premature mortality rates between 1997–1999 and 2010–2012.

In addition to the revisions process, coding changes were introduced in 2007 to enable deaths to be coded to suicide if evidence indicates the death was from intentional self-harm. This means that in addition to coroner-determined suicides, deaths may also be coded to suicide following further investigation of information on the National Coronial Information System.

For more information, see Source data.

Table 6.1: Leading causes of death among young people aged 15-24, 2010-2012

Rank	Cause of death	Deaths	Per cent
1	**Suicide (injury)** **see fact sheet and GRIM book.**	964	26.2
2	**Land transport accidents (injury)** **see fact sheet and GRIM book.**	933	25.3

3	**Accidental poisoning (injury)** **see fact sheet and GRIM book.**	189	5.1
4	**Assault (injury)** **see fact sheet and GRIM book.**	111	3.0
5	**Event of undetermined intent (injury)**	95	2.6

Notes:

1. Colours indicate broad cause of death category.
   blue = chronic disease, orange = cancer, purple = injury & poisoning, green = other cause of death.
2. Injury and poisoning death data should be interpreted with caution due to the potential for revision (see Source data).

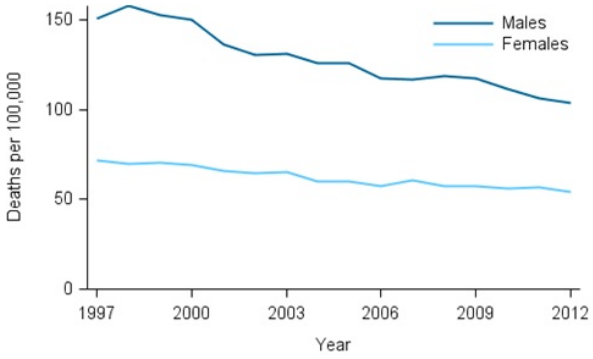
Source: AIHW National Mortality Database (Table S2, 524KB XLS).

Deaths among adults aged 25–44

There were 5,112 deaths among people aged 25–44 in 2012 and this equates to a rate of 79 deaths per 100,000 population aged 25–44, or 1 death per 1,267 people. The death rate decreased by 29% since 1997, from 111 deaths per 100,000 to 79 deaths per 100,000 (Figure 7.1).

More than two-thirds (69%) of deaths in this age group are considered potentially avoidable, including all of the top 5 causes of premature mortality.

Figure 7.1: Death rates among adults aged 25–44, by sex, 1997–2012



Source: AIHW National Mortality Database (Table S1, 524KB XLS).

Suicide was the leading cause of death among people aged 25–44, accounting for 18% of deaths in 2010–2012, followed by accidental poisoning (9.8%) and land transport accidents (8.5%) (Table 7.1).

Coronary heart disease was the 4th leading cause of death among people aged 25–44 (accounting for 5.5% of deaths). More than 4 in 5 deaths due to coronary heart disease in this age group were men.

Breast cancer was the 2nd leading cause of death among women aged 25–44, after suicide, and the 5th leading cause for both sexes combined.

Table 7.1: Leading causes of death among adults aged 25–44, 2010–2012

Rank	Cause of death	Deaths	Per cent
1	**Suicide (injury)** **see fact sheet and GRIM book.**	2,860	18.4
2	**Accidental poisoning (injury)** **see fact sheet and GRIM book.**	1,521	9.8
3	**Land transport accidents (injury)** **see fact sheet and GRIM book.**	1,328	8.5
4	**Chronic heart disease (chronic)** **see fact sheet and GRIM book.**	851	5.5
5	**Breast cancer (cancer)** **see fact sheet and GRIM book.**	472	3.0

Notes:

1. Colours indicate broad cause of death category.
   blue = chronic disease, orange = cancer, purple = injury & poisoning, green = other cause of death.
2. Injury and poisoning death data should be interpreted with caution due to the potential for revision (see Source data).

Source: AIHW National Mortality Database (Table S2, 524KB XLS).

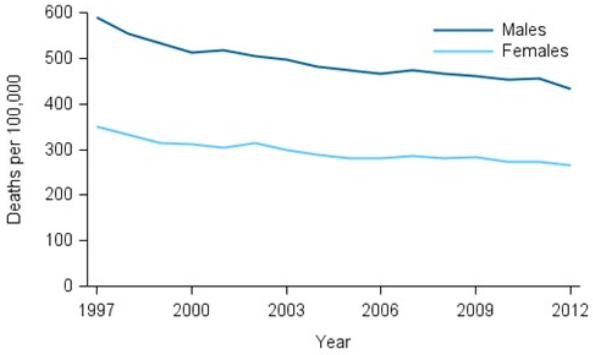
Deaths among adults aged 45-64

Among adults aged 45–64, there were 19,731 deaths in 2012 (or 349 deaths per 100,000 population aged 45–64). Since 1997, there was a 26% decrease in the death rate (from 471 deaths per 100,000 to 349 deaths per 100,000 in 2012).

There was a substantial decline in the mortality rate for coronary heart disease in particular (Figure 8.1).

Fewer than half (48%) of deaths in this age group were considered potentially avoidable.

Figure 8.1: Death rates among adults aged 45-64, by sex, 1997-2012



Source: AIHW National Mortality Database. (Table S1, 524KB XLS).

Chronic diseases such as coronary heart disease, lung cancer, breast cancer and colorectal cancer were the leading causes of death in this age group (Table 8.1).

Suicide was the 5th leading cause of death.

Among men aged 45–64, the leading causes of death were coronary heart disease (15%), lung cancer (8.9%) and suicide (5%).

Among women aged 45–64, the leading causes of death were breast cancer (13%), lung cancer (11%) and coronary heart disease (5.7%).

Table 8.1: Leading causes of death among adults aged 45-64, 2010-2012

Rank	Cause of death	Deaths	Per cent
1	**Coronary heart disease (chronic)** **see fact sheet and GRIM book.**	6,882	11.4
2	**Lung cancer (cancer)** **see fact sheet and GRIM book.**	5,726	9.5
3	**Breast cancer (cancer)** **see fact sheet and GRIM book.**	2,964	4.9
4	**Colorectal cancer (cancer)** **see fact sheet and GRIM book.**	2,688	4.3
5	**Suicide (injury)** **see fact sheet and GRIM book.**	2,420	4.0

Notes:

1. Colours indicate broad cause of death category.
   blue = chronic disease, orange = cancer, purple = injury & poisoning, green = other cause of death.
2. Injury and poisoning death data should be interpreted with caution due to the potential for revision (see Source data).

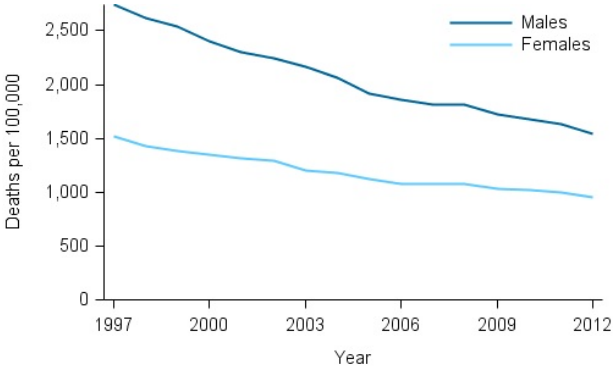
Source: AIHW National Mortality Database (Table S2, 524KB XLS).

Deaths among adults aged 65–74

In 2012, there were 22,143 deaths among people aged 65–74 or 1,245 deaths per 100,000 population aged 65–74. The death rate decreased by 41% since 1997, from 2,101 deaths per 100,000 population to 1,245 deaths per 100,000 population in 2012 (Figure 9.1). Deaths due to coronary heart disease experienced substantial declines over this period of time, despite remaining the leading cause of death.

46% of deaths in this age group were considered potentially avoidable.

Figure 9.1: Death rates among adults aged 65-74, by sex, 1997–2012



Source: AIHW National Mortality Database (Table S1, 524KB XLS).

Coronary heart disease (12%) and lung cancer (11%) each accounted for about 1 in 10 deaths among people aged 65–74 in 2010–2012 (Table 9.1).

The mortality rate for coronary heart disease decreased by about two-thirds (66%) between 1997–1999 and 2010–2012 among 65–74 year olds.

Chronic obstructive pulmonary disease (COPD, 5.3%), cerebrovascular disease (4.6%) and colorectal cancer (4.4%) each accounted for about 1 in 20 deaths among this age group.

Among men aged 65–74, the leading causes of death were coronary heart disease (14%), lung cancer (11%) and COPD (4.8%).

Among women aged 65–74, the leading causes of death were lung cancer (11%), coronary heart disease (8.1%) and breast cancer (7.2%).

Table 9.1: Leading causes of death among adults aged 65–74, 2010–2012

Rank	Cause of death	Deaths	Per cent
1	**Coronary heart disease (chronic)** see fact sheet and GRIM book.	7,755	11.8
2	**Lung cancer (cancer)** see fact sheet and GRIM book.	7,353	11.2
3	**COPD (chronic)** see fact sheetand GRIM book.	3,479	5.3
4	**Cerebrovascular disease (chronic)** see fact sheet and GRIM book.	3,060	4.6
5	**Colorectal cancer (cancer)** see fact sheet and GRIM book.	2,900	4.4

Notes

1. Colours indicate broad cause of death category.
   blue = chronic disease, orange = cancer, purple = injury & poisoning, green = other cause of death.
2. Injury and poisoning death data should be interpreted with caution due to the potential for revision (see Source data).

Source: AIHW National Mortality Database (Table S2, 524KB XLS).

Indigenous premature mortality

In 2012, there were 2,469 deaths registered in Australia for people of Aboriginal or Torres Strait Islander origin, representing 1.8% of all deaths.

Because Indigenous Australians have a much younger population structure and higher death rates at younger ages, a relatively large proportion of Indigenous deaths occur before 'old age'.

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 2008–2012.

Infant deaths (that is, deaths of children aged less than 1 year) represented 4% of Indigenous deaths in 2008–2012, but only 1% of non-Indigenous deaths. The Indigenous death rate for infants was higher than the rate for non-Indigenous infants (6 per 1,000 live births compared with 4 per 1,000 live births).

For both males and females, the Indigenous mortality rate is higher than the non-Indigenous mortality rate for every age group. The mortality rate for Indigenous people aged 35–44 was about 5 times that for non-Indigenous people.

Indigenous potential years of life lost (PYLL)

PYLL rates for the period 2007–2011 suggest that the largest mortality gaps between the Indigenous and non-Indigenous populations are in the 0–4 age group (a rate difference of 376 PYLL per 1,000 population aged 0-4) and the 35–59 years age group (rate differences of between 409 and 517 PYLL per 1,000 for each 5 year age group).

Indigenous potentially avoidable deaths

The rate of potentially avoidable deaths among people younger than 75 was considerably higher for Aboriginal and Torres Strait Islander people than for other Australians in all jurisdictions for which data were available in the period 2008–2012.

In 2008–2012, the age-standardised mortality rate from potentially avoidable deaths was 351 deaths per 100,000 Indigenous population aged less than 75 and 113 per 100,000 other Australians.

Between 2001 and 2012, there was a 9% decline in the all-cause age-standardised mortality rate for Indigenous Australians. This decline in Indigenous mortality rates partly reflects the large declines in Indigenous infant mortality over the last decade.

Trends in Indigenous premature mortality

The largest declines in Indigenous mortality rates between 1998 and 2012 were observed for infants (64% decline), followed by young people aged 15–24 (40%). There was a 33% decline in mortality rate for Indigenous children aged 0–4 years and 5–14 years during the same period.

For non-Indigenous people, the largest declines in mortality rates were observed for young people aged 15–24 (50% between 1998 and 2012). Mortality rates for non-Indigenous children aged 0–4 years and 5–14 years declined by 25% and 35% respectively between 1998 and 2012.

Leading causes of Indigenous premature mortality

The relative contribution of different causes of death varies with age between Indigenous and non-Indigenous populations (Figure 10.1).

For Indigenous infants, 'Conditions originating in the perinatal period' is the main cause of death, followed by 'symptoms, signs and ill-defined conditions' (which includes SIDS) and 'congenital malformations'.

Injury and poisoning account for around half of all deaths of Indigenous children aged 1–14 years.

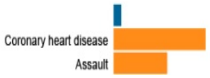
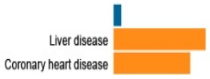
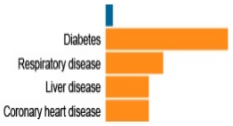
Injury and poisoning deaths (mainly suicide, followed by transport accidents and assault) are also the most common cause of death among Indigenous people aged 15–34, contributing to 66% of deaths.

Among Indigenous people aged 35–44, cardiovascular diseases are the most common cause of death, followed closely by injury and poisoning deaths.

Chronic diseases, such as circulatory diseases (mainly coronary heart diseases), cancer (mainly bowel cancer and lung cancer), and endocrine, metabolic and nutritional disorders (mainly diabetes) are the leading causes of death among Indigenous persons aged 45–64.

Figure 10.1: Rate ratio of Indigenous (orange) and non-Indigenous (blue) age-specific death rates for leading causes of premature mortality, 2009–2013

Compared with their non-Indigenous counterparts...	
Indigenous infants (aged less than 1) were 5 times as likely to die from influenza and pneumonia.	

Indigenous children (aged 1–14) were 4 times as likely to die from land transport accidents.	
Indigenous young people (aged 15–24) were 6 times as likely to die from assault.	
Indigenous adults aged 25–34 were: 12 times as likely to die from coronary heart disease 7 times as likely to die from assault.	
Indigenous adults aged 35–44 were: 12 times as likely to die from liver disease 10 times as likely to die from coronary heart disease.	
Indigenous adults aged 45–54 were: 17 times as likely to die from diabetes 8 times as likely to die from chronic lower respiratory disease 6 times as likely to die from liver disease 6 times as likely to die from coronary heart disease.	
Indigenous adults aged 55–64 were: 16 times as likely to die from diabetes 5 times as likely to die from chronic lower respiratory disease.	

Source: ABS 2015. (Table S6, 524KB XLS)

Further information

ABS 2015. Causes of death, Australia, 2013 (Table 12.4). ABC cat. no. 3303.0. Canberra: ABS.

AIHW 2014. Mortality and life expectancy of Indigenous Australians 2008 to 2012. Cat. no. IHW 140. Canberra: AIHW.

AIHW 2015. The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples 2015. Cat. no. IHW 147. Canberra: AIHW.

SCRGSP (Steering Committee for the Review of Government Service Provision) 2015. Report on Government Services 2015. Canberra: Productivity Commission.

International comparisons of premature mortality

Premature mortality statistics are useful for comparing the health status of different countries. Mortality rates in different countries can be influenced by broad social and economic factors, such as education and income, as well as medical and pharmaceutical advances targeting specific causes of death, and public policy.

The World Health Organization (WHO) and the Organisation for Economic Cooperation and Development (OECD) report on premature mortality. The measures used may differ from those reported within Australia reflecting differences in the populations being compared. For example, both WHO and OECD use the age of 70 (not 75) as the cut-off for premature deaths reflecting that median age at death and life expectancy may be lower in some countries.

There are numerous reports published by national and international organisations that present international comparisons of health. *A working guide to international comparisons of health (PHE 159)* (AIHW 2012) provides a general guide to reporting, interpreting and understanding comparisons.

World Health Organisation (WHO)

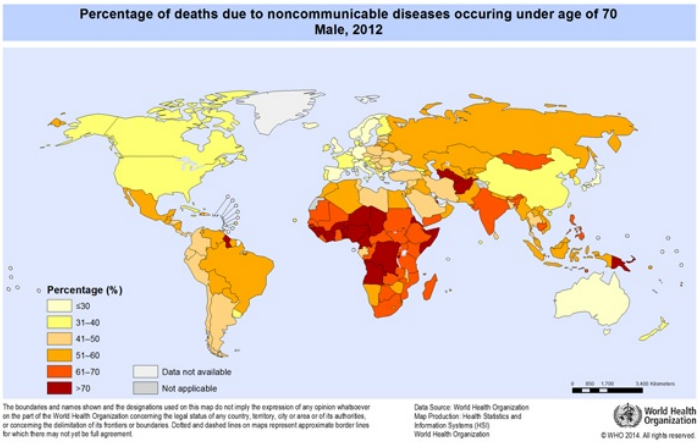
WHO report on premature mortality as the percentage of all non-communicable—or chronic—disease deaths occurring in those aged under 70 (Figure 11.1). Non-communicable diseases are defined by WHO as diseases of long duration and generally slow progression, including cardiovascular diseases, cancer, respiratory diseases and diabetes. Communicable diseases such as lower respiratory infections, HIV/AIDS and diarrhoeal diseases are excluded because they are leading causes of death in low-income countries and may distort comparison with middle and high-income countries.

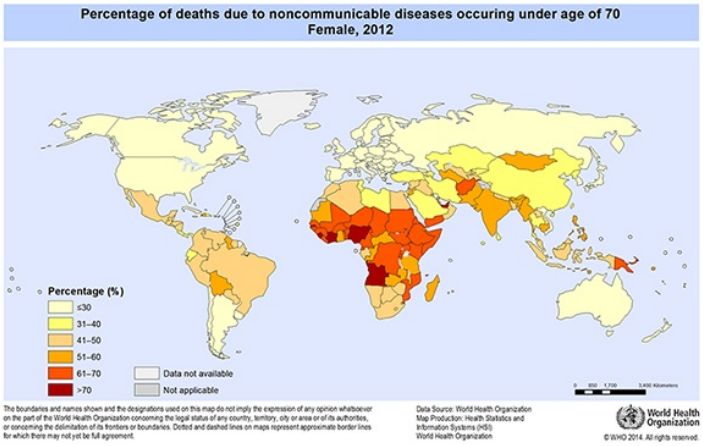
In 2012, 28% of non-communicable deaths among Australian males occurred under the age of 70. Australian males ranked 7th best out of 172 countries for this measure. Australian females had a lower percentage (18%) but were ranked 19th best out of 172 countries.

Italy and Sweden had the lowest proportion (both 23%) of male deaths due to non-communicable diseases occurring under the age of 70. Females living in Italy and Spain experienced the fewest deaths from non-communicable diseases (both 13%).

Males in the United Arab Emirates experienced the highest proportion of deaths from non-communicable diseases before the age of 70 (85%); Sierra Leone had the highest proportion of non-communicable deaths for females (79%).

Figure 11.1: Percentage of deaths due to non-communicable diseases occurring under age 70 by sex, 2012





Source: WHO 2014. (Table S7, 524KB XLS).

Organisation for Economic Cooperation and Development (OECD)

OECD report on premature mortality using the measure of 'potential years of life lost' (PYLL) before the age of 70 years. Most OECD countries have high-income economies and, although each faces different challenges in dealing with specific mortality inequalities, are regarded as developed countries that provide a useful basis for comparison with Australia.

In 2011, Australia was ranked 10th out of 34 OECD countries for lowest premature mortality from all causes (2,764 PYLL per 100,000 population aged less than 70; Table 11.1). Iceland had the lowest rate (2,415 per 100,000) and Mexico had the highest rate (6,782 per 100,000).

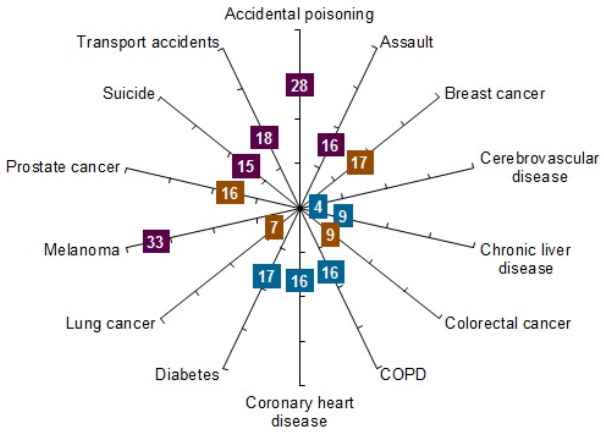
Table 11.1: Potential years of life lost (PYLL per 100,000 population aged less than 70) due to all causes, top 10 OECD countries with lowest PYLL, 2011

Rank	Country	All causes
1	Iceland	2,415.2
2	Sweden	2,419.7
3	Switzerland	2,482.5
4	Italy	2,526.5
5	Israel	2,576.7
6	Luxembourg	2,639.2
7	Spain	2,668.2
8	Netherlands	2,687.0
9	Norway	2,760.2
10	Australia	2,763.7

Source: OECD 2015. (Table S8, 524KB XLS).

Figure 11.2 below shows Australia's OECD ranking for premature mortality due to selected causes of death. The closer to the centre of the web, the worse the country's ranking relative to other OECD countries. Australia was ranked in the top third of OECD countries for lowest premature mortality due to cerebrovascular disease (ranked 4th), lung cancer (7th), colorectal cancer (9th) and chronic liver disease (9th). For accidental poisoning, Australia was ranked 28th out of 34 countries, and for melanoma 33rd (only ahead of New Zealand).

Figure 11.2: Australia's rank out of 34 OECD countries for premature mortality (lowest PYLL) due to selected causes of death, 2011



Source: OECD 2015. (Table S8, 524KB XLS).

Premature mortality in Canada and New Zealand

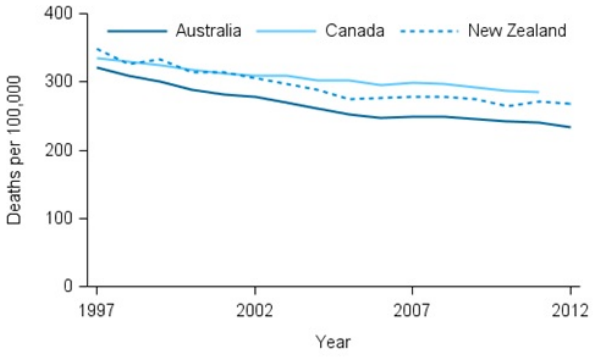
League tables are useful for broad comparisons but they do not shed light on differences between individual countries.

When looking at changes in premature mortality over time, it is helpful to compare Australia with similar countries.

Canada and New Zealand share many similarities with Australia in terms of population characteristics and health status. All 3 countries have heterogeneous populations spread across different geographic areas. Like Australia, Canada and New Zealand both experience inequalities across groups, including people of different cultural and linguistic backgrounds, people living in rural and remote areas and people from lower socioeconomic areas. Aboriginal populations in Canada (First Nations, Inuit and Metis) and Māori populations in New Zealand, like Indigenous populations in Australia (Aboriginal and Torres Strait Islanders), experience poorer health and mortality outcomes compared to the rest of the population. All 3 countries have universal health care arrangements but struggle with the burden of chronic diseases.

Between 1997 and 2011, the rate of premature mortality in Australia decreased by 25% (from 321 deaths per 100,000 population aged less than 75 to 241 per 100,000; Figure 11.3). Over the same time period, the premature mortality rate in Canada decreased by 15% (from 334 per 100,000 in 1997 to 286 per 100,000 in 2011).

Figure 11.3: Premature deaths (crude rate) by country and year, Australia, Canada and New Zealand, 1997–2012

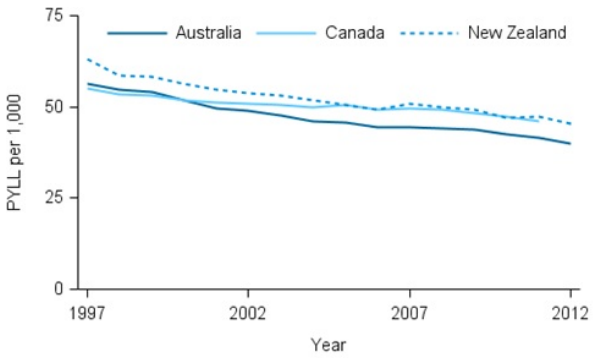


Note: Death rates have not been age-standardised and therefore do not take into account differences in age structure between countries and over time.

Sources: AIHW National Mortality Database; Statistics Canada 2015; Statistics New Zealand 2015. (Table S9, 524KB XLS).

Figure 11.4 shows the trend in PYLL over time in Australia, Canada and New Zealand. As with changes in death rates, the rate of PYLLs decreased by a greater margin in Australia (26%) compared with Canada (17%) and, to a lesser extent, New Zealand (25%). Australia's rate of PYLLs was consistently lower than New Zealand during the 1997–2012 period but was higher than Canada until 2001 (50 PYLL per 1,000 population aged less than 75 in Australia and 51 PYLL per 1,000 in Canada).

Figure 11.4: Potential years of life lost (PYLL) by country and year, Australia, Canada and New Zealand, 1997–2012



Sources: AIHW National Mortality Database; Statistics Canada 2015; Statistics New Zealand 2015. (Table S9, 524KB XLS).

Further information

AIHW 2012. A working guide to international comparisons of health. Cat. no. PHE 159. Canberra: AIHW.

OECD (Organisation of Economic Cooperation and Development) 2015. OECD Health Statistics 2014. Paris: OECD. Viewed 23 June 2015.

Statistics Canada 2015. CANSIM: Table 102-4312 Premature and potentially avoidable mortality . Ottawa: Statistics Canada. Viewed 23 June 2015.

Statistics New Zealand 2015. Infoshare: Deaths by age and sex (Annual-Dec) and Estimated Resident Population by age and sex (Annual-Jun). Wellington: Statistics New Zealand. Viewed 23 June 2015.

WHO (World Health Organisation) 2014. Global Health Observatory. Geneva: WHO. Viewed 22 May 2015.

Premature mortality fact sheets

Premature mortality fact sheets references

1. **Coronary heart disease**

- AIHW (Australian Institute of Health and Welfare) 2014. Trends in coronary heart disease mortality: age groups and populations. Cardiovascular disease series no. 38. Cat. no. CVD 67. Canberra: AIHW.
- AIHW 2015a. Cardiovascular disease, diabetes and chronic kidney disease-Australian facts: risk factors. Cardiovascular, diabetes and chronic kidney disease series no. 4. Cat. no. CDK 004. Canberra: AIHW.
- AIHW 2015b. METeOR (Metadata Online Registry). National Healthcare Agreement: PI 16-Potentially avoidable deaths, 2015. Canberra: AIHW. Viewed 15 April 2015.
- Briffa T, Hickling S, Knuiman M, Hobbs M, Hung J, Sanfilippo FM et al. 2009. Long term survival after evidence based treatment of acute myocardial infarction and revascularisation: follow-up of population based Perth MONICA cohort, 1984-2005. British Medical Journal 338:b36.
- Department of Health 2015. Cardiovascular disease. Canberra: Department of Health. Viewed 15 April 2015.
- Fuster V & Kelly B (eds) 2010. Promoting cardiovascular health in the developing world: a critical challenge to achieve global health. Washington DC: National Academies Press.
- National Heart Foundation of Australia 2015. Cardiovascular conditions. Canberra: Heart Foundation. Viewed 15 June 2015.
- Taylor R, Dobson A & Mirzaei M 2006. Contribution of changes in risk factors to the decline of coronary heart disease mortality in Australia over three decades. European Journal of Cardiovascular Prevention and Rehabilitation 13(5):760-08.
- WHO (World Health Organization) 2008. MPOWER: a policy package to reverse the tobacco epidemic. Geneva: WHO.

2. **Lung cancer**

- ABC News 2014. Key events in anti-tobacco campaign in Australia. Ultimo: ABC. Viewed 15 April 2015.
- ABS (Australian Bureau of Statistics) 2013. Australian Aboriginal and Torres Strait Islander Health Survey: first results, Australia, 2012-13. Cat. no. 4727.0. Canberra: ABS.
- AIHW (Australian Institute of Health and Welfare) 2014. National Drug Strategy Household Survey detailed report: 2013. Drug statistics series no. 28. Cat. no. PHE 183. Canberra: AIHW.
- AIHW 2015a. The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples: 2015. Cat. no. IHW 147. Canberra: AIHW.
- AIHW 2015b. Tobacco smoking in the general population. Canberra: AIHW. Viewed 14 May 2015.
- Doll R & Hill A 1950. Smoking and carcinoma of the lung. British Medical Journal 30:739-48.
- Doll R, Peto R, Wheatley K, Gray R & Sutherland I 1994. Mortality in relation to smoking: 40 years' observations on male British doctors. British Medical Journal 309:901-11.
- Gray, NJ & Hill DJ 1975. Patterns of tobacco smoking in Australia. Medical Journal of Australia 2 (22):819-22.
- Hammond EC 1966. Smoking in relation to the death rates of one million men and women. National Cancer Institute Monograph 19:127-204.
- Intergovernmental Committee on Drugs 2012. National Tobacco Strategy 2012-2018. Canberra: Department of Health and Ageing.
- Magnusson RS & Colagiuri R 2008. The law and chronic disease prevention: possibilities and politics. Medical Journal of Australia 188(2):105-04.
- McLaughlin J, Hrubec Z, Blot W & Fraumeni J 1995. Smoking and cancer mortality among U.S. veterans: a 26-year follow-up. International Journal of Cancer 60:190-03.
- NHMRC (National Health and Medical Research Council) 2004. Clinical practice guidelines for the prevention, diagnosis and management of lung cancer. Sydney: Cancer Council Australia.
- Royal College of Physicians 1962. Smoking and health: summary of a report of the Royal College of Physicians on smoking in relation to cancer of the lung and other diseases. London: Pitman Medical Publishing Co. Ltd.
- Scollo MM & Winstanley MH (eds) 2015. Chapter 13.2: Tobacco taxes in Australia. in Tobacco in Australia 2015. Melbourne: Cancer Council Victoria. Viewed 15 April 2015.
- WHO (World Health Organization) 2014. Raising tax on tobacco: what you need to know. Geneva: WHO.

3. **Suicide**

- AIHW 2015. METeOR (Metadata Online Registry). National Healthcare Agreement: PI 16-Potentially avoidable deaths, 2015. Canberra: AIHW. Viewed 15 April 2015.
- AIHW: Closing the Gap Clearinghouse 2013. Strategies to minimise the incidence of suicide and suicidal behaviour. Resource sheet no. 18. Cat. no. IHW 83. Canberra: AIHW.
- AIHW: Harrison JE & Henley G 2014. Suicide and hospitalised self-harm in Australia: trends and analysis. Injury research and statistics series no. 93. Cat. no. INJCAT 169. Canberra: AIHW.
- AIHW: Harrison JE & Henley G 2015. Injury deaths data, Australia: technical report on issues associated with reporting for reference years 1999-2010. Injury research and statistics series no. 94. Cat. no. INJCAT 170. Canberra: AIHW.
- AIHW: Henley G & Harrison JE 2015. Trends in injury deaths, Australia 1999-00 to 2009-10. Canberra: AIHW.

- AIC (Australian Institute of Criminology) 2012. Firearm trafficking and serious and organised crime gangs: legislative reforms. Griffith ACT: AIC. Viewed 15 May 2015.
- Beyond Blue 2015. Suicide prevention. Hawthorne West, Victoria: Beyond Blue. Viewed 20 April 2015.
- Department of Health 2012. Improving safety at 'hotspots': grant guidelines 2011-2014. Canberra: Department of Health.
- Department of Health 2014. National suicide prevention strategy. Canberra: Department of Health. Viewed 20 April 2015.
- Fleischmann A & Bertolote JM 2003. Suicidal behaviour in a global public health perspective. International Journal of Mental Health 32(1):67-78.
- Headspace 2015. School support: identifying risk factors and warning signs for suicide. Melbourne: Headspace.
- Kleiman EM & Liu RT 2013. Social support as a protective factor in suicide: findings from two nationally representative samples. Journal of Affective Disorders 150(2):540-45.
- Lifeline 2015. Media fast facts. Deakin ACT: Lifeline. Viewed 20 April 2015.
- Melvin GA, Posner K, Stanley BH & Oquendo MA 2015. Management of the suicidal patient. In: Tasman A, Kay J, Lieberman JA, First MB & Riba MB (eds) Psychiatry, 4th edn. Chichester UK: John Wiley & Sons.
- Sarchiapone M, Mandelli L, Iosue M, Andrisano C & Roy A 2011. Controlling access to suicide means. International Journal of Environmental Research and Public Health 8(12):4550-62.
- Senate Community Affairs References Committee 2010. The hidden toll: suicide in Australia. Canberra: Parliament of Australia.
- WHO (World Health Organization) 2006. International Statistical Classification of Diseases and Related Health Problems (ICD-10), second edition. Geneva: WHO.
- WHO 2014. Preventing suicide: a global imperative. Geneva: WHO.
- WHO 2015. Suicide. Viewed 15 May 2015.
- Yip PSF, Caine E, Yousuf S, Chang S-S, Wu KC-C & Chen Y-Y 2012. Means restriction for suicide prevention. Lancet 379(9834):2393-99.

4. **Colorectal cancer**

- AIHW (Australian Institute of Health and Welfare) 2014. Analysis of bowel cancer outcomes for the National Bowel Cancer Screening Program. Cat. no. CAN 87. Canberra: AIHW.
- AIHW 2015a. Bowel cancer (colorectal cancer). Canberra: AIHW. Viewed 29 April 2015.
- AIHW 2015b. METeOR (Metadata Online Registry). National Healthcare Agreement: PI 16-Potentially avoidable deaths, 2015. Canberra: AIHW. Viewed 15 April 2015.
- AIHW 2015c. National Bowel Cancer Screening Program: monitoring report 2013-14. Cancer series no. 94. Cat. no. CAN 92. Canberra: AIHW.
- Ananda SS, McLaughlin SJ, Chen F, Hayes IP, Hunter AA, Skinner IJ et al. 2009. Initial impact of Australia's National Bowel Cancer Screening Program. Medical Journal of Australia 191(7):378-81.
- André T, Boni C, Mounedji-Boudiaf L, Navarro M, Tabernero J, Hickish T et al. 2004. Oxaliplatin, fluorouracil, and leucovorin as adjuvant treatment for colon cancer. New England Journal of Medicine 350(23):2343-51.
- APHDPCSS (Australian Population Health Development Principal Committee Screening Subcommittee) 2008. Population based screening framework. Canberra: Department of Health.
- Bowel Cancer Australia 2014. Bowel cancer: risk factors. North Sydney: Bowel Cancer Australia. Viewed 10 June 2015.
- Chabner DE 2001. The language of medicine. 6th edition. St Louis: WB Saunders Company.
- Department of Health 2014. National bowel cancer screening program. Canberra: Department of Health. Viewed 31 July 2015.
- Sermeus A, Leonard W, Engels B & De Ridder M 2014. Advances in radiotherapy and targeted therapies for rectal cancer. World Journal of Gastroenterology 20(1):1-5.
- Vogelaar I, van Ballegooijen M, Schrag D, Boer R, Winawer S, Habbema J et al. 2006. How much can current interventions reduce colorectal cancer mortality in the U.S.? Mortality projections for scenarios of risk-factor modification, screening, and treatment. Cancer 107(7):1624-33.
- WCRF (World Cancer Research Fund) & AICR (American Institute for Cancer Research) 2011. Continuous update project report. Food, nutrition, physical activity, and the prevention of colorectal cancer. London: World Cancer Research Fund. Viewed 10 August 2015.
- Weitz J, Koch M, Debus J, Hohler T, Galle PR & Buchler MW 2005. Colorectal cancer. Lancet 365 (9454):153-65.

5. **Cerebrovascular disease**

- AIHW (Australian Institute of Health and Welfare) 2013. Stroke and its management in Australia: an update. Cardiovascular disease series no. 37. Cat. no. CVD 61. Canberra: AIHW.
- AIHW 2014. Cardiovascular disease, diabetes and chronic kidney disease: Australian facts mortality. Cardiovascular, diabetes and chronic kidney disease series no. 1. Cat. no. CDK 1. Canberra: AIHW.
- AIHW 2015a. Cardiovascular, diabetes and kidney: Australian facts: risk factors module. Canberra: AIHW.
- AIHW 2015b. METeOR (Metadata Online Registry). National Healthcare Agreement: PI 16-Potentially avoidable deaths, 2015. Canberra: AIHW. Viewed 15 April 2015.
- Department of Health, Western Australia, 2012. WA Health Promotion Strategic Framework 2012-2016. Perth: Chronic Disease Prevention Directorate, Department of Health, Western Australia.
- Lackland DT, Roccella EJ, Deutsch AF, Fornage M, George MG, Howard G et al. 2014. Factors influencing the decline in stroke mortality: a statement from the American Heart Association/American Stroke Association. Stroke 45(1):315-53.
- National Heart Foundation 2010. Guide to management of hypertension 2008. Updated December 2010. Melbourne: National Heart Foundation of Australia.
- National Stroke Foundation 2010. Clinical guidelines for stroke management. Melbourne: National Stroke Foundation.

- National Stroke Foundation 2015. Early treatment after a stroke. Melbourne: National Stroke Foundation. Viewed 24 April 2015.
- NSW Ministry of Health 2013. NSW Healthy eating and active living strategy: preventing overweight and obesity in New South Wales 2013-2018. North Sydney: NSW Ministry of Health
- OECD (Organisation for Economic Co-operation and Development) 2013. Health at a glance 2013: OECD indicators. Paris: OECD Publishing.

6. **Breast cancer**

- AIHW (Australian Institute of Health and Welfare) 2012. Breast cancer in Australia: an overview. Cancer series no. 71. Cat. no. CAN 67. Canberra: AIHW.
- AIHW 2014. Cancer in Australia: an overview 2014. Cancer series no. 90. Cat. no. CAN 88. Canberra: AIHW.
- AIHW 2015. METeOR (Metadata Online Registry). National Healthcare Agreement: PI 16-Potentially avoidable deaths, 2015. Canberra: AIHW. Viewed 15 April 2015.
- AIHW & NBCC (National Breast Cancer Centre) 2007. Breast cancer survival by size and nodal status. Cancer series no. 39. Cat. no. CAN 34. Canberra: AIHW.
- Baade PD, Meng X, Sinclair C & Youl P 2012. Estimating the future burden of cancers preventable by better diet and physical activity in Australia. Medical Journal of Australia 195(5):337-40.
- BreastScreen Australia 2015a. About breast screening. Canberra: Department of Health. Viewed 23 April 2015.
- BreastScreen Australia 2015b. Brochure - BreastScreen Australia Campaign. Canberra: Department of Health. Viewed 23 April 2015.
- Chabner DE 2001. The language of medicine. 6th edition. St Louis: WB Saunders Company.
- Coldman A, Phillips N, Wilson C, Decker K, Chairelli AM, Brisoon J et al. 2014. Pan-Canadian study of mammography screening and mortality from breast cancer. Journal of the National Cancer Institute 106(11).
- Department of Health 2015. Media release: New campaign to boost early breast cancer detection. Canberra: Department of Health. Viewed 23 April 2015.
- NBOCC (National Breast and Ovarian Cancer Centre) 2009. National Breast and Ovarian
- Cancer Centre and Royal Australasian College of Surgeons National Breast Cancer audit. Public Health Monitoring Series 2007 data. Sydney: NBOCC.

7. **Chronic Obstructive Pulmonary Disease (COPD)**

- ABC (Australian Broadcasting Corporation) News 2014. Key events in anti-tobacco campaign in Australia. Sydney: ABC. Viewed 15 April 2015.
- Abramson M, Crockett AJ, Dabsceck E, Frith PA, George J, Glasgow N et al. on behalf of Lung Foundation Australia and the Thoracic Society of Australia and New Zealand 2014. The COPD-X Plan: Australian and New Zealand Guidelines for the management of Chronic Obstructive Pulmonary Disease V2.39.
- Adair T, Hoy D, Dettrick Z & Lopez A 2012. 100 years of mortality due to chronic obstructive pulmonary disease in Australia: the role of tobacco consumption. The International Journal of Tuberculosis and Lung Disease 16(12):1699-705.
- AIHW 2014. National Drug Strategy Household Survey detailed report: 2013. Drug statistics series no. 28. Cat. no. PHE 183. Canberra: AIHW.
- AIHW 2015a. Chronic diseases summary. Canberra: AIHW. Viewed 27 April 2015.
- AIHW 2015b. METeOR (Metadata Online Registry). National Healthcare Agreement: PI 16-Potentially avoidable deaths, 2015. Canberra: AIHW. Viewed 15 April 2015.
- AIHW, Poulos LM, Cooper SJ, Ampon R, Reddel HK and Marks GB 2014. Mortality from asthma and COPD in Australia. Cat. no. ACM 30. Canberra: AIHW.
- Dunt D & Doyle C 2012. Signs of progress in the Australian post-2000 COPD experience, but some old problems remain. International Journal of Chronic Obstructive Pulmonary Disease 7:357-66.
- Intergovernmental Committee on Drugs 2012. National Tobacco Strategy 2012-2018. Canberra: Department of Health and Ageing.
- Magnusson R & Colagiuri R 2008. The law and chronic disease prevention: possibilities and politics. Medical Journal of Australia 188(2):104-05.
- National Asthma Council Australia 2015. Asthma and COPD. South Melbourne: National Asthma Council Australia. Viewed 30 April 2015.
- NHMRC (National Health and Medical Research Council) 2004. Clinical practice guidelines for the prevention, diagnosis and management of lung cancer. Canberra: NHMRC.
- WHO (World Health Organization) 2014. Raising tax on tobacco: what you need to know. Geneva: WHO.
- Zwar N, Marks GB, Hermiz O, Middleton S, Comino EJ, Hasan I et al. 2011. Predictors of accuracy of diagnosis of chronic obstructive pulmonary disease in general practice. Medical Journal of Australia 195(4):168-71.

8. **Land transport accidents**

- ABS (Australian Bureau of Statistics) 2001. Year book Australia 2001. ABS cat. no. 1301.0. Canberra: ABS.
- AIHW (Australian Institute of Health and Welfare) 2015. METeOR (Metadata Online Registry). National Healthcare Agreement: PI 16-Potentially avoidable deaths, 2015. Canberra: AIHW. Viewed 15 April 2015.
- AIHW: Harrison J & Henley G 2015. Injury deaths data, Australia: technical report on issues associated with reporting for reference years 1999-2010. Injury research and statistics series no. 94. Cat. no. INJCAT 170. Canberra: AIHW.
- Australian Centre for Agricultural Health and Safety 2014. Child safety on farms. Moree NSW: Australian Centre for Agricultural Health and Safety. Viewed 7 May 2015.

- ATC (Australian Transport Council) 2011. National Road Safety Strategy 2011-2020. Canberra: Department of Infrastructure and Regional Development.
- BITRE (Bureau of Infrastructure, Transport and Regional Economics) 2010. Effectiveness of measures to reduce road fatality rates. Canberra: Department of Infrastructure and Transport.
- Milne P 1985. Fitting and wearing of seat belts in Australia: the history of a successful countermeasure. Canberra: Department of Transport.
- Transport and Infrastructure Council 2014. National road safety action plan 2015-2017. Canberra: Department of Infrastructure and Regional Development.
- Woolley J 2005. Recent advantages of lower speed limits in Australia. Journal of the Eastern Asia Society for Transportation Studies 6:3562-73.

9. **Liver disease**

- AIHW (Australian Institute of Health and Welfare) 2013. The health of Australia's prisoners 2012: report profile. Cat. no. PHE 171. Canberra: AIHW.
- AIHW 2014. Mortality and life expectancy of Indigenous Australians 2008 to 2012. Cat. no. IHW 140. Canberra: AIHW.
- AIHW 2015. METeOR (Metadata Online Registry). National Healthcare Agreement: PI 16-Potentially avoidable deaths, 2015. Canberra: AIHW. Viewed 15 April 2015.
- Canadian Liver Foundation 2015. Liver disease. Markham Ontario: Canadian Liver Foundation. Viewed 8 May 2015.
- Department of Health 2015a. Alcohol. Canberra: Department of Health. Viewed 8 May 2015.
- Department of Health 2015b. Fourth National Hepatitis C Strategy 2014-2017. Canberra: Department of Health. Viewed 10 July 2015.
- Duggan AE & Duggan JM 2011. Alcoholic liver disease-assessment and management. Australian Family Physician 40(8):590-93.
- Gastroenterological Society of Australia 2015. Liver. Mulgrave Victoria: Gastroenterological Society of Australia. Viewed 7 May 2015.
- Liang W, Chikritzhs T, Pascal R & Binns CW 2011. Mortality rate of alcoholic liver disease and risk of hospitalization for alcoholic liver cirrhosis, alcoholic hepatitis and alcoholic liver failure in Australia between 1993 and 2005. Internal Medicine Journal 41:34-41.
- NHMRC (National Health and Medical Research Council) 2009. Australian guidelines to reduce health risks from drinking alcohol. Canberra: NHMRC.
- O'Brien S, Day C, Black E, Thetford C & Dolan K 2007. Injecting drug users' understanding of Hepatitis C. Sydney: National Drug & Alcohol Research Centre.
- Smart RG & Mann RE 1992. Alcohol and the epidemiology of liver cirrhosis. Alcohol Health & Research World 16(3):217-22.
- Strasser S 2013. Hepatocellular carcinoma: the most rapidly rising cause of cancer death in Australia. Medicine Today 14(12):55-57.

10. **Diabetes**

- AIHW (Australian Institute of Health and Welfare) 2014a. Australia's health 2014. Australia's health series no. 14. Cat. no. AUS 178. Canberra: AIHW.
- AIHW 2014b. Cardiovascular disease, diabetes and chronic kidney disease: Australian facts mortality. Cardiovascular, diabetes and chronic kidney disease series no. 1. Cat. no. CDK 1. Canberra: AIHW.
- AIHW 2014c. Cardiovascular disease, diabetes and chronic kidney disease: Australian facts: prevalence and incidence. Cardiovascular, diabetes and chronic kidney disease series no. 2. Cat. no. CDK 02. Canberra: AIHW.
- AIHW 2015. METeOR (Metadata Online Registry). National Healthcare Agreement: PI 16-Potentially avoidable deaths, 2015. Canberra: AIHW. Viewed 15 April 2015.
- CDC (Centers for Disease Control and Prevention) 2011. Successes and opportunities for population-based prevention and control at a glance 2011. Atlanta: CDC. Viewed 1 September 2015.
- Department of Health 2015. Diabetes. Canberra: Department of Health. Viewed 19 May 2015.
- Knowler W, Barret-Connor E, Fowler S, RF H, JM L & Walker E 2002. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. New England Journal of Medicine 346:393-403.
- Pan XR, Li GW, Hu Y, Wang JX, Yang WY, An ZX et al. 1997. Effects of diet and exercise in preventing NIDDM in people with impaired glucose tolerance. The Da Qing IGT and Diabetes Study. Diabetes Care 20(4):537-44.
- Ramachandran A, Snehalatha C, Mary S, Mukesh B, Bhaskar AD & Vijay V 2006. The Indian Diabetes Prevention Programme shows that lifestyle modification and metformin prevent type 2 diabetes in Asian Indian subjects with impaired glucose tolerance (IDPP-1). Diabetologia 49(2):289-97.
- Tuomilehto J, Lindstrom J, Eriksson JG, Valle TT, Hämäläinen H, Ilanne-Parikka P et al. 2011. The Finnish Diabetes Prevention Study Group: Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. New England Journal of Medicine 344(18):1343-50.
- Twigg SM & Wong J 2015. The imperative to prevent diabetes complications: a broadening spectrum and an increasing burden despite improved outcomes. Medical Journal of Australia 202(6):300-04.
- WHO (World Health Organization) 2015. Diabetes. Fact sheet no. 312. Geneva: WHO. Viewed 1 May 2015.

11. **Accidental poisoning**

- AIHW 2015a. METeOR (Metadata Online Registry). National Healthcare Agreement: PI 16-Potentially avoidable deaths, 2015. Canberra: AIHW. Viewed 15 April 2015.
- AIHW 2015b. Trends in injury deaths, Australia 1999-00 to 2009-10. Canberra: AIHW.
- AIHW: Harrison JE & Henley G 2015. Injury deaths data, Australia: technical report on issues associated with reporting for reference years 1999-2010. Injury research and statistics series no. 94. Cat. no. INJCAT. 170. Canberra: AIHW.

- AIHW: Pointer S 2013. Trends in hospitalised injury, Australia: 1999-00 to 2010-11. Injury research and statistics series 86. Cat. no. INJCAT 162. Canberra: AIHW.
- WHO (World Health Organization) 2015. Poisons. Geneva: WHO. Viewed 4 August 2015.

12. **Melanoma**

- AIHW (Australian Institute of Health and Welfare) 2015. METeOR (Metadata Online). National Healthcare Agreement: PI 16-Potentially avoidable deaths, 2015. Canberra: AIHW. Viewed 15 April 2015.
- Australian Cancer Network Melanoma Guidelines Revision Working Party 2008. Clinical practice guidelines for the management of melanoma in Australia and New Zealand: evidence-based best practice guidelines. Cancer Council Australia and Australian Cancer Network. Cancer Council Australia and Australian Cancer Network, Sydney and New Zealand Guidelines Group, Wellington.
- Cancer Council Australia 2014. Media release: teens tone down tanning 10 years on. Sydney: Cancer Council Australia. Viewed 17 June 2015.
- Cancer Council Australia 2015. Melanoma. Sydney: Cancer Council Australia. Viewed 8 May 2015.
- Cancer Council New South Wales 2014. Commerical solariums (sunbeds) are banned in NSW. 2015. Woolloomooloo: Cancer Council NSW. Viewed 8 May.
- Cancer Institute New South Wales 2015. The dark side of tanning. Eveleigh, NSW: Cancer Institute New South Wales. Viewed 8 May 2015.
- Melanoma Institute Australia 2015. Understanding melanoma. Wollstonecraft NSW: Melanoma Institute Australia. Viewed 8 May 2015.
- Tracey E, Baker D, Chen W, Stavrou E & Bishop J 2007. Cancer in New South Wales: incidence, mortality and prevalence 2005. Sydney: Cancer Institute NSW.

13. **Prostate cancer**

- AIHW (Australian Institute of Health and Welfare) 2013. Prostate cancer in Australia. Cancer series no. 79. Cat. no. CAN 76. Canberra: AIHW.
- AIHW 2015a. Australian Cancer Incidence and Mortality (ACIM) books. Canberra: AIHW.
- AIHW 2015b. METeOR (Metadata Online Registry). National Healthcare Agreement: PI 16-Potentially avoidable deaths, 2015. Canberra: AIHW. Viewed 15 April 2015.
- Alam N, You H, Banks C, Baker D & Bishop J 2009. Prostate cancer in New South Wales. Sydney: Cancer Institute NSW.
- Boyle P & Levin B (eds) 2008. World cancer report 2008. Lyon: International Agency for Research on Cancer.
- Etzioni R, Tsodikov A, Mariotto A, Szabo A, Falcon S, Wegelin J et al. 2008. Quantifying the role of PSA screening in the US prostate cancer mortality decline. Cancer Causes Control 19(2):175-81.
- Feletto E, Bang A, Cole-Clark D, Chalasani V, Rasiah K & Smith DP 2015. An examination of prostate cancer trends in Australia, England, Canada and USA: Is the Australian death rate too high? World Journal of Urology (epublication ahead of printing).
- NHMRC (National Health and Medical Research Council) 2003. Clinical practice guidelines: evidence-based information and recommendations for the management of localised prostate cancer. Canberra: NHMRC.
- NHMRC 2014. PSA testing for prostate cancer in asymptomatic men: information for health practitioners. Canberra: NHMRC.
- Orde MM, Whitaker NJ & Lawson JS 2009. High prevalence of prostatic neoplasia in Australian men. Pathology 41(5):433-35.

14. **Assault**

- AIHW 2015. METeOR (Metadata Online Registry). National Healthcare Agreement: PI 16-Potentially avoidable deaths, 2015. Canberra: AIHW. Viewed 15 April 2015.
- AIHW: Harrison JE & Henley G 2015. Injury deaths data, Australia: technical report on issues associated with reporting for reference years 1999-2010. Injury research and statistics series no. 94. Cat. no. INJCAT 170. Canberra: AIHW.
- AIHW: Henley G & Harrison JE 2015. Trends in injury deaths, Australia 1999-00 to 2009-10. Canberra: AIHW.
- AIC (Australian Institute of Criminology): Bryant & Cussen 2015. Homicide in Australia: 2010-11 to 2011-12: National Homicide Monitoring Program report. AIC Reports. Monitoring Reports 23. Griffith ACT: AIC.
- Department of Social Services 2014. Second Action Plan 2013-2016 - Moving Ahead - of the National Plan to Reduce Violence against Women and their Children 2010-2022. Canberra: Department of Social Services.
- Liem MCA & Pridemore WA (eds) 2012. Handbook of European homicide research: patterns, explanations and country studies. New York: Springer-Verlag.
- WHO (World Health Organization) 2006. International Statistical Classification of Diseases and Related Health Problems (ICD-10), second edition. Geneva: WHO.
- WHO 2010. Violence prevention: the evidence. Geneva: WHO.

15. **Accidental drowning**

- AIHW 2015. METeOR (Metadata Online Registry). National Healthcare Agreement: PI 16-Potentially avoidable deaths, 2015. Canberra: AIHW. Viewed 15 April 2015.
- AIHW: Harrison JE & Henley G 2015. Injury deaths data, Australia: technical report on issues associated with reporting for reference years 1999-2010. Injury research and statistics series no. 94. Cat. no. INJCAT. 170. Canberra: AIHW.
- Australian Water Safety Council 2012. Australian water safety strategy 2012-15: towards a nation free from drowning. Sydney: Australian Water Safety Council.
- Kennedy DM, Sherker S, Brighton B, Weir A & Woodrofe CD 2013. Rocky coast hazards and public safety: moving beyond the beach in coastal risk management. Ocean and Coastal Management 82:85-94.
- Royal Life Saving Society Australia 2014. National drowning report 2014. Royal Life Saving Society Australia.

- Surf Life Saving Australia 2014. National coastal safety report 2014. Sydney: Surf Life Saving Australia.
- Thompson DC & Rivara FP 2000. Pool fencing for preventing drowning in children. Cochrane Database of Systematic Reviews 2000(2):CD001047.
- van Beeck EF, Branche CM, Szpilman D, Modell JH & Bierens JJLM 2005. A new definition of drowning: towards documentation and prevention of a global public health problem. Bulletin of the World Health Organisation 83:853-56.
- WHO (World Health Organization) 2014. Drowning. Geneva: WHO. Fact sheet no. 347. Viewed 8 May 2015.

Technical notes

Abbreviations

ABS	Australian Bureau of Statistics
ACAM	Australian Centre for Airways disease Monitoring
AIDS	acquired immune deficiency syndrome
AIHW	Australian Institute of Health and Welfare
COPD	chronic obstructive pulmonary disease
HIV	human immunodeficiency virus
ICD-10	International Classification of Diseases and Related Health Problems, 10th revision
NISU	National Injury Surveillance Unit
OECD	Organisation of Economic Cooperation and Development
PAD	potentially avoidable deaths
PYLL	potential years of life lost
SCRGSP	Steering Committee for the Review of Government Service Provision
SIDS	sudden infant death syndrome
WHO	World Health Organisation
YLL	years of life lost

Source data

Source data for *Premature mortality in Australia 1997–2012*.

Cause of Death Unit Record File data are provided to the AIHW by the Registries of Births, Deaths and Marriages and the National Coronial Information System (managed by the Victorian Department of Justice) and include cause of death coded by the Australian Bureau of Statistics (ABS). The data are maintained by the AIHW in the National Mortality Database.

Deaths registered in 2010 and earlier are based on the final version of cause of death data; deaths registered in 2011 and 2012 are based on revised and preliminary versions, respectively and are subject to further revision by the ABS. In particular, some of the deaths classified as *event of undetermined intent* are likely to be re-coded by the ABS to more specific causes as more information become available in the National Coronial Information System.

Causes of death presented in this report are based on underlying causes of death. Year refers to year of registration of death. Cause of death information in the National Mortality Database has been coded according to the International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10) since 1997. For comparison over time, most trend analyses presented in this report are restricted to available ICD-10 data (1997–2012).

General Record of Incidence of Mortality (GRIM) books

GRIM books are Excel workbooks that house historical and recent deaths data for specific causes of death in a readily accessible and easy to use format. They refer to different years for different causes of death, depending on the data availability, with some GRIM books starting at 1907. The workbooks present age- and sex-specific counts and rates of deaths along with other summary measures including mean age at death, age-standardised death rates and potential years of life lost.

These workbooks are the only national level electronic source of readily available tabulations of deaths data for deaths registered prior to 1964. Data from 1964 onwards are sourced from the AIHW National Mortality Database.

GRIM books are available for **15 leading causes of premature mortality**: General Record of Incidence Mortality (GRIM) books

Notes

Amendments

27 Jun 2016 - Following feedback, the liver disease fact sheet was updated to change a sentence which said that genetic causes of liver disease were not amenable to primary prevention to instead say that genetic screening could prevent the onset of conditions that cause liver disease.

Acknowledgements

This report was written by Jenna Haddin and Dinesh Indraharan with input from Louise York, Tim Beard, Grant Waraker, Arianne Schlumpp and Jeanette Tyas. It was reviewed by Lisa McGlynn and Jenny Hargreaves from the AIHW.

Subject matter expertise was received from the Cardiovascular Diabetes and Kidney Unit, Cancer and Screening Unit, Mental Health and Palliative Care Unit, Australian Burden of Disease Study, and Indigenous Modelling and Research Unit at the AIHW; and from the Australian Centre for Airways disease Monitoring (ACAM) at the Woolcock Institute of Medical Research, the National Injury Surveillance Unit (NISU) at Flinders University, Dr Paul Clark (University of Queensland), members of the Cancer Monitoring Advisory Group, member of the Diabetes Expert Group and members of the Cardiovascular Disease Expert Advisory Group.

Cause of Death Unit Record File data are provided to the AIHW by the Registries of Births, Deaths and Marriages and the National Coronial Information System (managed by the Victorian Department of Justice) and include cause of death coded by the Australian Bureau of Statistics (ABS). The data are maintained by the AIHW in the National Mortality Database.

Data quality statement

The data quality statements underpinning the AIHW National Mortality Database can be found in the following ABS publications:

- Deaths, Australia (ABS cat. no. 3302.0)
- Causes of death, Australia (ABS cat. no. 3303.0)

Data

Related material

Resources

Formats

Another format | If you need this publication in an alternative format, please contact us.