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**Australian Institute of
Health and Welfare**

Mortality and life expectancy of Indigenous Australians

2008 to 2012



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*Authoritative information and statistics
to promote better health and wellbeing*

Mortality and life expectancy of Indigenous Australians

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Australian Institute of Health and Welfare
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Abbreviations

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
AIHW	Australian Institute of Health and Welfare
AS	age standardised
CDE	Census Data Enhancement
COAG	Council of Australian Governments
COPD	chronic obstructive pulmonary disease
EMD	Enhanced Mortality Database
ICD-10	International Statistical Classification of Diseases and Related Health Problems, 10th revision
NACCHO	National Aboriginal Community Controlled Health Organisation
NAGATSIHID	National Advisory Group on Aboriginal and Torres Strait Islander Health Information and Data
NMD	National Mortality Database
NSW	New South Wales
NT	Northern Territory
PES	Post Enumeration Survey
PYLL	potential years of life lost
Qld	Queensland
SA	South Australia
SIDS	sudden infant death syndrome
Tas	Tasmania
Vic	Victoria
WA	Western Australia

Summary

This report provides an overview of current patterns and trends in mortality and life expectancy among Aboriginal and Torres Strait Islander people.

Indigenous Australians have a life expectancy of around 10 years less than non-Indigenous Australians

In 2010–2012, the estimated life expectancy at birth for Aboriginal and Torres Strait Islander males was 69.1 years, and 73.7 years for females. This was 10.6 and 9.5 years lower than the life expectancy of non-Indigenous males and females respectively.

Indigenous Australians die at younger ages and at higher rates than non-Indigenous Australians

For the period 2008–2012, about two-thirds (65%) of Indigenous deaths occurred before the age of 65, compared with 19% of non-Indigenous deaths.

After adjusting for differences in age structure, Indigenous death rates were 1.6 times as high as non-Indigenous death rates.

Main causes of deaths among Indigenous Australians are circulatory diseases, cancer and external causes

Circulatory diseases were the leading broad cause of Indigenous deaths for the period 2008–2012 (26%), followed by cancer (20%), external causes (15%), endocrine, metabolic and nutritional disorders (9%), respiratory diseases (8%) and digestive diseases (6%).

Chronic diseases are main contributors to the mortality 'gap' between Indigenous and non-Indigenous Australians

Four groups of chronic conditions account for about two-thirds of the gap in mortality between Indigenous and non-Indigenous Australians: circulatory disease (24% of the gap), endocrine, metabolic and nutritional disorders (21%), cancer (12%), and respiratory diseases (12%).

Declines in mortality rates from all causes, circulatory diseases and respiratory diseases

Mortality rates for Indigenous Australians declined by 9% between 2001 and 2012 (in the 5 jurisdictions with adequate data over this period).

Between 2001 and 2012, there were significant declines in Indigenous mortality rates for circulatory diseases for both males and females (declines of 30% and 29% respectively) and for respiratory diseases for Indigenous males (32%). These declines were greater than those observed for the non-Indigenous population.

A widening of the gap in deaths from cancer

While there were improvements in mortality from cancer in the non-Indigenous population between 2001 and 2012, this did not occur in the Indigenous population, leading to a significant increase in the mortality gap due to cancer for both males and females.

1 Introduction

The Australian population experiences death rates amongst the lowest in the world. However, death rates for the Aboriginal and Torres Strait Islander population are much higher than the non-Indigenous population, which is one indicator that the overall health status of Indigenous Australians is worse than that of other Australians. Mortality rates are a useful measure to monitor changes in the overall health status of populations over time.

While there have been some improvements in mortality rates for Aboriginal and Torres Strait Islander people over recent decades, a notable gap between the Indigenous and non-Indigenous population remains. This difference, which is observed across all ages and for major underlying causes of death, results in lower life expectancies for Indigenous Australians. Certain chronic diseases and conditions make larger contributions to Indigenous mortality than they do for non-Indigenous Australians; this affects the mortality gap between the Indigenous and non-Indigenous adult populations.

The Council of Australian Governments (COAG) adopted a target of closing the life expectancy gap between Aboriginal and Torres Strait Islander people and non-Indigenous Australians within a generation. This was 1 of the 6 targets to address Indigenous disadvantage. COAG set a second target of halving the gap in mortality rates for Indigenous children aged less than 5 years within a decade (by 2018) (COAG 2008).

1.1 Content and structure of this report

This report is the second on the topic of mortality and life expectancy in the Indigenous Observatory series of reports. It updates information presented in *Life expectancy and mortality of Aboriginal and Torres Strait Islander people* (AIHW 2011b).

The report provides an overview of current patterns and trends in mortality among Aboriginal and Torres Strait Islander people by examining age, sex and jurisdictional differences as well as highlighting the main causes of death among Indigenous Australians. Comparisons with the non-Indigenous population are presented to outline the gap between the 2 populations and to identify demographic and cause-specific differences in mortality between Indigenous and non-Indigenous Australians.

The following topics are covered in this report:

- life expectancy gap between Indigenous and non-Indigenous people (Section 2)
- overall mortality rates and patterns in Indigenous mortality by age, sex and jurisdictional differences (Section 3)
- the main causes of death among Indigenous Australians (Section 4)
- trends in mortality (Section 5).

1.2 Data sources and methods

Estimates of Indigenous life expectancy presented in this report are derived from the Australian Bureau of Statistics (ABS) Experimental Life Tables (ABS 2013d) (see Box 2.1 for information on the methods used to compute the ABS Experimental Life Tables for the Aboriginal and Torres Strait Islander population).

The measures of all-cause and cause-specific mortality presented in this report are sourced from the AIHW National Mortality Database (NMD), which was last updated on 29 May 2014 (for further information on the NMD, see Appendix A). Due to the small number of Indigenous deaths from some conditions each year, mortality data are presented for the 5-year period 2008–2012 in sections 3 and 4 of this report. Data are reported for 5 jurisdictions – New South Wales (NSW), Queensland (Qld), Western Australia (WA), South Australia (SA) and the Northern Territory (NT). Other jurisdictions have a small number of Indigenous deaths, and identification of Indigenous deaths in their death registration systems is poor, making the data less reliable (see ‘data quality and limitations’ below for further information on the quality of Indigenous mortality data).

Indigenous estimated resident population data are required to compute mortality rates and also estimate life expectancy. The Indigenous population estimates used in this report are estimates and projections based on the 2011 Census (Series B) (ABS 2014).

To account for differences in the age structure of the Indigenous and non-Indigenous populations, this report presents age-specific rates and age-standardised rates throughout. Where age was not stated, deaths were apportioned across age groups.

Appendix B provides information on how these statistics were calculated, and other technical points.

1.3 Data quality and limitations

The main issue with Indigenous mortality estimates is the under-identification of Aboriginal and Torres Strait Islander people in mortality data. It is considered likely that all deaths of Aboriginal and Torres Strait Islander people are registered. However, a proportion of these deaths are not reported as Aboriginal or Torres Strait Islander by the family, health worker or funeral director during the death registration process. The incompleteness of Indigenous identification means the number of deaths recorded as Indigenous results in underestimates of the true levels of mortality.

The ABS and AIHW have both undertaken projects to estimate the true number of Indigenous deaths (see Box 1.1). The level of Indigenous identification in mortality data is shown to vary by age, state and territory, remoteness and over time.

Measuring the size of the Indigenous population is also a problem. The Census count of the number of Aboriginal and Torres Strait Islander Australians has varied considerably over the last two decades. Analysis of the size of the increases between Censuses suggests that these changes are not entirely due to demographic factors such as births and deaths. They are also in part due to changes in the propensity to identify as Aboriginal or Torres Strait Islander. Analyses of recent ABS Census data suggest that there was a particularly large increase in the number of Indigenous people enumerated between the 2006 and 2011 Censuses, which led to a net increase in Indigenous population estimates (ABS 2013a).

While Indigenous life expectancy estimates presented in this report include an adjustment for Indigenous under-identification, mortality data presented have not been adjusted for under-identification. Indigenous mortality rates, and the gap between Indigenous and non-Indigenous Australians, are therefore likely to be underestimated and are associated with a degree of uncertainty. Caution should also be exercised in interpreting the mortality trends presented in this report due to changing identification over time.

Box 1.1: Estimating the true number of Indigenous deaths

ABS Census Data Enhancement Indigenous Mortality Quality Study

The ABS Census Data Enhancement (CDE) Indigenous Mortality Quality Study linked deaths registered from 10 August 2011 to 27 September 2012 with 2011 Census records (ABS 2013a, 2013c). The expected number of Indigenous deaths in the Census was estimated by adjusting linked Indigenous deaths according to propensities of being Aboriginal and Torres Strait Islander in the Post Enumeration Survey (PES) given Indigenous status in the Census. This adjustment was made to ensure that the classification of records as Aboriginal and Torres Strait Islander occurs in a consistent manner in both the population and the deaths data.

Indigenous identification rates were computed by dividing the number of registered deaths reported as Indigenous by the expected number of Indigenous deaths in the Census. The resultant identification rates were used to derive factors for adjusting Indigenous deaths.

Headline adjustment factors for Australia have been calculated using an improved methodology from the previous CDE study undertaken in 2006, which took into account age-specific identification rates. Adjustment factors by state/territory were estimated using a similar method, but without the age-specific adjustment.

Table 1.1 presents the adjustment factors for Australia and for each state and territory. An adjustment factor above 1.0 indicates that a higher number of persons identified as Indigenous at death registration compared with at the Census with PES adjustment.

Table 1.1: Indigenous mortality adjustment factors based on ABS CDE Study 2011–2012

	Disaggregation	Adjustment factor
Headline estimates	0–14 years	1.21
	15–59 years	1.12
	60+ years	1.29
	Australia	1.21
State/territory estimates	NSW	1.42
	Qld	1.24
	WA	1.14
	NT	0.96
	Vic/SA/Tas/ACT combined	2.49
Australia (not age-specific)		1.39

Source: ABS 2013c.

(continued)

Box 1.1 (continued): Estimating the true number of Indigenous deaths

AIHW Enhanced Mortality Database

The AIHW's Enhanced Mortality Database (EMD) project links registered deaths in the National Mortality Database with Indigenous death records from alternative data sources (including residential aged care data, hospital data and neonatal death data). The first phase of the project was completed in 2010, which linked deaths for the period 2001–2006 (AIHW 2012a). The deceased were classified as Indigenous if they were identified as such in any of the sources. The linkage of the additional data sets to the death registration data set identified 10% more deaths than the 10,547 originally recorded on the death registration data set as 'Indigenous'.

The AIHW has since repeated the study using mortality data for the period 2001–2010. Preliminary results for which mortality adjustment factors have been calculated for the period 2008–2010 are currently being reviewed. These are presented in Table 1.2 below.

Table 1.2: Indigenous mortality state/territory specific adjustment factors (preliminary) based on AIHW EMD project (2008–2010)

State/territory	Adjustment factor
NSW	1.21
Vic	1.34
Qld	1.12
WA	1.06
SA	1.13
Tas	1.57
ACT	1.34
NT	1.01
Australia	1.13

Source: AIHW unpublished.

2 Life expectancy

'Life expectancy' is a measure of how long, on average, a person is expected to live if current mortality rates in every age group remained constant throughout a person's life. It is expressed as the number of years of life remaining for a person at a given age, usually at birth (see Box 2.1). Life expectancy is an internationally recognised measure of the health of populations.

Life expectancy is affected by a range of factors including: health behaviours such as smoking; social determinants such as education, income and employment; access to health services; social factors; and environmental factors such as overcrowding and inadequate sanitation (AHMAC 2012).

The data in this section presents estimates of life expectancy at birth for Aboriginal and Torres Strait Islander people published by the Australian Bureau of Statistics and based on the 2011 Census (ABS 2013d).

Box 2.1: Calculating life expectancy

Current life expectancy estimates are based on mortality patterns observed in the population today. The calculation assumes that these death rates will persist throughout the life of someone alive today. For example, the life expectancy for a newborn is based on age-specific death rates in their year of birth.

The ABS calculates life expectancy for the Australian population as a whole and for some subgroups, including Indigenous Australians. These measures are based on 3 years of data to reduce the effect of variations in death rates from year to year.

Life expectancy is calculated using life tables based on deaths data and population estimates. The ABS links death registration records and Census records to estimate the number of deaths that were not correctly identified as Indigenous. This 'direct method', was first used for the 2005–2007 estimates of Aboriginal and Torres Strait Islander life expectancy, which were considered to be more accurate than previous estimates (which were based on an 'indirect method' that required the ABS to make a number of assumptions about the characteristics of the Indigenous population to measure the under-reporting of Indigenous deaths) (AIHW 2011b).

The most recent 2010–2012 estimates are also based on this 'direct method' but with minor refinements. The main improvement made was that the method used to calculate estimates of life expectancy for Indigenous Australians now takes age-specific identification rates into account when calculating the under-identification adjustment. This method could not be used for state and territory life tables due to the insufficient sample from the Post Enumeration Survey to accurately calculate age-specific identification rates. The estimates for New South Wales, Queensland, Western Australia and the Northern Territory were therefore calculated without an age-specific adjustment, and followed the same methodology that was used for the 2005–2007 life tables (ABS 2013d). Due to the different methodologies, life expectancy estimates for these jurisdictions are not comparable with the headline estimates for Australia.

Revised estimates for 2005–2007 have been produced which are consistent with the 2010–2012 figures.

2.1 National life expectancy estimates

In 2010–2012, the estimated life expectancy at birth for Aboriginal and Torres Strait Islander males was 69.1 years, and for females 73.7 years. This was 10.6 years lower than the life expectancy of non-Indigenous males, and 9.5 years lower than that of non-Indigenous females (Figure 2.1).

Estimated life expectancy at birth has increased by 1.6 years for Indigenous males and 0.6 years for Indigenous females between 2005–2007 and 2010–2012. It has also increased by 0.8 years for non-Indigenous males and 0.5 years for non-Indigenous females (Table 2.1). This has resulted in a decline in the life expectancy gap between Indigenous and non-Indigenous Australians of 0.8 years for males, and 0.1 years for females.

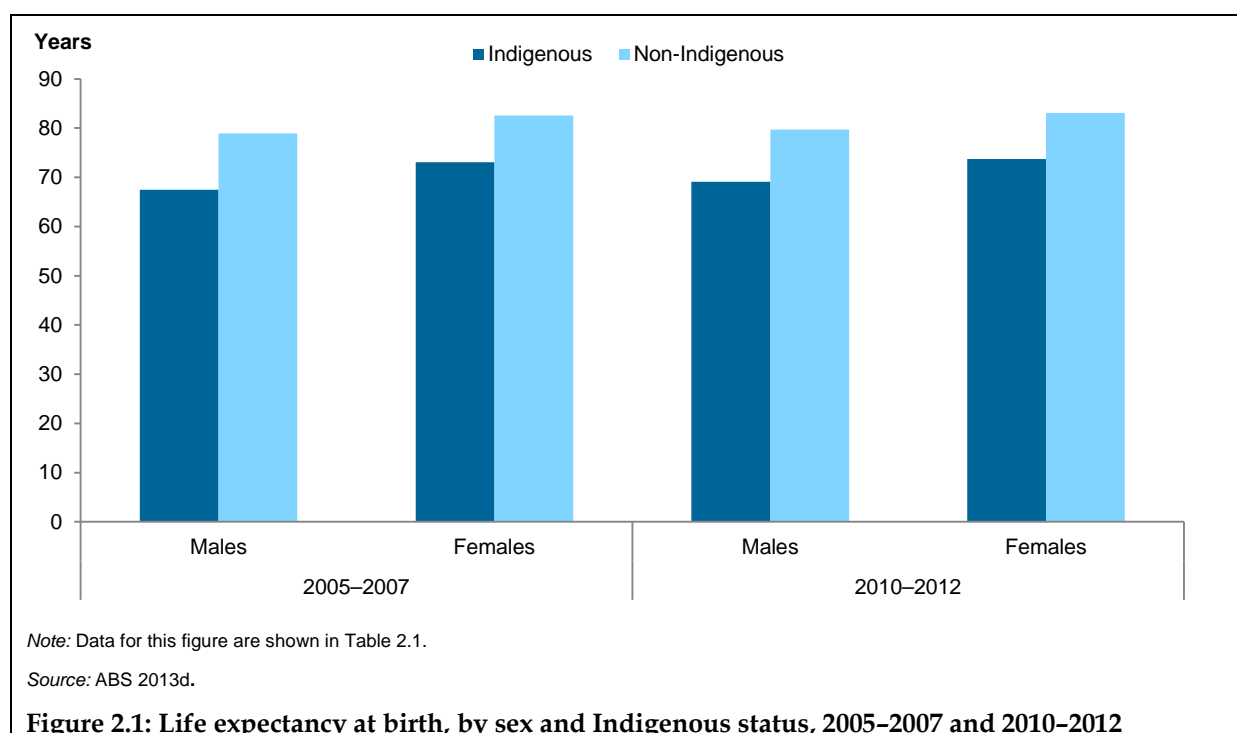


Table 2.1: Life expectancy at birth, by sex and Indigenous status, Australia headline estimates, 2005–2007 and 2010–2012 (years)

	2005–2007 ^(a)			2010–2012		
	Indigenous	Non-Indigenous	Difference (years)	Indigenous	Non-Indigenous	Difference (years)
Males	67.5	78.9	11.4	69.1	79.7	10.6
Females	73.1	82.6	9.6	73.7	83.1	9.5

(a) Revised estimates.

Source: ABS 2013d.

2.2 State/territory life expectancy estimates

In 2010–2012, of the 4 states and territories where the Aboriginal and Torres Strait Islander population is of sufficient size to calculate life expectancy estimates (New South Wales, Queensland, Western Australia and the Northern Territory), the Northern Territory had the

lowest life expectancy for Indigenous males and females (63.4 years and 68.7 years, respectively). New South Wales had the highest life expectancy for Indigenous males (70.5 years) and Indigenous females (74.6 years) (Figure 2.2).

The largest gap in life expectancy between Indigenous and non-Indigenous males was observed in Western Australia (a difference of 15.1 years), while the largest gap for Indigenous females was observed in the Northern Territory (a difference of 14.4 years) (Table 2.2).

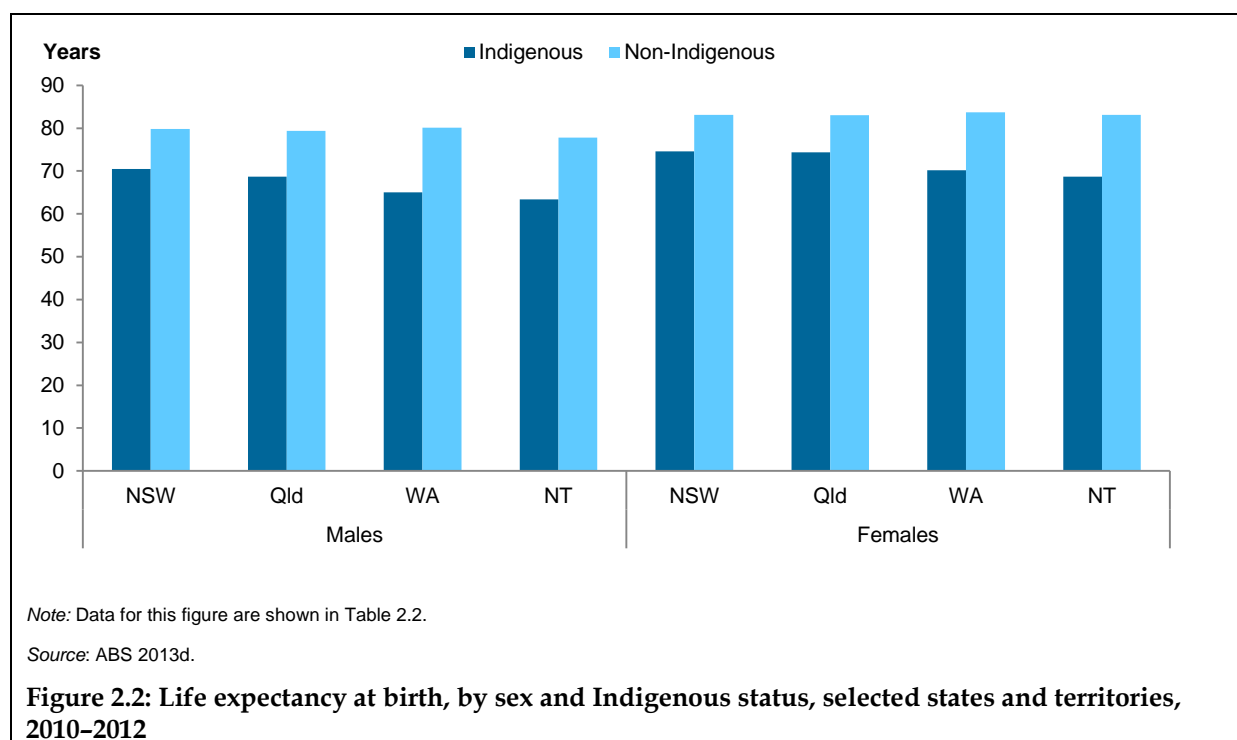


Table 2.2: Estimated life expectancy at birth, by sex and Indigenous status, selected states and territories, 2010-2012 (years)

	Indigenous	Non-Indigenous	Difference
Males			
NSW	70.5	79.8	9.3
Qld	68.7	79.4	10.8
WA	65.0	80.1	15.1
NT	63.4	77.8	14.4
Females			
NSW	74.6	83.1	8.5
Qld	74.4	83.0	8.6
WA	70.2	83.7	13.5
NT	68.7	83.1	14.4

Source: ABS 2013d.

3 All-cause mortality

Mortality rates are an important measure of the health status of a population. Examining trends and patterns in mortality can help explain differences and changes in health status, evaluate health strategies, and guide planning and policy making.

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 (ABS 2013b). Due to the small number of Indigenous deaths from some conditions each year, data are presented for the 5-year period 2008–2012 in sections 3 and 4 of this report. During that period, there were 11,615 deaths registered for Indigenous people in New South Wales, Queensland, Western Australia, South Australia and the Northern Territory combined, representing 2% of all deaths in these jurisdictions.

After adjusting for age differences between the Indigenous and non-Indigenous populations, the mortality rate for Indigenous people during the period 2008–2012 was 1.6 times as high as for non-Indigenous people. Males accounted for just over half (55%) of Indigenous deaths, reflecting higher mortality rates in all age groups.

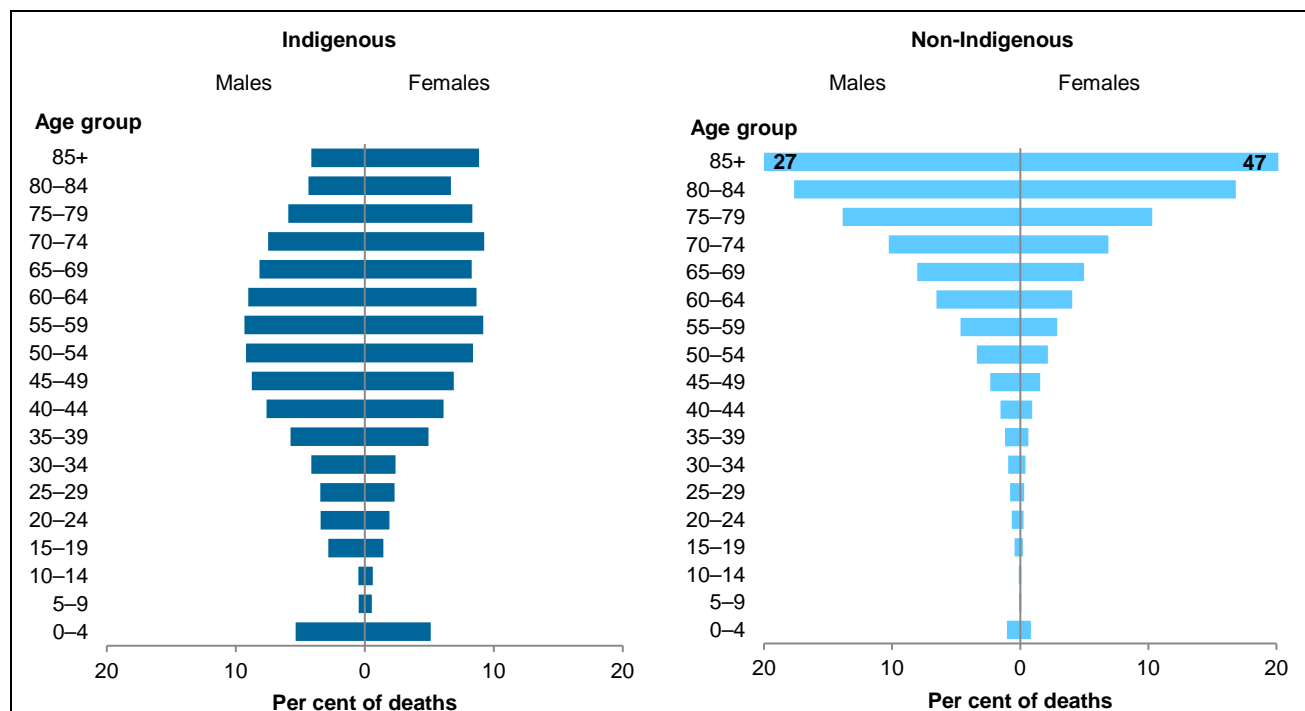
It should be noted that mortality data presented in this chapter have not been adjusted for the under-identification of Indigenous deaths in death registration data and are therefore likely to be under-estimates of the true level of Indigenous mortality (see Appendix A for further information on the quality of Indigenous death registration data).

3.1 Differences by age

The gap in life expectancy reflects differences in the age profile of deaths between the Indigenous and non-Indigenous populations (Figure 3.1). 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 65% of deaths among Indigenous people occurred before the age of 65, compared with 19% 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. Infant mortality and low birthweight are strongly correlated – that is, the lower the birthweight, the higher the risk of a baby dying (Wilcox 2001). Further information on low birthweight among Indigenous babies can be found in *Birthweight of babies born to Indigenous mothers* (AIHW 2014a). See Box 3.1 for further information about infant mortality.

Patterns of causes of death vary significantly between infants and young children. While ‘external’ causes of death (for example, injury and poisoning) make up less than 4% of infant deaths, they account for more than half (53%) of the deaths of Indigenous children aged 1–4 (Figure 4.3 and Appendix Table C4.2).



Notes

1. 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.
2. Data for this figure are shown in Appendix Table C3.1.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Figure 3.1: Age distribution of deaths, by age, sex and Indigenous status, NSW, Qld, WA, SA and NT combined, 2008–2012

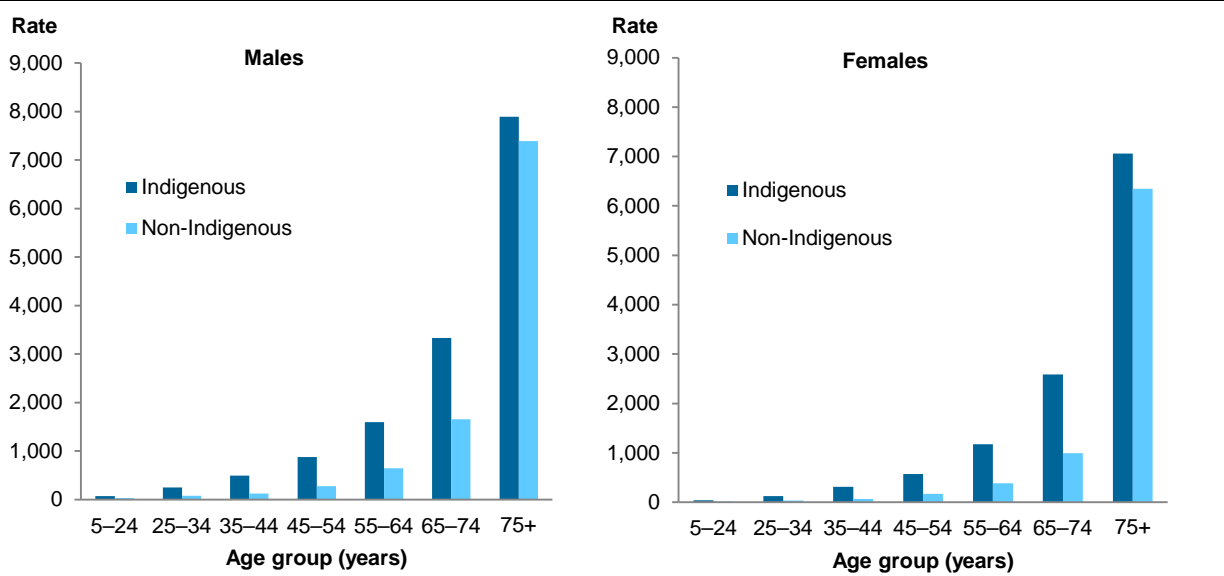
Box 3.1: Infant mortality

Infant mortality includes all deaths of newborns within the first 12 months of life, with the infant mortality rate calculated as the number of such deaths per 1,000 live births. Neonatal deaths (deaths before 28 days of age) account for about 70% of infant mortality across Australia (ABS 2013b).

Over the period 2008–2012, 4,290 infants died in New South Wales, Queensland, Western Australia, South Australia and the Northern Territory combined. Just over 1 in 10 (11%) of these were Indigenous infants (that is, infants of Indigenous fathers and/or mothers). 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).

The most common cause of death of Indigenous infants was ‘conditions originating in the perinatal period’ (such as birth trauma; disorders related to foetal growth; and complications of pregnancy, labour and delivery), accounting for 48% of deaths in 2008–2012 (3.0 per 1,000 live births). About 1 in 7 (15%) Indigenous infant deaths were due to ‘congenital malformations, deformations and chromosomal abnormalities’, while deaths classified as ‘symptoms, signs and abnormal findings not elsewhere classified’ – which mainly includes sudden infant death syndrome (SIDS) – accounted for 20% of these deaths (Appendix Table C4.2).

Age-specific mortality rates for the period 2008–2012 are shown in Figure 3.2. 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 4 times that for non-Indigenous people.



Notes

- 1. 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.
- 2. Data for this figure are shown in Appendix Table C3.2.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Figure 3.2: Age-specific mortality rates, by sex and Indigenous status, NSW, Qld, WA, SA and NT combined, 2008–2012 (deaths per 100,000 population)

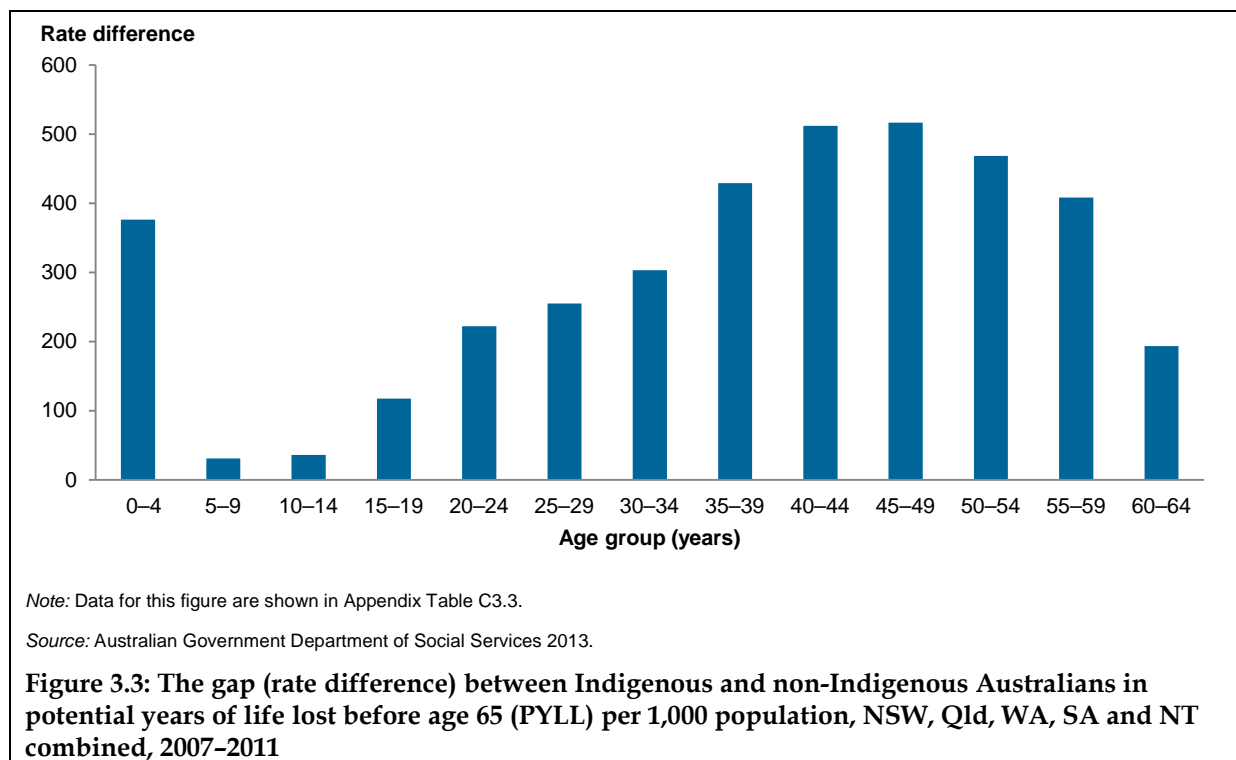
Another measure of differences in mortality by age is potential years of life lost (PYLL) which gives greater weight to deaths in younger age groups (see Box 3.2).

Box 3.2: Potential years of life lost as a measure of age differentials in mortality

Potential years of life lost is an estimate of the number of additional years a person would have lived had they not died before a certain age, such as 65 years (for example, if a person dies at age 45 then this person would have lost 20 years of potential life). Consequently, PYLL gives greater weight to deaths in younger age groups.

The impact these early deaths have at the population level can be measured by the PYLL rate per 1,000 population, which totals all the potential years of life lost for all the deaths at each age group, divided by the number of people in that age group.

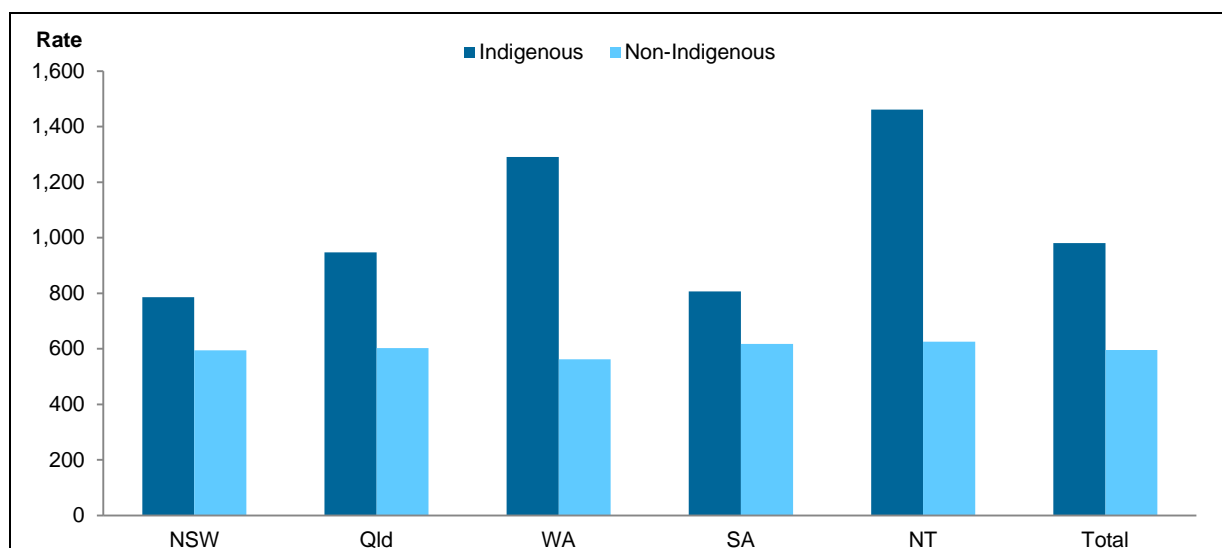
PYLL rates for the period 2007–2011 suggest that the largest mortality gaps between the Indigenous and non-Indigenous populations are in the 0–4 age group (a rate difference of 376 PYLL per 1,000 population) and the middle years (35–59 years) (rate differences of between 409 and 517 PYLL per 1,000) (see Figure 3.3).



3.2 Differences by state and territory

Of the 5 states and territories for which Indigenous mortality data are of sufficient quality to report (see Appendix A for more information), the highest age-standardised mortality rates for the Indigenous population during the period 2008–2012 were observed in the Northern Territory (1,461 per 100,000 population), followed by Western Australia (1,291 per 100,000 population). Mortality rates for the non-Indigenous population were also highest in the Northern Territory (625 per 100,000 population) (Table 3.1; Figure 3.4).

When taking into account population size and age structure, Indigenous mortality rates were significantly higher than non-Indigenous mortality rates in all 5 jurisdictions reported. Indigenous Australians died at more than twice the rate of non-Indigenous Australians in Western Australia and the Northern Territory. These 2 jurisdictions also had the largest rate differences in mortality between Indigenous and non-Indigenous Australians (Table 3.1).



Notes

1. 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.
2. Data for this figure are shown in Table 3.1.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Figure 3.4: Age-standardised death rates, by jurisdiction and Indigenous status, NSW, Qld, WA, SA and NT, 2008–2012 (deaths per 100,000 population)

Table 3.1: Mortality, by jurisdiction and Indigenous status, NSW, Qld, WA, SA and NT, 2008–2012

Jurisdiction	Number of deaths			Age-standardised death rate ^(a) (deaths per 100,000)			
	Indigenous	Non-Indigenous	Not stated	Indigenous	Non-Indigenous	Rate ratio ^(b)	Rate difference ^(c)
NSW	3,133	238,619	1,913	786.4	594.4	1.3	192.0
Qld	3,160	130,304	2,814	947.9	603.1	1.6	344.9
WA	740	62,893	252	1,290.6	562.8	2.3	727.7
SA	2,262	61,323	521	807.1	617.7	1.3	189.4
NT	2,320	2,640	16	1,461.0	625.4	2.3	835.7
Total	11,615	495,779	5,517	981.1	595.6	1.6	385.5

(a) Rates are directly age-standardised using the 2001 Australian estimated resident population (based on the 2001 Census), by 5-year age group to 75+ (see Appendix B).

(b) Rate ratio is the age-standardised Indigenous rate divided by the age-standardised non-Indigenous rate.

(c) Rate difference is the age-standardised Indigenous rate minus the age-standardised non-Indigenous rate.

Note: 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Care should be taken when comparing mortality rates across states and territories, and over time, due to jurisdictional differences in the level of Indigenous under-identification in death registrations data (ABS 2013d) (see Box 1.1 for state and territory Indigenous under-identification adjustment factors for 2010–12 from the ABS Census Data Enhancement Indigenous Mortality Quality Study and for 2008–2010 from the AIHW Enhanced Mortality Database project).

4 Causes of death

Examining the causes of death in Australia, and of Indigenous people specifically, provides further insight into the events contributing to deaths and the burden of disease. Changes in the pattern of causes of death may reflect changes in behaviours, exposures, health interventions, social and environmental circumstances and the effects of medical and technological advances (AIHW 2012b). Information about the major conditions that cause death can help in developing and monitoring policies and programs.

This chapter presents information on the leading underlying causes of death for broad disease groupings (ICD-10 chapter level – see Box 4.1) as well as for more specific causes of death of relevance to the Indigenous population in New South Wales, Queensland, Western Australia, South Australia and the Northern Territory combined.

Box 4.1: Classifying causes of death

Leading underlying causes of death are determined by grouping specific causes of death and counting the number of deaths assigned to each disease group. Over 14,000 specific causes of illness, injury and death are presented in the *International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10)* (WHO 2014). These specific causes are often grouped in a way that is meaningful for public health purposes.

A common grouping is by ICD chapters which are broad categories arranged according to the type of disease, the body system affected by the disease, or the circumstances causing death. Each chapter is further divided into blocks of related diseases.

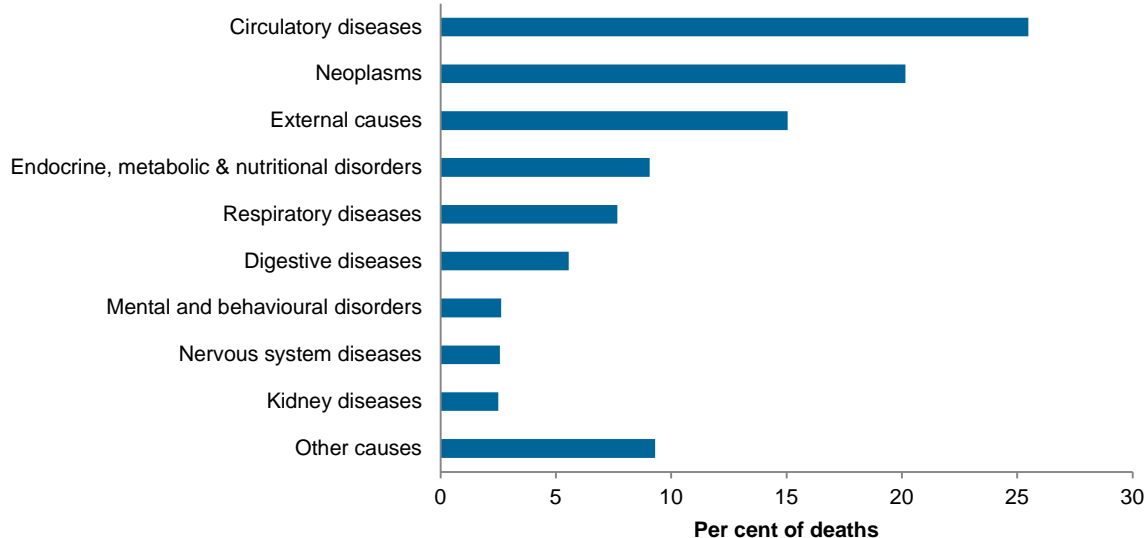
For leading underlying cause of death analysis, information often needs to be more specific than ICD chapters and blocks. There is no standard method for grouping causes; however, the AIHW follows the recommendations of the World Health Organization (Becker et al. 2006) with minor modifications to suit the Australian context. This grouping is a mix of ICD chapters, blocks and specific diseases to maximise information, separate out ill-defined causes and highlight health priority areas.

4.1 What do Indigenous Australians die from?

The most common broad cause of death reported among Indigenous people during the period 2008–2012 was circulatory diseases (26% of total deaths), followed by cancer (20%), external causes (including transport accidents, suicide and assault) (15%), endocrine, metabolic and nutritional disorders (including diabetes) (9%), respiratory diseases (8%) and digestive diseases (6%) (Figure 4.1). These 6 groups of diseases accounted for 83% of deaths of Indigenous Australians.

Indigenous people died from circulatory diseases at a crude rate of 102 deaths per 100,000 population, from neoplasms (cancer) at 81 per 100,000 and from external causes at 60 per 100,000 population during the period 2008–2012.

Kidney diseases accounted for 2.5% of all deaths of Indigenous Australians. However, this is likely to be an underestimate of the contribution of kidney diseases to overall mortality as deaths involving chronic kidney diseases are often listed as an ‘associated’ cause of death rather than the underlying cause of death for which these statistics are based on.



Notes

1. 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.
2. Data for this figure are shown in Appendix Table C4.1.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Figure 4.1: Broad causes of death among Indigenous people, NSW, Qld, WA, SA and NT combined, 2008–2012

Analysis of specific causes of death for males and females gives a better picture of the specific contributors to Indigenous mortality. The top 10 specific causes of death for Indigenous males and females are presented in Table 4.1. These were responsible for just over half of Indigenous deaths in 2008–2012.

Table 4.1: Leading specific causes of death, by sex, Indigenous Australians, NSW, Qld, WA, SA and NT combined, 2008–2012

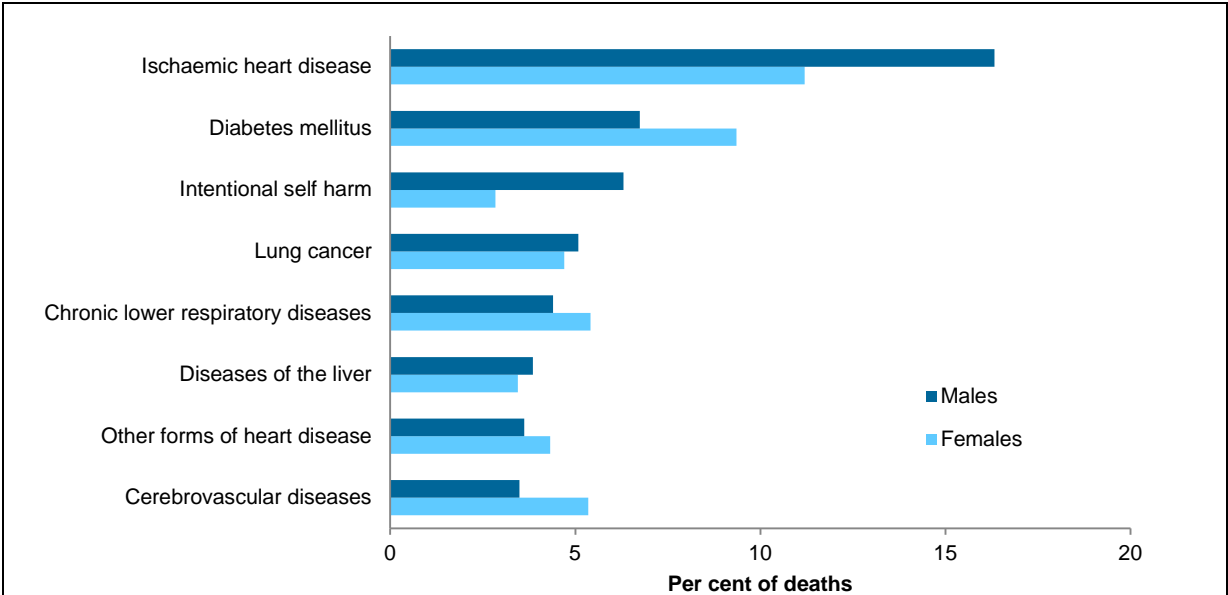
Rank	Indigenous males		Indigenous females	
	Specific underlying cause of death ^(a)	Per cent	Specific underlying cause of death ^(a)	Per cent
1	Ischaemic heart disease	16.3	Ischaemic heart disease	11.2
2	Diabetes mellitus	6.7	Diabetes mellitus	9.4
3	Intentional self-harm	6.3	Chronic lower respiratory diseases	5.4
4	Lung cancer	5.1	Cerebrovascular diseases	5.4
5	Chronic lower respiratory diseases	4.4	Lung cancer	4.7
6	Diseases of the liver	3.9	Other forms of heart disease	4.3
7	Other forms of heart disease	3.6	Diseases of the liver	3.4
8	Cerebrovascular diseases	3.5	Breast cancer	2.9
9	Car occupant injured in transport	2.7	Intentional self-harm	2.8
10	Accidental poisoning by and exposure to noxious substances	1.9	Kidney failure	2.7

(a) For the list of ICD-10 codes that were used for this table, see Appendix Table B1.1.

Note: 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Coronary heart diseases (also known as ischaemic heart disease) were the leading specific cause of death in both sexes and accounted for 16% of Indigenous male deaths and 11% of Indigenous female deaths (Figure 4.2).



Notes

1. 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.
2. Data for this figure are shown in Table 4.1.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Figure 4.2: Leading specific causes of death, by sex, Indigenous Australians, NSW, Qld, WA, SA & NT combined, 2008–2012

Diabetes was the second leading cause of death for both sexes and accounted for 7% and 9% of Indigenous male and female deaths respectively.

Suicide (intentional self-harm) was the third leading cause of death among Indigenous males (6%), followed by lung cancer (5%). In contrast, chronic lower respiratory diseases (notably chronic obstructive pulmonary disease – COPD) and cerebrovascular diseases (notably stroke) were the third and fourth leading causes of death among Indigenous females (both 5%).

Coronary heart diseases and COPD are the topic of another report in the Indigenous Observatory series entitled *Coronary heart disease and chronic obstructive pulmonary disease in Indigenous Australians* (AIHW 2014b).

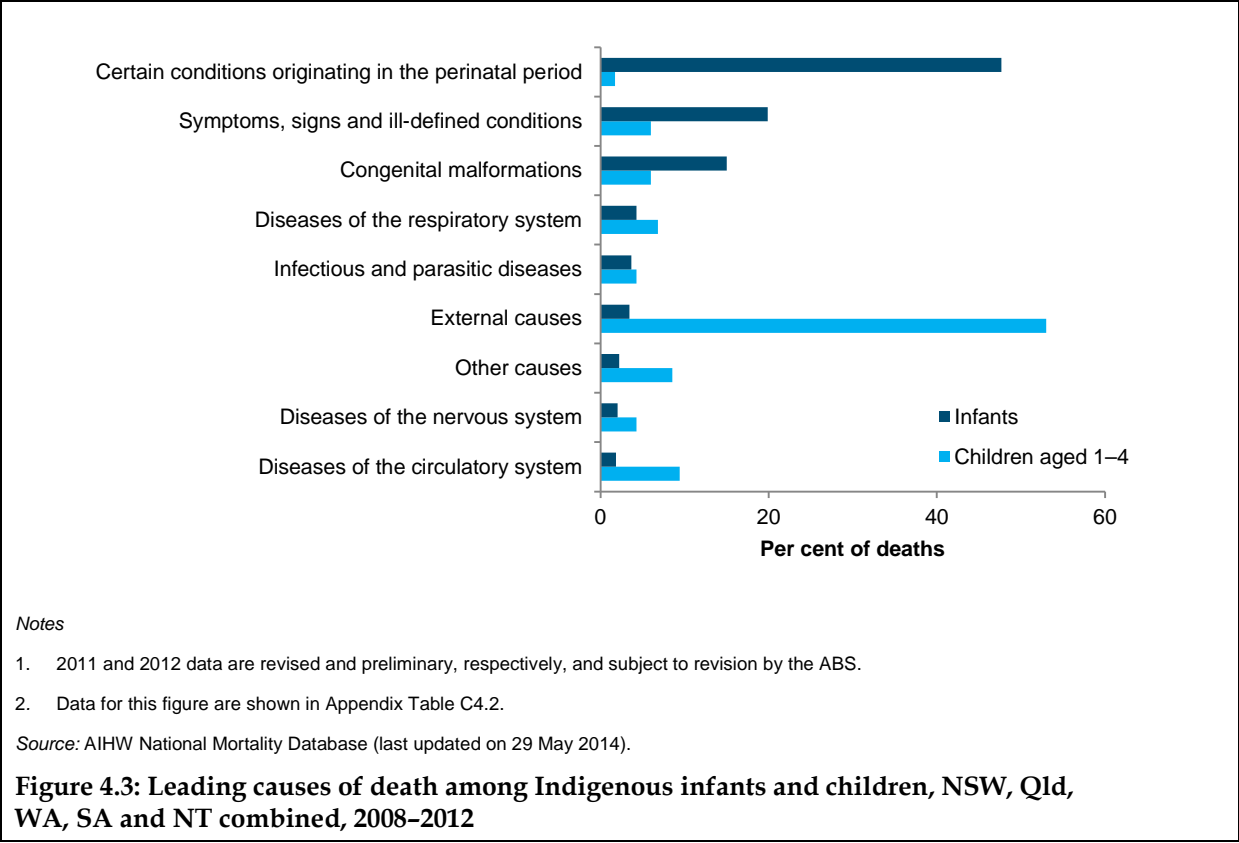
Diseases of the liver and other forms of heart disease were among the top 10 leading causes of death for both sexes. Transport accidents featured among the top 10 causes of death for Indigenous males only, and breast cancer and kidney failure featured among the top 10 causes of death for Indigenous females.

Causes of death by life stage

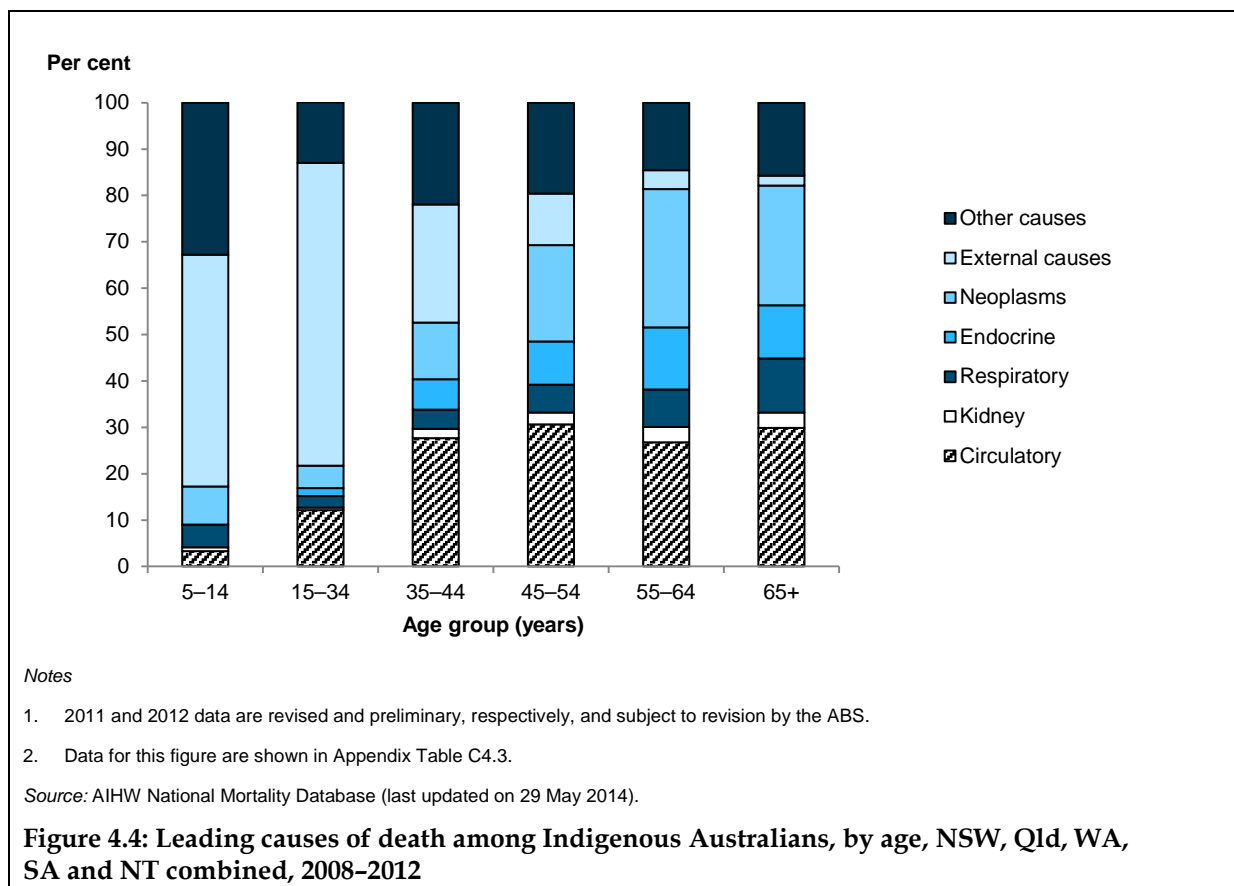
The relative contribution of different underlying causes of death varies with age. The changes in leading causes of death as age increases reflect both longer exposure to various

environmental factors and other risk factors (both modifiable and non-modifiable) and the underlying ageing processes (AIHW 2010).

‘Conditions originating in the perinatal period’ dominate the infant mortality statistics, followed by ‘symptoms, signs and ill-defined conditions’ (which includes SIDS) and ‘congenital malformations’. External causes (injury and poisoning) account for around half of all deaths of children aged 1–4 years (Figure 4.3).



External causes (mainly injury) are the most common cause of death among Indigenous children aged 5–14 and account for half of the deaths in that age group. External causes (mainly suicide, followed by transport accidents and assault) are also the most common cause of death among Indigenous people aged 15–34, contributing to 65% of 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 the middle aged (persons aged 45–64) (Figure 4.4). Respiratory diseases are significant contributors to death among those at older ages. Prominent among these is COPD, a leading specific contributor to deaths overall.



4.2 Comparisons with the non-Indigenous population

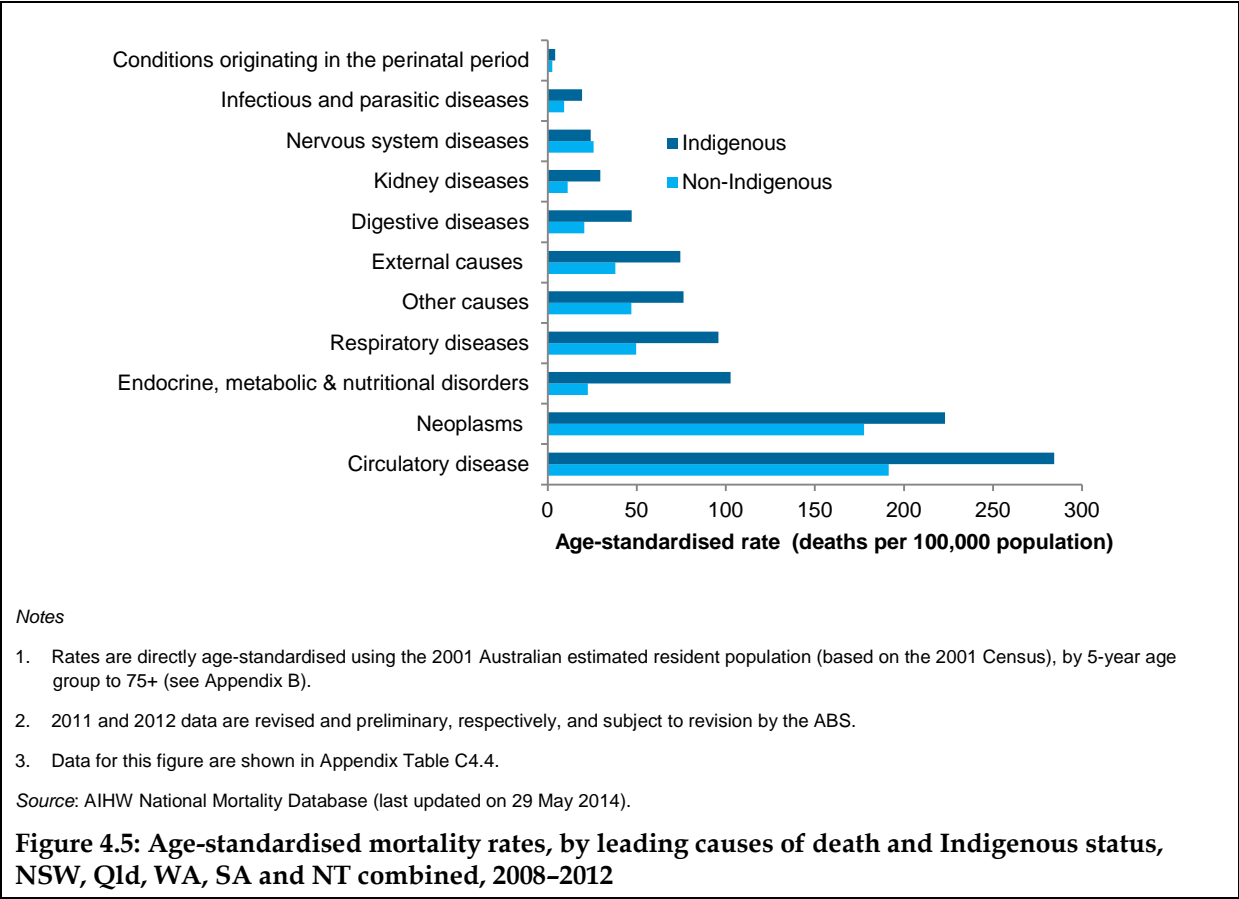
Patterns of mortality in the non-Indigenous population differ somewhat to those in the Indigenous population (Figure 4.5). In 2008–2012, cancer represented a larger proportion of non-Indigenous deaths than Indigenous deaths (30% compared with 20%). In contrast, external causes and endocrine, metabolic and nutritional disorders (which includes diabetes) were less common causes of death for non-Indigenous Australians than for Indigenous Australians (these 2 causes of death represented 15% and 9% of Indigenous deaths compared with 6% and 4% of non-Indigenous deaths respectively) (see Appendix Table C4.1).

After adjusting for age differences, of the broad (ICD-10 chapter level) groupings of diseases, circulatory diseases accounted for the largest gap in death rates between Indigenous and non-Indigenous people in 2008–2012 (24% of the rate difference). This was followed by endocrine, metabolic and nutritional disorders (which includes diabetes) (21% of the rate difference), neoplasms (cancer) (12%) and respiratory diseases (12%) (Appendix Table C4.4).

Indigenous Australians died from circulatory diseases at one and a half times the rate of non-Indigenous Australians, and from endocrine, metabolic and nutritional disorders at 4.5 times the rate of non-Indigenous Australians (Appendix Table C4.4).

Deaths from kidney diseases were also higher in the Indigenous population. In 2008–2012, Indigenous Australians died from kidney diseases at 2.6 times the rate of non-Indigenous Australians and kidney diseases represented almost 5% of the mortality gap.

The higher rate of kidney disease mortality among the Indigenous population is likely to be due to a number of factors including lower rates of kidney transplants for Indigenous Australians with treated end-stage kidney disease compared with non-Indigenous Australians, and increased mortality and transplant failure rate following a kidney transplant (AIHW 2011a). In addition, for Indigenous Australians from remote communities receiving dialysis, a particular issue is isolation and travel, which may prevent such patients receiving adequate dialysis treatment (Spencer et al. 1998) and may result in higher mortality rates (Moist et al. 2008).



The top 10 specific causes of death among Indigenous people (see Table 4.2) accounted for around two-thirds of the gap between Indigenous and non-Indigenous mortality in 2008–2012. Ischaemic heart disease accounted for the largest proportion of the mortality gap for males (19%), while diabetes accounted for the largest proportion of the mortality gap for females (21%). Chronic lower respiratory diseases accounted for 9% of the gap for males and 10% for females (Table 4.2).

Diabetes followed by diseases of the liver had the largest rate ratios of Indigenous to non-Indigenous mortality for both males and females. Indigenous males and females died from diabetes at almost 5 and 7 times the rate of non-Indigenous males and females respectively. For diseases of the liver, Indigenous male and female mortality rates were around 3 and 5 times the rates for non-Indigenous males and females, respectively, in 2008–2012.

Table 4.2: Top 10 causes of death for Indigenous people, by sex and Indigenous status, NSW, Qld, WA, SA and NT combined, 2008–2012

Top 10 underlying causes of death ^(a)	Age standardised rate ^(b) (deaths per 100,000)		Rate ratio ^(c)	Rate difference ^(d) (gap)	Per cent of total gap
	Indigenous	Non-Indigenous			
Males					
Ischaemic heart disease	191.4	110.9	1.7	80.5	18.8
Diabetes mellitus	90.0	18.3	4.9	71.7	16.8
Intentional self-harm	29.9	16.1	1.9	13.8	3.2
Lung cancer	74.8	45.0	1.7	29.8	7.0
Chronic lower respiratory diseases	70.8	31.2	2.3	39.6	9.3
Other forms of heart disease	43.5	32.0	1.4	11.5	2.7
Diseases of liver	28.9	8.7	3.3	20.2	4.7
Cerebrovascular diseases	61.4	44.1	1.4	17.3	4.1
Car occupant injured in transport accident	13.1	4.4	3.0	8.7	2.0
Accidental poisoning by and exposure to noxious substances	10.2	5.9	1.7	4.3	1.0
Other causes	472.4	356.8	1.3	115.6	27.0
All causes	1,112.0	684.6	1.6	427.4	100.0
Females					
Ischaemic heart disease	107.4	73.8	1.5	33.6	9.5
Diabetes mellitus	88.8	13.2	6.7	75.6	21.4
Cerebrovascular diseases	60.1	50.9	1.2	9.1	2.6
Chronic lower respiratory diseases	56.7	21.2	2.7	35.5	10.1
Other forms of heart disease	40.7	29.5	1.4	11.2	3.2
Lung cancer	42.3	24.0	1.8	18.3	5.2
Diseases of liver	20.1	3.7	5.4	16.4	4.6
Kidney failure	27.1	9.2	3.0	17.9	5.1
Breast cancer	24.1	21.8	1.1	2.4	0.7
Intentional self-harm	10.1	4.8	2.1	5.4	1.5
Other causes	379.5	260.3	1.5	119.3	33.8
All causes	869.6	517.1	1.7	352.6	100.0

(a) For the list of ICD-10 codes that were used for this table, see Appendix Table B1.1.

(b) Rates are directly age-standardised using the 2001 Australian estimated resident population (based on the 2001 Census), by 5-year age group to 75+ (see Appendix B).

(c) Rate ratio is the age-standardised Indigenous rate divided by the age-standardised non-Indigenous rate.

(d) Rate difference is the age-standardised Indigenous rate minus the age-standardised non-Indigenous rate.

Note: 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

5 Trends in mortality

This section presents trends in Indigenous all-cause mortality and the major causes of death affecting the Indigenous population. It examines some of the contributing factors to these trends by analysing age, sex, jurisdiction and cause-specific patterns in mortality.

Information on trends is considered important to understanding current mortality levels (see Box 5.1.)

Box 5.1: Counting Indigenous deaths over time

Mortality trends data presented in this chapter are reported for 5 jurisdictions – New South Wales, Queensland, Western Australia, South Australia and the Northern Territory. These jurisdictions are considered to have adequate identification of Indigenous deaths in their recording systems from 2001.

Change over time in the level of Indigenous mortality may partly reflect changing levels of Indigenous identification in mortality data over time. While mortality adjustment factors produced by the ABS from the Census Data Enhancement Indigenous Mortality Quality Study were higher in 2011 than in 2006, this is likely to be due to the large increase in the Indigenous population count between the two Censuses, and does not necessarily reflect a worsening of Indigenous identification in mortality data over time.

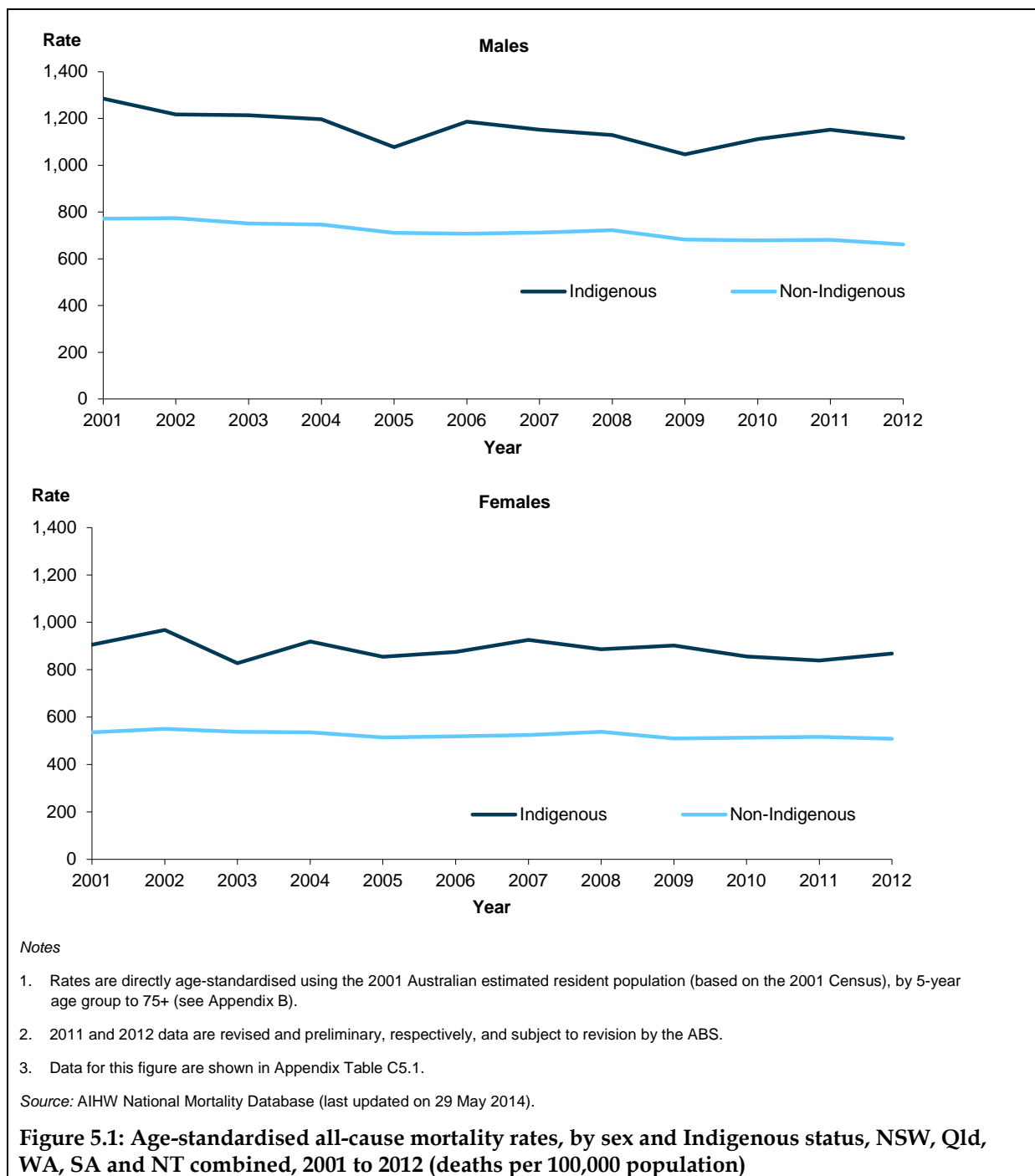
Caution should be exercised when assessing trends in Indigenous mortality over time, as well as when comparing Indigenous and non-Indigenous trends.

5.1 All-cause mortality

Between 2001 and 2012, there was a 9% significant decline in the all-cause age-standardised mortality rate for Indigenous Australians. For Indigenous males, there was a significant decline in the all-cause mortality rate of 12% over the period. For Indigenous females, the decline was 5.5%, but this was not statistically significant (Appendix Table C5.1).

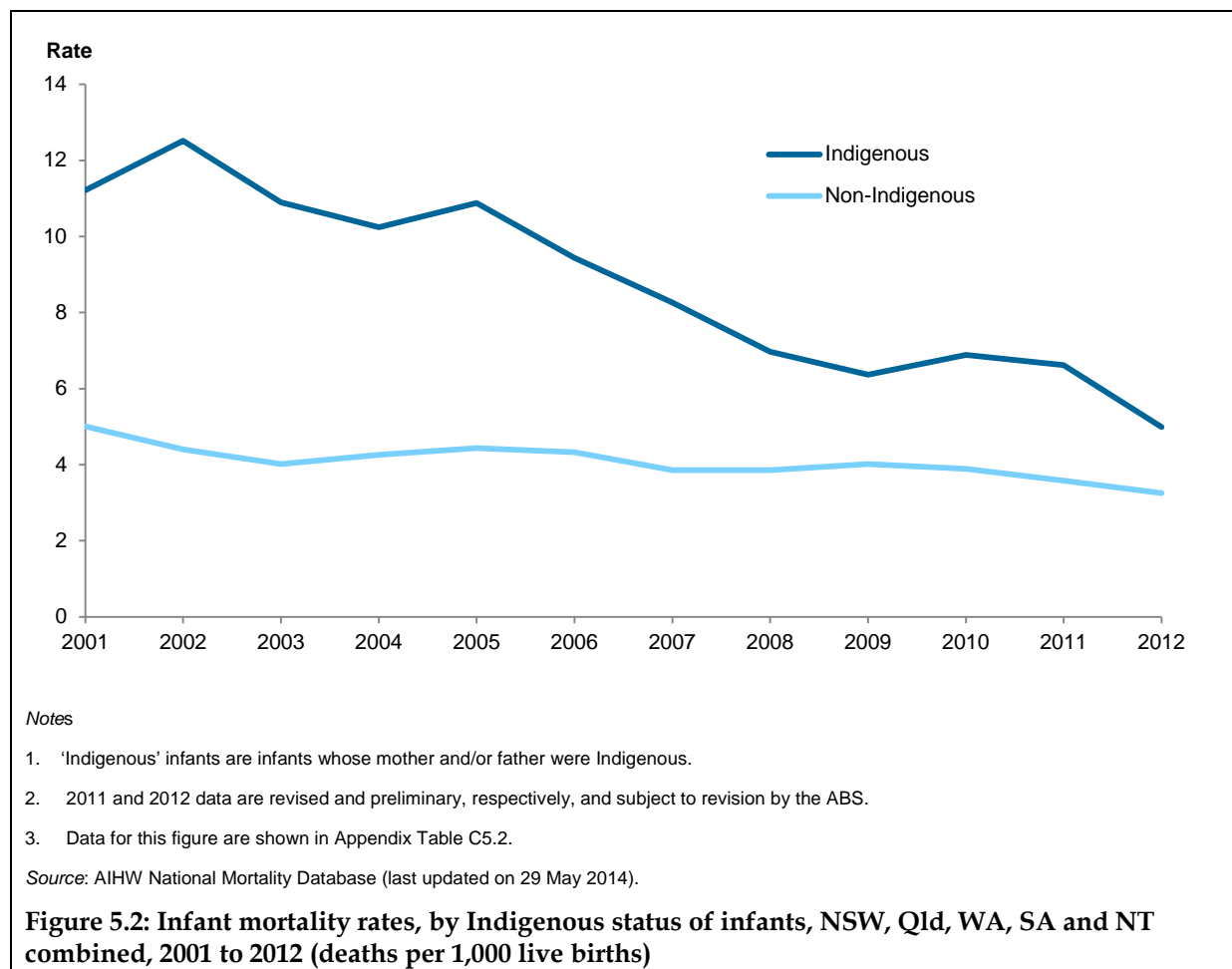
Impact on closing the gap

Analyses suggest that declines in mortality rates for the Indigenous population have been similar to those seen in the non-Indigenous population over the period 2001 to 2012. As a result, there was no significant change in the gap between Indigenous and non-Indigenous males or females over this period.



Age-specific trends

The declines in Indigenous mortality rates described above partly reflect the large declines in Indigenous infant mortality over the last decade. As noted earlier, infant deaths represent about 4% of Indigenous deaths.



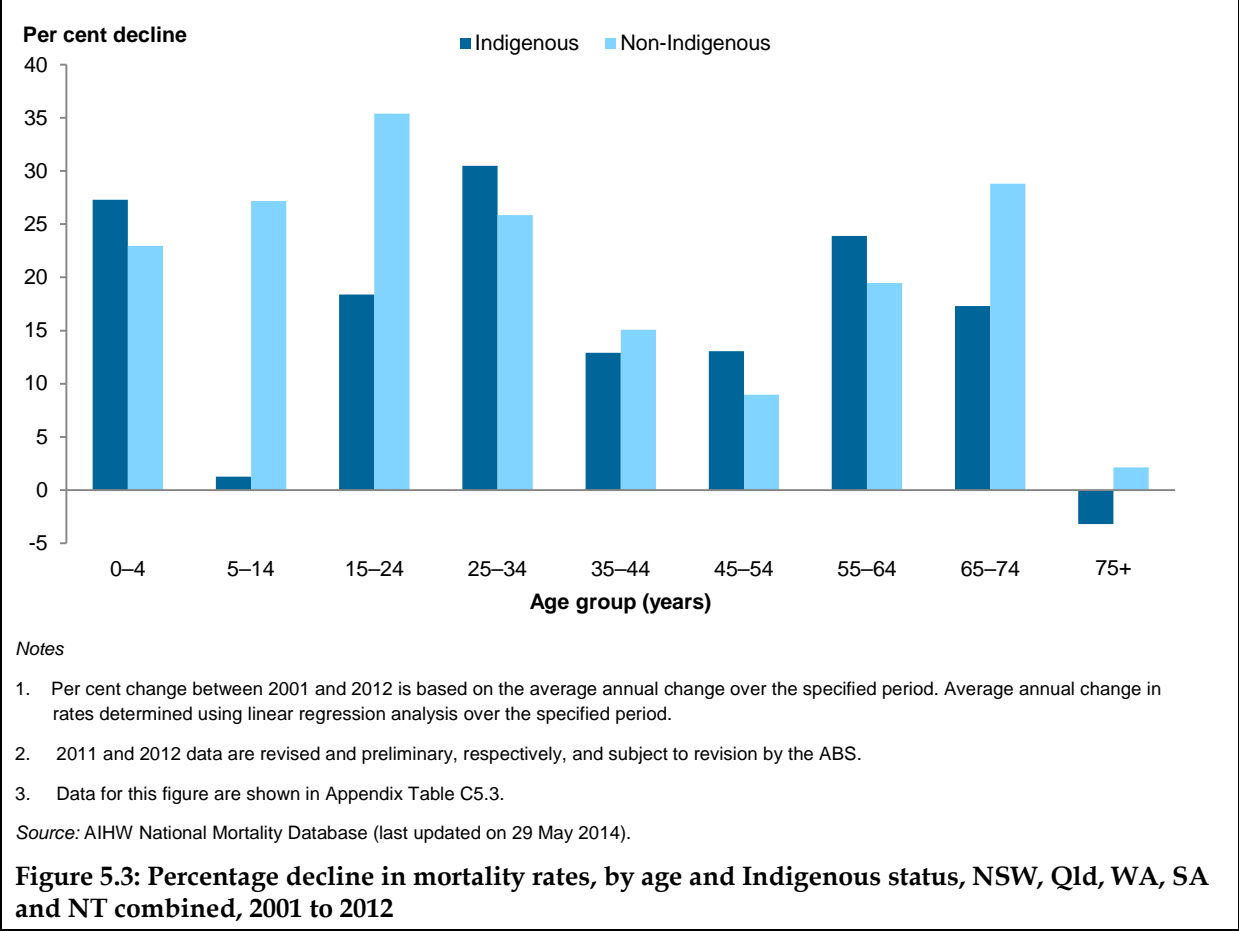
The trend data for New South Wales, Queensland, Western Australia, South Australia and the Northern Territory combined show a 57% decline in the Indigenous infant mortality rate between 2001 and 2012, and a 26% decline in the non-Indigenous rate (Figure 5.2). Over that period, there was a significant decline in the mortality rate difference between Indigenous and non-Indigenous infants such that the gap more than halved.

These large declines in infant mortality in recent decades are likely to be the result of large declines in deaths from sudden unexpected death in infancy (which includes SIDS), and deaths from conditions originating in the perinatal period (AIHW 2013).

Not surprisingly, trends for children aged 0–4 years follow a similar pattern to infant mortality, given that over four-fifths (82%) of Indigenous child deaths are of infants, although the decline for Indigenous children was not as great as for infants (figures 5.2 and 5.3). Between 2001 and 2012, the Indigenous child mortality rate declined by 27% and the non-Indigenous child mortality rate declined by 23%. These data indicate that Australia is on track to meet the COAG target of halving the gap in child mortality within a decade (by 2018).

Analysis of mortality trends for all age groups indicates that there have been significant declines in Indigenous mortality rates between 2001 and 2012 for all age groups except those aged 5–14, 15–24, 35–44 and 75 and over. The largest declines were observed for adults aged 25–34 (31%), followed by children aged 0–4 years (27%) (Figure 5.3).

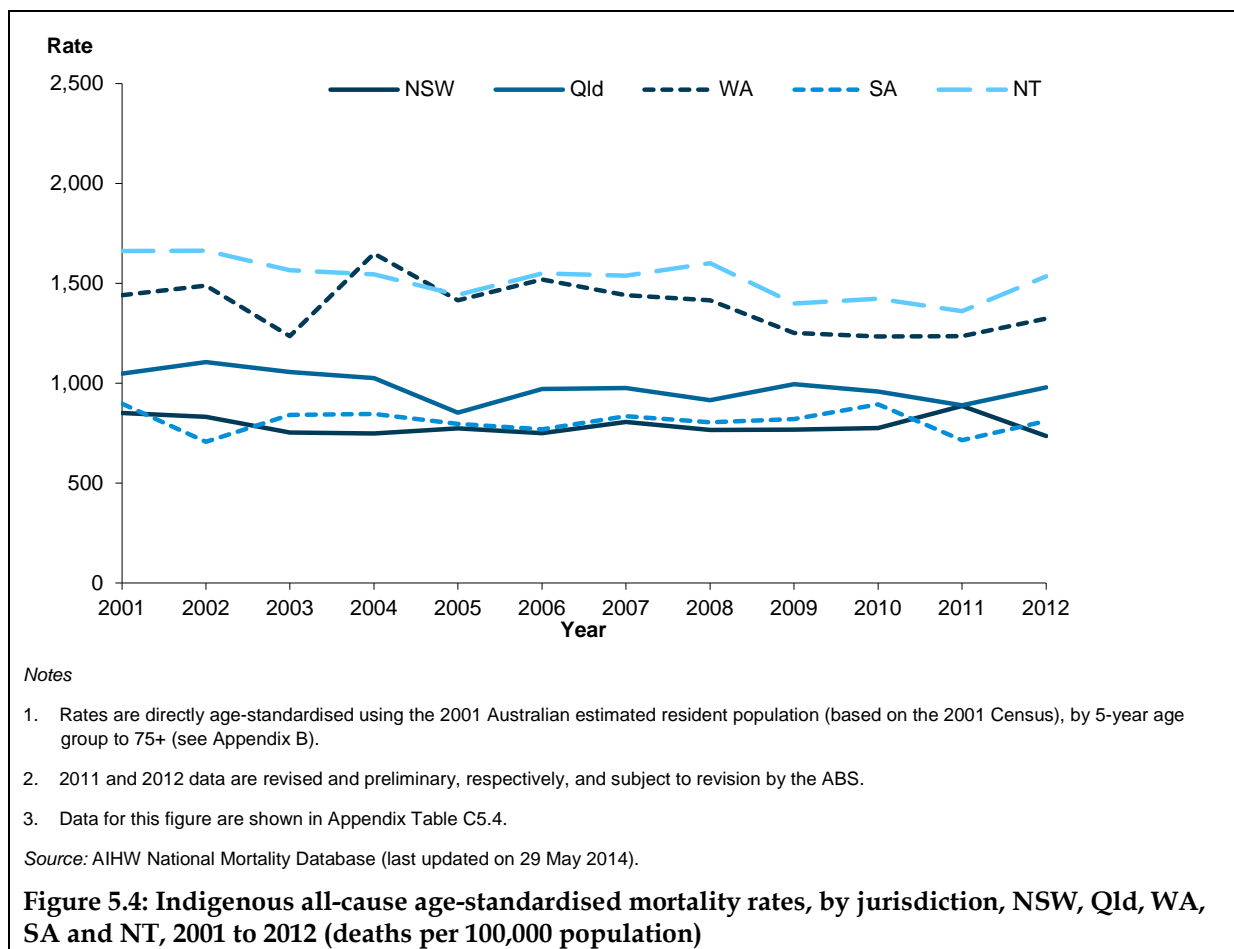
For non-Indigenous people, a slightly different pattern was observed, with the largest declines in age-specific mortality rates observed for adults aged 15–24 (35%), followed by adults aged 65–74 (29%). The declines in mortality for non-Indigenous Australians were larger than those for Indigenous Australians for a number of age groups including 5–14, 15–24, 35–44, 65–74 and 75 and over.



State and territory trends

Analyses of all-cause mortality trends for selected states and territories are presented in Figure 5.4 and Appendix Table C5.4. For the period 2001 to 2012, of the 5 jurisdictions for which Indigenous mortality data are of sufficient quality to report, Queensland and the Northern Territory were the only jurisdictions in which there was a significant decline in Indigenous all-cause mortality rates (12% and 13% respectively). New South Wales, Western Australia and South Australia showed small declines in Indigenous mortality rates; however, these were not statistically significant.

State/territory trends in mortality should be interpreted with caution due to jurisdictional differences in the level of Indigenous under-identification in death registrations data (ABS 2013b) (see Box 1.1) and changes in identification over time which is likely to affect Indigenous mortality rates for New South Wales, Queensland and Western Australia in particular.



5.2 Cause of death trends

Trends in mortality of Indigenous people were examined for the leading causes of death for the period 2001 to 2012 in New South Wales, Queensland, Western Australia, South Australia and the Northern Territory combined. This included circulatory diseases (including ischaemic heart disease and cerebrovascular diseases), respiratory diseases (including COPD, influenza and pneumonia), cancer (including lung cancer), kidney diseases, diabetes, and external causes of death.

Trends presented in this section should be interpreted with caution due to changing Indigenous identification over time.

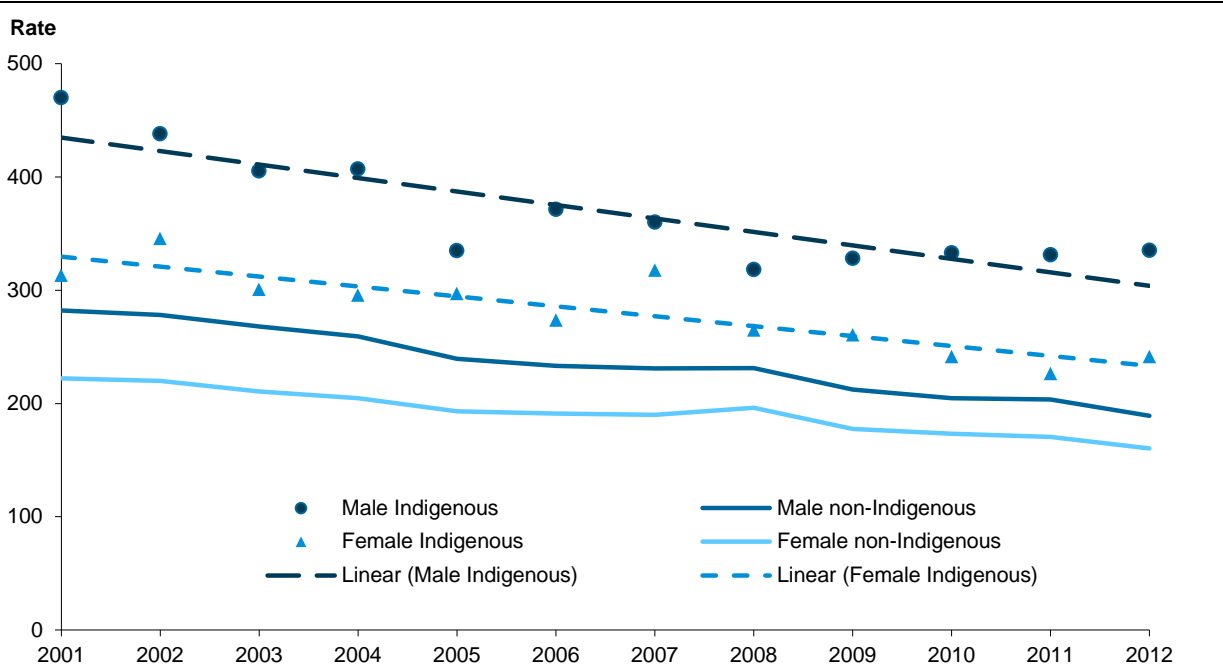
Significant declines in circulatory diseases and respiratory diseases mortality

There have been significant declines in Indigenous mortality rates for both circulatory diseases and respiratory diseases over the period 2001 to 2012. Death rates from all circulatory diseases declined by 30% for Indigenous males and 29% for Indigenous females from 2001 to 2012 (Figure 5.5).

Similar declines in circulatory diseases mortality were evident for non-Indigenous males and females (of 33% and 26%, respectively). There was also a significant decline in the mortality

gap between Indigenous and non-Indigenous females for circulatory diseases (35%), and a smaller decline in the gap for males, although this was not statistically significant.

The main contributors to the decline in Indigenous mortality from circulatory diseases were declines in mortality rates for coronary heart diseases (which includes acute myocardial infarction) which declined by 34%, and cerebrovascular diseases (which includes stroke) which declined by 18%, over the period 2001 to 2012. These declines are likely to be attributable in part to recent declines in Indigenous smoking rates and improved treatment for cardiovascular conditions. A 13-year study in the Northern Territory found that there has been improvement in ischaemic heart disease survival among Indigenous people due to reductions in deaths both pre-hospital and after-hospital admission (You et al. 2009).



Notes

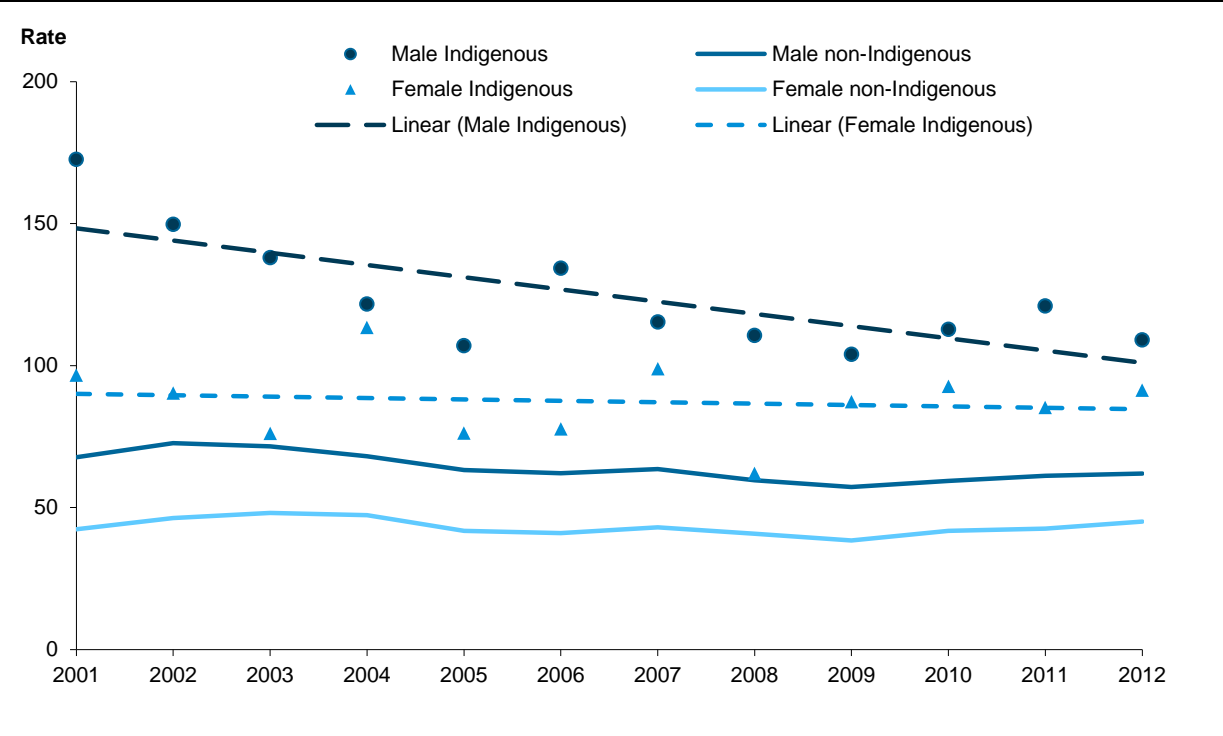
1. Rates are directly age-standardised using the 2001 Australian estimated resident population (based on the 2001 Census), by 5-year age group to 75+ (see Appendix B).
2. 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.
3. Data for this figure are shown in Appendix Table C5.5.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Figure 5.5: Age-standardised mortality rates for circulatory diseases, by sex and Indigenous status, NSW, Qld, WA, SA and NT combined, 2001 to 2012 (deaths per 100,000 population)

Between 2001 and 2012, death rates from all respiratory diseases for Indigenous males declined by 32% (Figure 5.6). For Indigenous females, there was no significant change in mortality rates from respiratory diseases, with rates fluctuating somewhat from year to year. The main contributors to the decline in respiratory disease mortality observed for Indigenous males are declines in mortality from influenza and pneumonia (which declined by 56% between 2001 and 2012), and chronic obstructive pulmonary disease (which declined by 29% between 2001 and 2012).

While a decline in respiratory diseases mortality was also evident for non-Indigenous males, the decline was not as great as for Indigenous males. This resulted in a significant closing of the gap in respiratory disease mortality for males (of around 45%) between 2001 and 2012.



Notes

1. Rates are directly age-standardised using the 2001 Australian estimated resident population (based on the 2001 Census), by 5-year age group to 75+ (see Appendix B).
2. 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.
3. Data for this figure are shown in Appendix Table C5.6.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

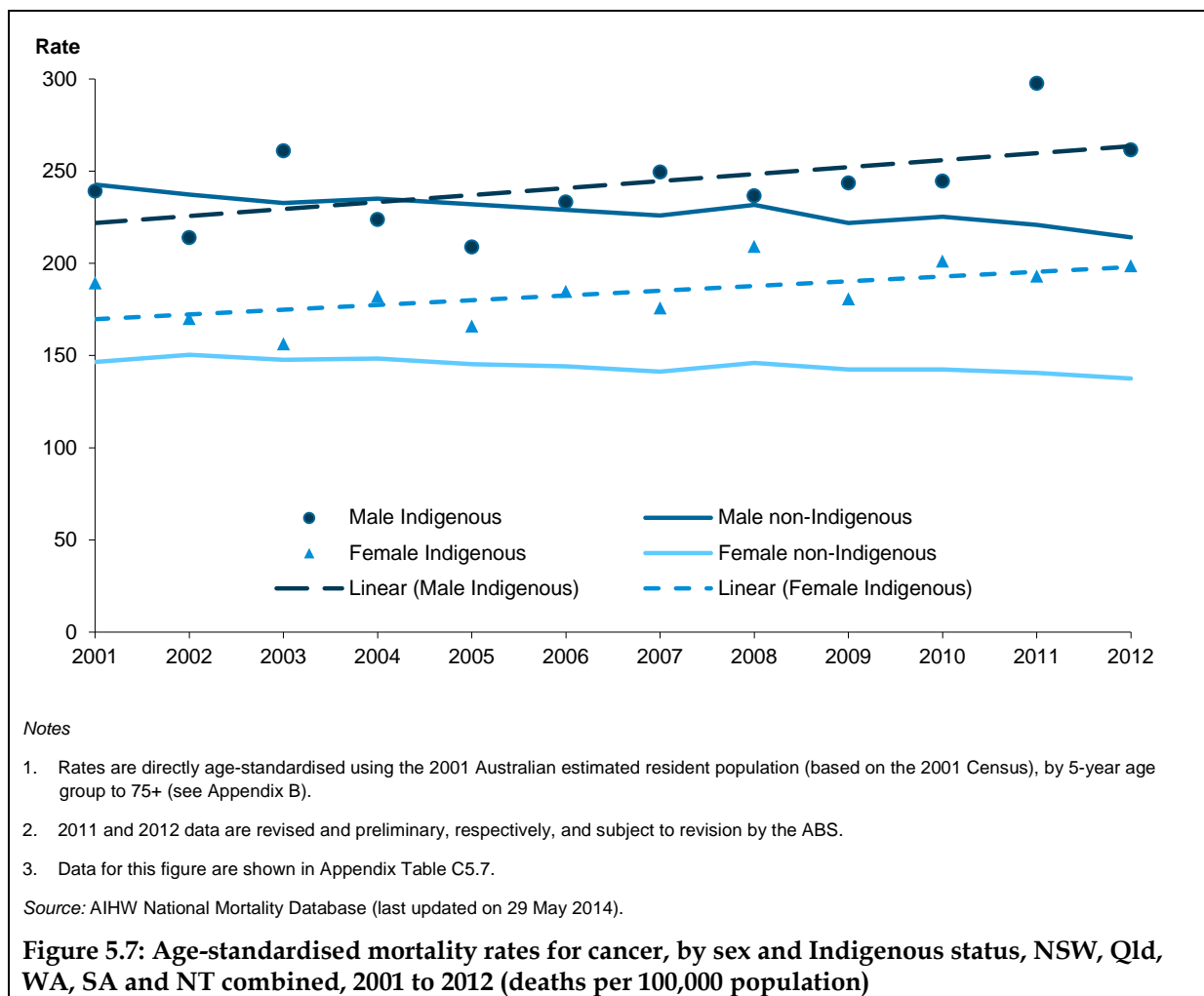
Figure 5.6: Age-standardised mortality rates for respiratory diseases, by sex and Indigenous status, NSW, Qld, WA, SA and NT combined, 2001 to 2012 (deaths per 100,000 population)

A widening of the gap in cancer mortality

Over the period 2001 to 2012, there has been an increase in the Indigenous cancer mortality rate; however the increase is only significant for females (a 17% increase). Over the same period, cancer mortality rates for non-Indigenous Australians have fallen significantly, leading to significant increases in the Indigenous to non-Indigenous mortality gap due to cancer for both males and females (Figure 5.7).

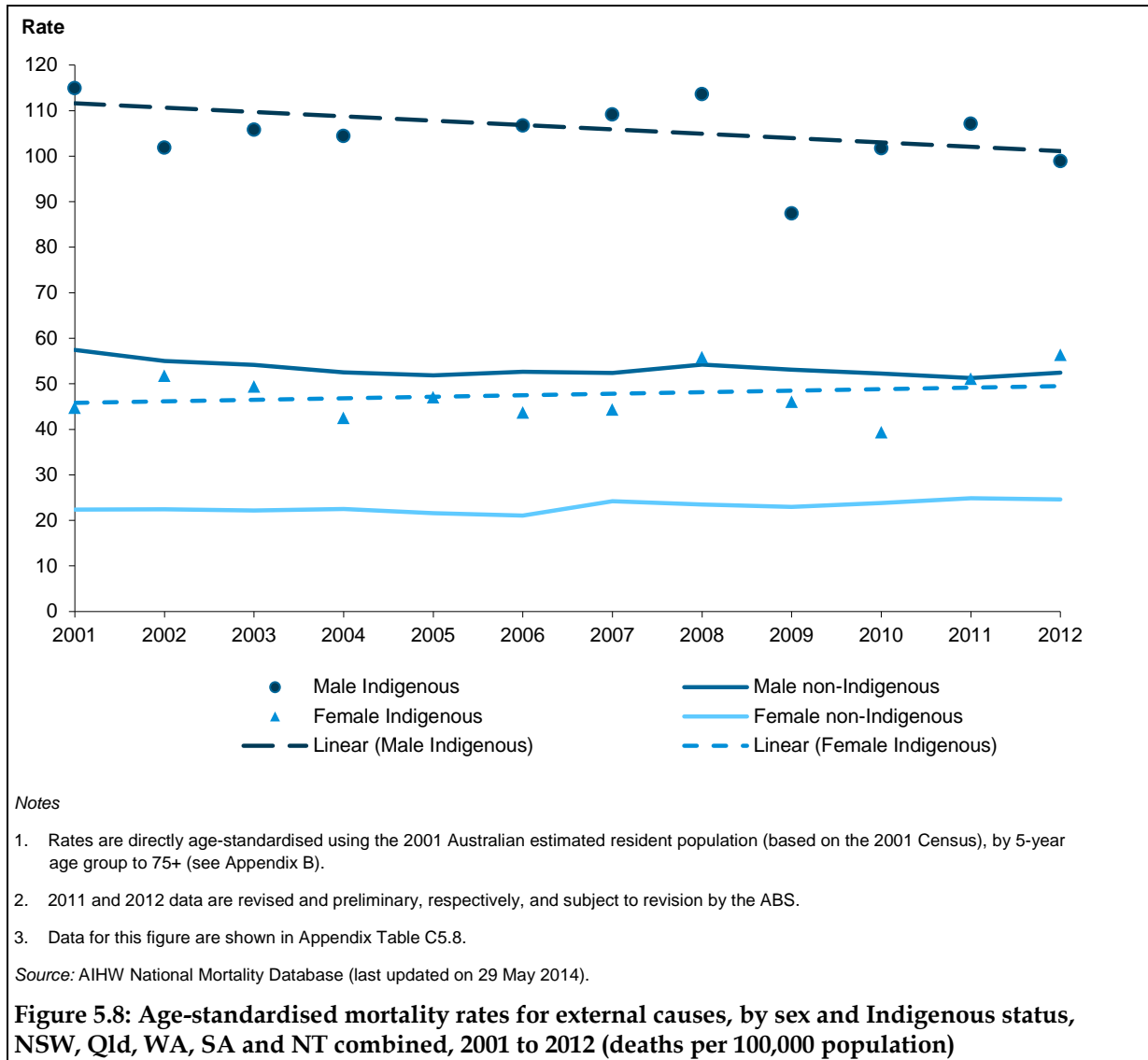
Lung cancer mortality rates have increased for Indigenous males and females over the period 2001 to 2012, although not significantly. In comparison, lung cancer mortality rates have significantly declined for non-Indigenous males, and significantly increased for non-Indigenous females since 2001.

These rates are based on small numbers of deaths and therefore should be interpreted with caution.



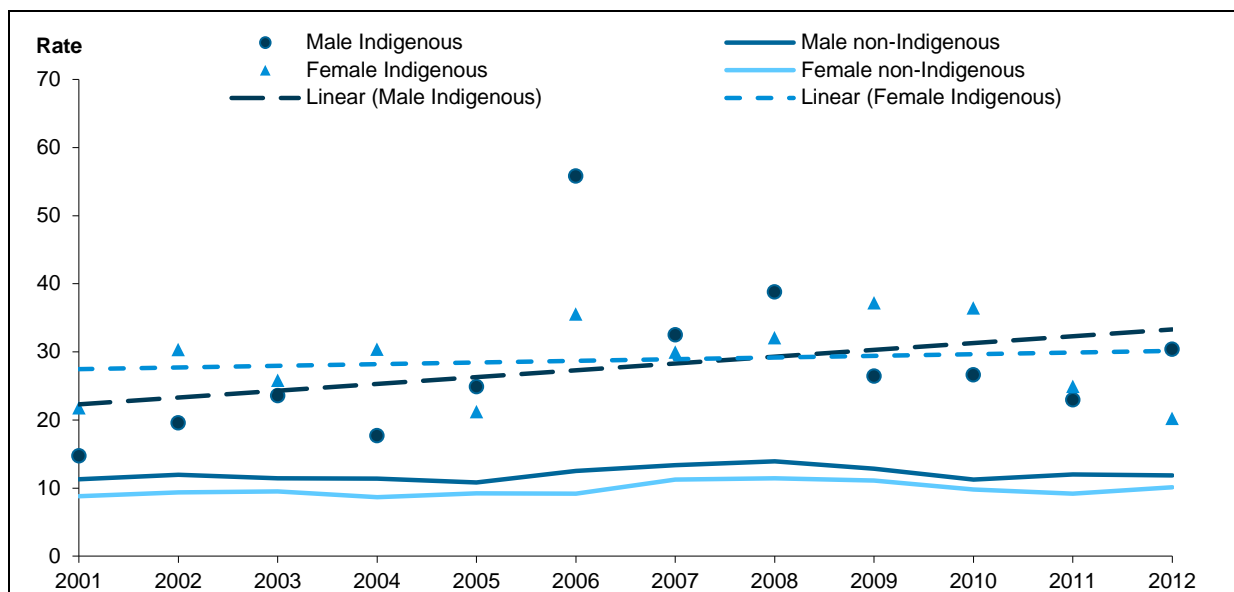
Deaths from external causes have remained relatively stable

Indigenous mortality rates for external causes (for example, injury or poisoning) have remained relatively stable between 2001 and 2012 at around 100 deaths per 100,000 for males and 50 per 100,000 for females (Figure 5.8).



No clear trend in kidney disease or diabetes mortality

There was large year-to-year fluctuation in mortality rates for kidney diseases (which includes kidney failure) and diabetes among Indigenous Australians between 2001 and 2012, which is largely the result of small numbers of Indigenous deaths from these causes each year. While the fitted trend suggests an increase in Indigenous mortality rates from kidney diseases and diabetes for Indigenous males between 2001 and 2012, these trends were not statistically significant (figures 5.9 and 5.10).

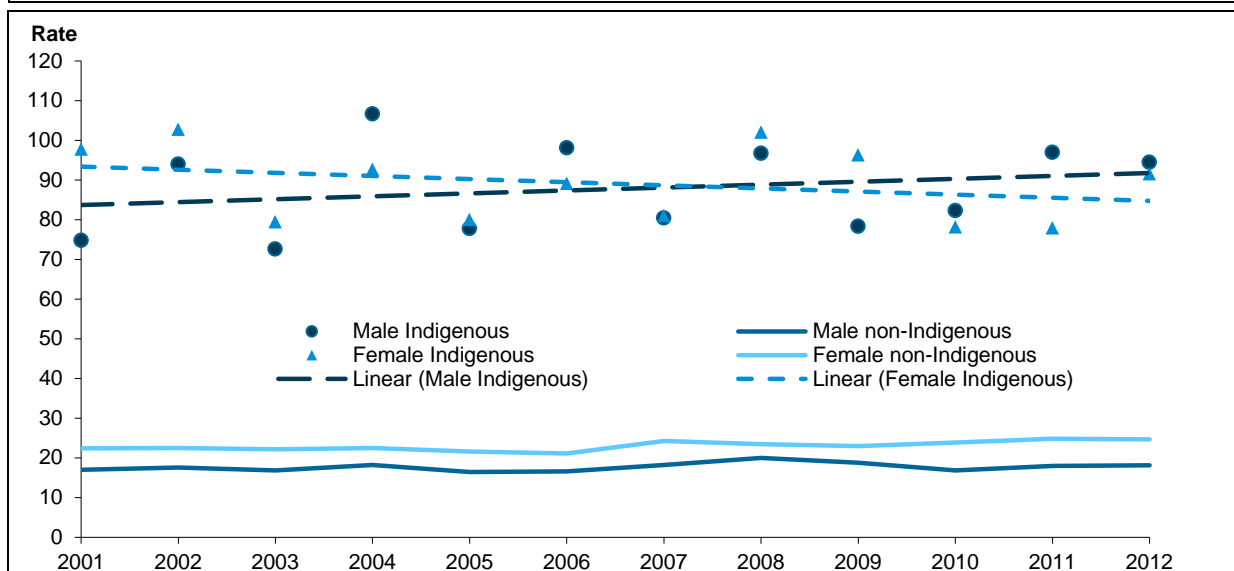


Notes

1. Rates are directly age-standardised using the 2001 Australian estimated resident population (based on the 2001 Census), by 5-year age group to 75+ (see Appendix B).
2. 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.
3. Data for this figure are shown in Appendix Table C5.9.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Figure 5.9: Age-standardised mortality rates for kidney diseases, by sex and Indigenous status, NSW, Qld, WA, SA and NT combined, 2001 to 2012 (deaths per 100,000 population)



Notes

1. Rates are directly age-standardised using the 2001 Australian estimated resident population (based on the 2001 Census), by 5-year age group to 75+ (see Appendix B).
2. 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.
3. Data for this figure are shown in Appendix Table C5.10.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Figure 5.10: Age-standardised mortality rates for diabetes, by sex and Indigenous status, NSW, Qld, WA, SA and NT combined, 2001 to 2012 (deaths per 100,000 population)

6 Conclusion

Six broad groups of diseases represent 83% of Indigenous deaths. These are circulatory diseases (26%), cancer (20%), external causes (15%), endocrine, metabolic and nutritional disorders (which include diabetes) (9%), respiratory diseases (8%) and digestive diseases (6%). Indigenous Australians have higher mortality rates than non-Indigenous Australians for all of these causes of death.

Patterns of mortality in the non-Indigenous population differ somewhat to those in the Indigenous population. In 2008–2012, cancer represented a much larger proportion of non-Indigenous deaths than Indigenous deaths (30% compared with 20%), while external causes and diabetes were less common causes of death for non-Indigenous Australians. Around two-thirds of non-Indigenous deaths occurred at or after the age of 75, compared with only 19% of Indigenous deaths.

The relatively high mortality rates for Indigenous Australians, particularly in middle age (45–64), reflect the high rates of chronic disease and injury among the Indigenous population, the higher prevalence of modifiable and behavioural risk factors such as smoking, and the disproportionate levels of educational, employment and social disadvantage faced by many Indigenous Australians compared with non-Indigenous Australians.

Four groups of chronic conditions accounted for about two-thirds of the gap in mortality between Indigenous and non-Indigenous Australians in 2008–2012: circulatory diseases (24% of the gap), endocrine, metabolic and nutritional disorders (including diabetes) (21%), cancer (12%), and respiratory diseases (12%).

Overall, mortality rates for the Indigenous population declined between 2001 and 2012; however there are mixed trends when specific causes of death are examined. There have been notable improvements in Indigenous mortality rates from circulatory and respiratory diseases, between 2001 and 2012, but little or no improvement in mortality from cancer or external causes.

Continued effort in reducing Indigenous deaths from chronic diseases (for example, through risk factor prevention and chronic disease management) is likely to result in improvements in Indigenous mortality and life expectancy into the future.

Appendix A: Data sources

This appendix presents information on the main data sources used in preparing this report.

National Mortality Database

The National Mortality Database (NMD) is a national collection of unit record level data maintained by the AIHW. The version of the NMD that was used for analyses for this report was last updated with data supplied to the AIHW on 29 May 2014. The database comprises most causes of death and other characteristics of the person, such as their sex, age at death, area of usual residence and Indigenous status. Data are sourced from the Registrars of Births, Deaths and Marriages in each state and territory and the National Coroners Information System, and coded nationally by the Australian Bureau of Statistics. An automated process is used to code cause of death information to an international standard – currently, the *International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10)* (WHO 2014). Information on the cause of death is supplied by the medical practitioner certifying the death, or by a coroner. The data in the NMD are updated each calendar year, and these updates include new data and revisions to coded causes of death for previous years (see ‘Revision process’ below).

Registration of deaths of Indigenous people

It is considered likely that most deaths of Aboriginal and Torres Strait Islander people are registered. However, a proportion of these deceased are not reported as Aboriginal or Torres Strait Islander by the family, health worker or funeral director during the death registration process. That is, while data are provided to the ABS for the Indigenous status question for 99% of all deaths, there are concerns regarding the accuracy of the data. The Indigenous status question is not always directly asked of relatives and friends of the deceased by the funeral director. The incompleteness of Indigenous identification means the number of deaths recorded as Indigenous results in underestimates of the true levels of mortality. The ABS and AIHW have both undertaken projects to estimate the true number of Indigenous deaths (ABS 2008, 2013c; AIHW 2012a).

Indigenous mortality rates presented in this report have not been adjusted for Indigenous under-identification. This is because while adjustment factors have been published by the ABS using results from the Census Data Enhancement Indigenous Mortality Quality Study for 2011–2012, the AIHW is also in the process of finalising adjustment factors from the Enhanced Mortality Database project at various levels of disaggregation, and preliminary results indicate notable differences in adjustment factors from those produced by the ABS (see Box 1.1 for further information on these studies).

While the identification of Indigenous Australians in deaths data is incomplete in all state and territory registration systems, 5 jurisdictions (New South Wales, Queensland, Western Australia, South Australia and the Northern Territory) have been assessed by the ABS and the AIHW as having adequate identification from at least 2001 onwards. Mortality data for these 5 jurisdictions should not be assumed to represent the experience in the other jurisdictions. Data for these 5 jurisdictions over-represent Indigenous populations in less urbanised and more remote locations.

Deaths registered in 2010 with a usual residence of Queensland have been adjusted to exclude deaths registered in 2010 that occurred before 2007. This is to minimise the impact of

late registration of deaths due to recent changes in the timeliness of death registrations in Queensland.

Western Australian Indigenous deaths for 2007, 2008 and 2009 have been revised to correct for a data quality issue that resulted in the over-reporting of Indigenous deaths during this period.

Deaths for which the Indigenous status of the deceased was not reported have been excluded from the analyses. As such, the categories used for presentation of mortality analysis are *Indigenous Australians* and *non-Indigenous Australians*.

Revision process

Up to, and including deaths registered in 2006, the ABS 'causes of death' processing was finalised at a point in time, and data for those deaths were provided to the AIHW once only. For mortality data registered in 2007 onwards, the ABS introduced a process of revisions to cause of death data. This new process improves the cause of death information by enabling the use of additional information relating to coroner certified deaths either 12 or 24 months after initial processing. This means that data for 2007 onwards may be revised up to 2 times after initial supply.

The first release of the coded causes of death is referred to as the 'preliminary' version. In this version, deaths that were reported to the coroner but remain as an open case, usually have a non-specific cause (unknown) cause of death. The second release is the 'revised' version, and the third release is the 'final'. In this report, cause of death data for 2010 are final, and cause of death data for 2011 and 2012 are revised and preliminary, respectively, and subject to revision by the ABS.

Presentation of mortality data

Mortality data can be presented by year of death or by year of registration of the death. In this report, and following usual AIHW conventions, data were analysed using the year of registration of death.

Data by jurisdiction are presented by the state or territory of the usual residence of the deceased, rather than the state or territory where the death occurred.

Population data

To calculate the rates presented in this report, estimated resident population data as sourced from the ABS have been used. The Indigenous population estimates used in this report are the Indigenous population estimates and projections based on the 2011 Census (Series B) (ABS 2014). The 2011 Census enumerated the Indigenous population from responses to a question on a person's Indigenous status. The estimated Indigenous resident population for 2011 is computed using this enumerated Indigenous population from the Census, and adjusted for undercount based on results from the PES as well as for non-response to the Indigenous status question. Population numbers for other years are projected based on assumed future levels of fertility, mortality and migration (ABS 2014).

Measuring the size of the Indigenous population is not straightforward. The Census count of the number of Aboriginal and Torres Strait Islander Australians has varied considerably over recent decades. Analysis of the size of the increases between Censuses demonstrates that these changes are not entirely due to demographic factors such as births, deaths and migration. Instead, they are also in part due to improved enumeration and changes in propensity to identify as Aboriginal or Torres Strait Islander (ABS 1999, 2013a).

Appendix B: Technical information

This appendix presents information on how the statistics in this report were calculated, and other technical points.

Age-specific rates

An 'age-specific rate' is defined as the number of events for a specified age group over a specified period (for example, a year) divided by the total population at risk of the event in that age group. Age-specific rates in this report were calculated by dividing, for example, the number of deaths in each specified age group by the corresponding population in the same age group.

Age-standardised rates

Age-standardised rates enable comparisons to be made between populations that have different age structures, such as the Indigenous and non-Indigenous populations.

In this report, age-standardised rates have been directly age-standardised using the 30 June 2001 estimated resident population in Australia (based on the 2001 Census) as the standard population, using 5-year age groups from 0–4 to 75 and over (ABS 2013e). This effectively removes the influence of the age structure on the summary rate. This compares with crude rates, which do not take into account the influence of the age structure on the summary rate.

In the calculation of age-specific and age-standardised mortality rates presented in this report, deaths for which age was 'not stated' were apportioned across each age group (also taking into account sex, Indigenous status and year).

Cause of death classification

Data are presented on the leading causes of death for Indigenous Australians based on the *International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10)* (WHO 2014) disease coding at the chapter level and sub-chapter level (see Box 4.1).

The coding produces an underlying cause – that is, the disease or condition which initiated the sequence of events resulting in death – and, for most deaths, associated causes (that is, diseases or conditions that contributed to the death but were not the underlying cause).

Coding causes of death to an international standard enables the comparability of statistics over time and between countries. That is, death statistics that are coded using the same rules for ascertaining the underlying cause of death are more comparable. Once coded, causes of death can be categorised into disease groupings. Disease groupings are useful for tabulating causes of death in a meaningful way and for examining patterns and trends by cause of death and other important population attributes. The ICD comprises more than 14,000 causes of death and illness; analysis of groups of causes is therefore more manageable than individual causes.

The causes of death statistics presented in this report are based on the underlying cause of death which is the disease or injury that initiated the sequence of events leading directly to death. Accidental and violent deaths are classified according to the external cause – that is, to the circumstances of the accident or violence that produced the injury, rather than the nature of the injury.

Table B1.1: ICD-10 codes used to define specific causes of death^(a), 2008–2012

Specific underlying cause of death	ICD-10 codes
Ischaemic heart disease	I20–I25
Diabetes mellitus	E10–E14
Intentional self-harm	X60–X84
Lung cancer	C33–C34
Chronic lower respiratory diseases	J40–J47
Other forms of heart disease	I30–I52
Diseases of liver	K70–K77
Cerebrovascular diseases	I60–I69
Car occupant injured in transport	V40–V49
Accidental poisoning by and exposure to noxious substances	X40–X49
Kidney failure	N17–N19
Breast cancer	C50

(a) These ICD-10 codes were used for tables 4.1 and 4.2.

Source: WHO 2014.

Crude rates

A ‘crude rate’ is defined as the number of events (for example, deaths of Indigenous people) over a specified period (for example, a year) divided by the total population at risk of the event (for example, number of Indigenous people). This compares with ‘age-standardised rates’, which remove the influence of the age structure on the summary rate.

Measuring ‘the gap’

There are two methods commonly used for measuring the gap – the absolute difference (rate difference) and relative difference (rate ratio). The rate difference is the Indigenous rate minus the non-Indigenous rate, while the rate ratio is the Indigenous rate divided by the non-Indigenous rate.

For trend analyses in particular, the rate ratio alone can sometimes be misleading. In cases where the non-Indigenous rate is particularly small and the Indigenous rate is particularly large, the situation can arise where there is an improvement in both the Indigenous and non-Indigenous rates with the rates diverging but the ratio decreasing (or vice versa). In such cases, the rate difference is a more accurate reflection of the pattern in trends.

Throughout this report the term ‘the gap’ is used to refer to the rate difference – that is, the Indigenous rate minus the non-Indigenous rate. For trend analyses, references to the widening or narrowing of the gap refer to changes in the rate difference over time. References to significant changes in the gap over time reflect statistically significant changes at the $p < 0.05$ level in the rate difference over the reported time period.

Rate difference

For this report, rate differences were calculated by subtracting the age-standardised rate for Indigenous Australians from the age-standardised rate for non-Indigenous Australians for the characteristic of interest.

Rate ratio

For this report, rate ratios were calculated by dividing the age-standardised rate for Indigenous Australians with a particular characteristic by the age-standardised rate for non-Indigenous Australians with the same characteristic.

A rate ratio of 1 indicates that the prevalence of the characteristic is the same in the Indigenous and non-Indigenous populations. Rate ratios that are greater than 1 indicate higher prevalence in the Indigenous population and rate ratios less than 1 indicate higher prevalence in the non-Indigenous population.

Time trends

Throughout this report, time series analyses have used linear regression analysis to determine whether there have been significant increases or decreases in the observed rates over the period. In general, regression modelling has the advantage of jointly considering the information contained in the series of rates, rather than considering each time point separately. Analysing the series of rates as a unit imposes stability and, consequently, the confidence band around the set of predicted values from regression analysis will be narrower than the confidence limits calculated around the rates separately. Any statistical test based on regression results, will therefore be more powerful.

Annual change

The average annual change (slope estimate) in rates, rate ratios and rate differences are calculated using linear regression, which uses the least squares method to calculate a straight line that best fits the data and returns an array that best describes the line. The simple linear regression line, $Y = a + bX$, or 'slope' estimate was used to determine the average annual change in the data over the period.

Per cent change

Per cent change is determined by calculating the average annual change (slope estimate) over the period by the number of data points less 1. This is then divided by the value calculated for the first year in the series (based on the fitted linear regression line) and multiplied by 100.

Statistical significance of trend data

For trend analyses, the 95% confidence intervals (CIs) for the standard error of the slope estimate (average annual change) based on linear regression are used to determine whether the apparent increases or decreases in the data are statistically significant at the $p < 0.05$ level. The formula used to calculate the CIs for the standard error of the slope estimate is:

$$95\% CI(x) = x \pm t_{(n-2,0.025)} \times SE(x)$$

where x is the average annual change (slope estimate) and n is the number of data points in the trend analyses.

If the upper and lower 95% confidence intervals do not include zero, then it can be concluded that there is statistical evidence of an increasing or decreasing trend in the data over the study period.

Significant changes are denoted with a * against the per cent change statistics included in relevant tables.

Appendix C: Additional tables

Table C3.1: Age distribution of deaths, by age, sex and Indigenous status, NSW, Qld, WA, SA and NT combined, 2008–2012

Age group (years)	Per cent of deaths			
	Indigenous		Non-Indigenous	
	Males	Females	Males	Females
<1	4.5	4.0	0.9	0.7
1–4	0.9	1.1	0.2	0.1
0–4	5.4	5.1	1.0	0.8
5–9	0.5	0.6	0.1	0.1
10–14	0.5	0.6	0.1	0.1
15–19	2.8	1.5	0.4	0.2
20–24	3.4	1.9	0.6	0.3
25–29	3.5	2.3	0.8	0.3
30–34	4.2	2.4	0.9	0.4
35–39	5.8	5.0	1.2	0.6
40–44	7.6	6.1	1.5	0.9
45–49	8.8	6.9	2.3	1.5
50–54	9.2	8.4	3.4	2.1
55–59	9.3	9.2	4.6	2.9
60–64	9.0	8.7	6.5	4.1
65–69	8.2	8.3	8.1	5.0
70–74	7.5	9.3	10.2	6.9
75–79	5.9	8.3	13.4	10.0
80–84	4.4	6.7	17.5	16.5
85+	4.1	8.9	27.5	47.4
Total	100.0	100.0	100.0	100.0

Notes

1. 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.
2. Records where age is not stated have been apportioned across other age groups.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Table C3.2: Age-specific mortality rates, by sex and Indigenous status, NSW, Qld, WA, SA and NT combined, 2008–2012 (deaths per 100,000 population)

Age group (years)	Males		Females	
	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous
5–24	71.0	32.3	38.5	15.8
25–34	247.8	80.0	124.1	32.6
35–44	493.1	127.4	310.2	68.3
45–54	873.9	275.6	573.6	166.3
55–64	1,594.4	644.0	1,174.4	380.2
65–74	3,333.9	1,652.3	2,588.1	995.5
75 and over	7,889.5	7,393.0	7,062.1	6,345.8
Total (crude)	478.1	717.5	389.9	672.8
Total (age standardised)^(a)	1,158.2	723.5	907.4	546.5

(a) Rates are directly age-standardised using the 2001 Australian estimated resident population (based on the 2001 Census), by 5-year age group to 75+. For other data notes, see Appendix B.

Note: 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Table C3.3: The gap (rate difference) between Indigenous and non-Indigenous Australians in potential years of life lost before age 65 (PYLL) per 1,000 population, NSW, Qld, WA, SA and NT combined, 2007–2011

Age group (years)	Rate difference (PYLL per 1,000 population)
0–4	376.3
5–9	31.1
10–14	36.2
15–19	117.7
20–24	222.2
25–29	255.1
30–34	303.3
35–39	429.3
40–44	512.3
45–49	516.9
50–54	468.5
55–59	408.6
60–64	193.4

Source: Australian Government Department of Social Services 2013.

Table C4.1: Broad causes of death, by Indigenous status, NSW, Qld, WA, SA and NT combined, 2008–2012 (per cent of total deaths)

Broad cause of death (ICD-10 codes)	Indigenous	Non-Indigenous
Circulatory diseases (I00–I99)	25.5	32.3
Neoplasms (C00–D48)	20.2	30.1
External causes (V00–Y98)	15.1	6.0
Endocrine, metabolic & nutritional disorders (E00–E89)	9.1	3.8
Respiratory diseases (J00–J99)	7.7	8.4
Digestive diseases (K00–K93)	5.6	3.5
Mental and behavioural disorders (F00–F99)	2.6	4.9
Nervous system diseases (G00–G99)	2.6	4.3
Kidney diseases (N00–N29)	2.5	1.9
Other causes	9.3	4.9
All causes	100.0	100.0

Note: 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Table C4.2: Leading causes of death among Indigenous infants and children, NSW, Qld, WA, SA and NT combined, 2008–2012 (per cent)

Cause of death (ICD-10 codes)	Infants	Children aged 1–4
Certain conditions originating in the perinatal period (P00–P96)	47.7	1.7
Symptoms, signs, & ill-defined conditions (R00–R99)	19.9	6.0
Congenital malformations (Q00–Q99)	15.0	6.0
Diseases of the respiratory system (J00–J99)	4.3	6.8
Infectious and parasitic diseases (A00–B99)	3.7	4.3
External causes (V00–Y98)	3.5	53.0
Diseases of the nervous system (G00–G99)	2.0	4.3
Diseases of the circulatory system (I00–I99)	1.8	9.4
Other causes	2.2	8.6
All causes	100.0	100.0

Note: 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Table C4.3: Leading causes of death among Indigenous Australians, by age, NSW, Qld, WA, SA and NT combined, 2008–2012 (per cent)

Cause of death (ICD-10 codes)	Age group (years)					
	5–14	15–34	35–44	45–54	55–64	65+
Circulatory diseases (I00–I99)	3.3	12.1	27.6	30.6	26.8	29.9
External causes (V00–Y98)	50.0	65.3	25.5	11.1	4.1	2.2
Neoplasms (C00–D48)	8.2	4.8	12.2	20.8	29.8	25.8
Endocrine, metabolic and nutritional disorders (E00–E89)	0.0	1.7	6.6	9.3	13.4	11.5
Respiratory diseases (J00–J99)	4.9	2.5	4.1	6.0	8.1	11.6
Kidney diseases (N00–N29)	0.8	0.5	2.0	2.6	3.3	3.3
Other causes	32.8	13.0	22.0	19.6	14.6	15.7
All causes	100.0	100.0	100.0	100.0	100.0	100.0

Note: 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Table C4.4: Age-standardised mortality rates, by leading causes of death and Indigenous status, NSW, Qld, WA, SA and NT combined, 2008–2012

Underlying cause of death (ICD-10 codes)	Deaths per 100,000 ^(a)			Rate difference ^(c) (gap)	Per cent of total gap (rate difference)
	Indigenous	Non-Indigenous	Rate ratio ^(b)		
Circulatory diseases (I00–I99)	284.3	191.4	1.5	93.0	24.1
Neoplasms (C00–D48)	223.0	177.6	1.3	45.3	11.8
Endocrine, metabolic and nutritional disorders (E00–E89)	102.7	22.6	4.5	80.1	20.8
Respiratory diseases (J00–J99)	95.8	49.7	1.9	46.1	12.0
External causes (V00–Y98)	74.5	38.0	2.0	36.4	9.4
Digestive diseases (K00–K93)	47.2	20.5	2.3	26.7	6.9
Kidney diseases (N00–N29)	29.6	11.2	2.6	18.4	4.8
Nervous system diseases (G00–G99)	24.1	25.8	0.9	-1.6	-0.4
Infectious and parasitic diseases (A00–B99)	19.3	9.2	2.1	10.2	2.6
Certain conditions originating in perinatal period (P00–P96)	4.3	2.6	1.6	1.6	0.4
Other causes	76.3	47.0	1.6	29.3	7.6
Total	981.1	595.6	1.6	385.5	100.0

(a) Rates are directly age-standardised using the 2001 Australian estimated resident population (based on the 2001 Census), by 5-year age group to 75+. For other data notes, see Appendix B.

(b) Rate ratio is the age-standardised Indigenous rate divided by the age-standardised non-Indigenous rate.

(c) Rate difference is the age-standardised Indigenous rate minus the age-standardised non-Indigenous rate.

Note: 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Table C5.1: All-cause mortality rates, rate ratios and rate differences, by sex and Indigenous status, NSW, Qld, WA, SA and NT combined, 2001 to 2012

	Indigenous			Non-Indigenous		Rate ratio ^(c)	Rate difference ^(d)
	Number	Crude rate ^(a)	AS rate ^(b)	AS rate ^(b)			
Males							
2001	1,145	483.4	1,285.8	772.1	1.7	513.7	
2002	1,126	464.1	1,217.8	774.4	1.6	443.4	
2003	1,177	474.0	1,214.7	751.4	1.6	463.2	
2004	1,160	456.8	1,196.6	746.2	1.6	450.4	
2005	1,154	444.1	1,078.4	711.1	1.5	367.3	
2006	1,213	456.1	1,186.6	708.2	1.7	478.4	
2007	1,227	451.5	1,152.0	712.8	1.6	439.2	
2008	1,208	435.2	1,129.2	722.3	1.6	406.9	
2009	1,196	421.9	1,047.3	682.4	1.5	364.9	
2010	1,296	447.9	1,111.9	678.7	1.6	433.1	
2011	1,312	445.1	1,152.0	681.6	1.7	470.3	
2012	1,351	448.6	1,117.4	661.4	1.7	456.0	
Annual change 2001–2012^(e)	17.9*	-3.3*	-13.3*	-9.9*	0.0	-3.3	
Per cent change 2001–2012^(e)	17.7*	-7.7*	-11.9*	-14.2*	2.9	-8.0	
Females							
2001	791	332.0	905.3	535.6	1.7	369.8	
2002	920	376.9	967.8	550.7	1.8	417.1	
2003	787	314.9	827.2	538.3	1.5	289.0	
2004	889	347.8	918.8	536.0	1.7	382.8	
2005	874	334.0	854.8	514.3	1.7	340.6	
2006	920	343.5	875.5	519.0	1.7	356.5	
2007	1,016	371.0	926.0	524.8	1.8	401.2	
2008	1,007	359.9	886.4	538.4	1.6	348.0	
2009	1,037	362.9	902.5	509.5	1.8	393.0	
2010	1,015	348.1	856.3	512.7	1.7	343.6	
2011	1,075	361.7	838.9	516.9	1.6	322.1	
2012	1,118	368.9	868.6	508.9	1.7	359.7	
Annual change 2001–2012^(e)	27.4*	2.4	-4.5	-2.9*	0.0	-1.6	
Per cent change 2001–2012^(e)	37.4*	7.7	-5.5	-5.9*	0.5	-4.8	

(continued)

Table C5.1 (continued): All-cause mortality rates, rate ratios and rate differences, by sex and Indigenous status, NSW, Qld, WA, SA and NT combined, 2001 to 2012

	Indigenous			Non-Indigenous	Rate ratio ^(c)	Rate difference ^(d)
	Number	Crude rate ^(a)	AS rate ^(b)	AS rate ^(b)		
Persons						
2001	1,936	407.5	1,083.3	643.5	1.7	439.8
2002	2,046	420.4	1,085.5	652.9	1.7	432.6
2003	1,964	394.2	1,008.0	636.3	1.6	371.7
2004	2,049	402.1	1,047.6	633.0	1.7	414.6
2005	2,028	388.9	963.2	605.6	1.6	357.7
2006	2,133	399.6	1,018.6	606.8	1.7	411.8
2007	2,243	411.0	1,031.5	612.2	1.7	419.3
2008	2,215	397.4	997.9	624.3	1.6	373.6
2009	2,233	392.3	972.8	590.3	1.6	382.5
2010	2,311	397.8	977.1	590.6	1.7	386.5
2011	2,387	403.2	977.0	594.1	1.6	382.8
2012	2,469	408.6	982.6	580.9	1.7	401.7
Annual change 2001–2012^(e)	45.3*	-0.4	-8.9*	-5.9*	0.0	-2.2
Per cent change 2001–2012^(e)	26.0*	-1.2	-9.3*	-10.0*	2.0	-5.8

* Represents results with statistically significant increases or declines at the $p < 0.05$ level over the selected period.

(a) Deaths per 100,000 population.

(b) Rates are directly age-standardised (AS) using the 2001 Australian estimated resident population (based on the 2001 Census), by 5-year age group to 75+. For other data notes, see Appendix B.

(c) Rate ratio is the age-standardised Indigenous rate divided by the age-standardised non-Indigenous rate.

(d) Rate difference is the age-standardised Indigenous rate minus the age-standardised non-Indigenous rate.

(e) Average annual change in rates, rate ratios and rate differences determined using linear regression analysis over the specified period. Per cent change between 2001 and 2012 is based on the average annual change over the specified period.

Note: 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Table C5.2: Infant mortality rates, rate ratios and rate differences, by Indigenous status of infants, NSW, Qld, WA, SA and NT combined, 2001 to 2012

	Indigenous		Non-Indigenous	Rate ratio ^(b)	Rate difference ^(c)
	Number	Crude rate ^(a)	Crude rate ^(a)		
2001	116	11.2	5.0	2.2	6.2
2002	130	12.5	4.4	2.8	8.1
2003	115	10.9	4.0	2.7	6.9
2004	111	10.2	4.3	2.4	6.0
2005	124	10.9	4.4	2.5	6.4
2006	112	9.4	4.3	2.2	5.1
2007	114	8.3	3.9	2.1	4.4
2008	101	7.0	3.9	1.8	3.1
2009	97	6.4	4.0	1.6	2.3
2010	109	6.9	3.9	1.8	3.0
2011	105	6.6	3.6	1.8	3.0
2012	81	5.0	3.3	1.5	1.7
Annual change 2001 to 2012^(d)	-2.8*	-0.6*	-0.1*	-0.1*	-0.5*
Per cent change 2001 to 2012^(d)	-24.3*	-57.0*	-25.6*	-42.0*	-76.4*

*Represents results with statistically significant increases or declines at the $p < 0.05$ level over the selected period.

(a) Deaths per 1,000 live births.

(b) Rate ratio is the mortality rate for Indigenous infants divided by the mortality rate for non-Indigenous infants.

(c) Rate difference is the mortality rate for Indigenous infants minus the mortality rate for non-Indigenous infants.

(d) Average annual change in rates, rate ratios and rate differences determined using linear regression analysis over the specified period. Per cent change between 2001 and 2012 is based on the average annual change over the specified period.

Notes

1. 'Indigenous' infants are infants whose mother and/or father were Indigenous.

2. 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Table C5.3: Percentage decline in mortality rates, by age and Indigenous status, NSW, Qld, WA, SA and NT combined, 2001 to 2012^(a)

Age group (years)	Indigenous	Non-Indigenous
0–4	27.3*	23.0*
5–14	1.2	27.2*
15–24	18.4	35.4*
25–34	30.5*	25.9*
35–44	12.9	15.1*
45–54	13.0*	9.0*
55–64	23.9*	19.5*
65–74	17.3*	28.8*
75+	-3.2	2.1

* Represents results with statistically significant declines at the $p < 0.05$ level over the selected period.

(a) Percentage decline between 2001 and 2012 is based on the average annual change over the specified period. Average annual change in rates determined using linear regression analysis over the specified period.

Note: 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Table C5.4: Indigenous all-cause age-standardised mortality rates^(a), by jurisdiction, NSW, Qld, WA, SA and NT, 2001 to 2012

	NSW	Qld	WA	SA	NT	Total
2001	851.5	1,047.6	1,440.2	898.4	1,662.4	1,083.3
2002	832.2	1,105.7	1,489.5	707.5	1,664.2	1,085.5
2003	753.6	1,057.0	1,235.3	841.4	1,565.5	1,008.0
2004	749.0	1,025.8	1,649.1	847.1	1,544.7	1,047.6
2005	774.6	853.1	1,414.6	796.6	1,442.2	963.2
2006	751.0	972.0	1,519.3	769.7	1,549.3	1,018.6
2007	807.0	976.9	1,440.1	835.3	1,538.0	1,031.5
2008	765.7	915.2	1,415.3	804.2	1,600.2	997.9
2009	767.7	996.2	1,251.7	820.4	1,399.6	972.8
2010	775.6	958.6	1,234.8	894.2	1,422.6	977.1
2011	886.4	890.1	1,235.1	715.4	1,360.1	977.0
2012	736.2	979.4	1,324.3	811.1	1,534.8	982.6
Annual change 2001–2012^(b)	-1.8	-11.7*	-19.7	-2.0	-18.9*	-8.9*
Per cent change 2001–2012^(b)	-2.4	-12.3*	-14.5	-2.6	-12.8*	-9.3*

* Represents results with statistically significant increases or declines at the $p < 0.05$ level over the selected period.

(a) Rates (deaths per 100,000 population) are directly age-standardised using the 2001 Australian estimated resident population (based on the 2001 Census), by 5-year age group to 75+. For other data notes, see Appendix B.

(b) Average annual change in rates determined using linear regression analysis over the specified period. Per cent change between 2001 and 2012 is based on the average annual change over the specified period.

Note: 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Table C5.5: Age-standardised mortality rates^(a) for circulatory diseases (ICD-10 codes I00–I99), by sex and Indigenous status, NSW, Qld, WA, SA and NT combined, 2001 to 2012

	Males			Females			Persons		
	Indigenous	Non-Indigenous	Rate difference ^(b)	Indigenous	Non-Indigenous	Rate difference ^(b)	Indigenous	Non-Indigenous	Rate difference ^(b)
2001	470.1	282.1	187.9	313.1	222.2	90.9	386.5	250.8	135.8
2002	438.1	278.3	159.8	345.8	220.1	125.7	388.7	248.0	140.6
2003	405.4	268.1	137.3	300.7	210.6	90.2	351.6	237.9	113.8
2004	407.0	259.2	147.9	295.6	204.6	91.0	346.4	230.8	115.6
2005	334.9	239.4	95.5	297.1	193.3	103.9	318.8	215.6	103.2
2006	371.4	233.3	138.0	273.6	191.3	82.3	318.6	211.8	106.8
2007	360.1	230.9	129.2	317.6	189.9	127.7	339.7	209.9	129.8
2008	318.1	231.3	86.8	264.7	196.1	68.6	291.5	213.6	77.9
2009	328.0	212.4	115.5	260.7	177.7	83.0	292.4	194.9	97.5
2010	332.9	204.6	128.3	241.2	173.2	68.0	283.1	188.8	94.3
2011	331.3	203.6	127.7	226.4	170.6	55.8	273.1	186.9	86.1
2012	335.2	189.1	146.1	241.4	160.4	80.9	282.9	174.8	108.1
Annual change 2001–2012^(c)	-11.9*	-8.4*	-3.5	-8.8*	-5.3*	-3.5*	-10.5*	-6.7*	-3.8*
Per cent change 2001–2012^(c)	-30.1*	-32.7*	-25.4	-29.3*	-26.3*	-35.4*	-30.2*	-39.4*	-31.8*

* Represents results with statistically significant increases or declines at the $p < 0.05$ level over the selected period.

(a) Rates (deaths per 100,000 population) are directly age-standardised using the 2001 Australian estimated resident population (based on the 2001 Census), by 5-year age group to 75+. For other data notes, see Appendix B.

(b) Rate difference is the age-standardised mortality rate for Indigenous Australians minus the age-standardised mortality rate for non-Indigenous Australians.

(c) Average annual change in rates and rate differences determined using linear regression analysis over the specified period. Per cent change between 2001 and 2012 is based on the average annual change over the specified period.

Note: 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Table C5.6: Age-standardised mortality rates^(a) for respiratory diseases (ICD-10 codes J00–J99), by sex and Indigenous status, NSW, Qld, WA, SA and NT combined, 2001 to 2012

	Males			Females			Persons		
	Indigenous	Non-Indigenous	Rate difference ^(b)	Indigenous	Non-Indigenous	Rate difference ^(b)	Indigenous	Non-Indigenous	Rate difference ^(b)
2001	172.6	67.7	104.9	96.6	42.3	54.3	131.0	52.9	78.1
2002	149.7	72.6	77.1	90.3	46.3	44.0	116.7	57.4	59.3
2003	138.1	71.5	66.6	76.1	48.1	28.0	103.0	58.0	45.0
2004	121.6	68.1	53.6	113.4	47.3	66.2	117.8	56.1	61.7
2005	107.0	63.2	43.8	76.2	41.7	34.4	90.0	50.9	39.1
2006	134.2	62.0	72.2	77.7	41.0	36.6	102.6	50.0	52.6
2007	115.4	63.6	51.8	98.9	43.1	55.9	106.3	52.0	54.3
2008	110.6	59.6	51.0	62.1	40.7	21.4	82.4	48.9	33.5
2009	104.0	57.2	46.8	87.3	38.4	48.9	94.3	46.5	47.7
2010	112.8	59.4	53.4	92.7	41.7	51.0	101.8	49.4	52.3
2011	121.0	61.2	59.8	85.2	42.6	42.7	99.8	50.7	49.1
2012	109.1	62.0	47.1	91.3	45.1	46.3	98.7	52.5	46.2
Annual change 2001–2012^(c)	-4.3*	-1.1*	-3.2*	-0.5	-0.3	-0.2	-2.3*	-0.6*	-1.7
Per cent change 2001–2012^(c)	-31.9*	-17.2*	-45.0*	-5.9	-8.0	-3.9	-21.6*	-12.3*	-30.1

* Represents results with statistically significant increases or declines at the $p < 0.05$ level over the selected period.

(a) Rates (deaths per 100,000 population) are directly age-standardised using the 2001 Australian estimated resident population (based on the 2001 Census), by 5-year age group to 75+. For other data notes, see Appendix B.

(b) Rate difference is the age-standardised mortality rate for Indigenous Australians minus the age-standardised mortality rate for non-Indigenous Australians.

(c) Average annual change in rates and rate differences determined using linear regression analysis over the specified period. Per cent change between 2001 and 2012 is based on the average annual change over the specified period.

Note: 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Table C5.7: Age-standardised mortality rates^(a) for cancer (ICD-10 codes C00–D48), by sex and Indigenous status, NSW, Qld, WA, SA and NT combined, 2001 to 2012

	Males			Females			Persons		
	Indigenous	Non-Indigenous	Rate difference ^(b)	Indigenous	Non-Indigenous	Rate difference ^(b)	Indigenous	Non-Indigenous	Rate difference ^(b)
2001	239.0	242.7	-3.7	189.3	146.5	42.9	211.8	188.1	23.7
2002	213.8	237.4	-23.6	170.0	150.5	19.5	189.8	187.9	1.9
2003	261.0	232.8	28.2	156.2	147.7	8.5	202.4	184.9	17.5
2004	223.6	235.1	-11.5	182.1	148.4	33.7	200.7	186.4	14.3
2005	208.8	232.1	-23.4	166.0	145.4	20.6	185.2	183.6	1.5
2006	233.2	228.9	4.2	184.8	144.2	40.6	206.3	181.5	24.8
2007	249.4	226.0	23.4	175.8	141.4	34.4	208.2	178.8	29.4
2008	236.5	231.6	4.9	209.0	146.0	63.0	220.9	183.9	37.0
2009	243.4	222.0	21.5	180.7	142.4	38.3	207.6	177.6	30.1
2010	244.5	225.3	19.2	201.2	142.4	58.8	221.3	179.3	42.0
2011	297.6	220.9	76.6	193.0	140.6	52.3	236.3	176.4	59.9
2012	261.4	214.1	47.2	198.7	137.5	61.2	226.9	171.7	55.2
Annual change 2001–2012^(c)	3.8	-2.0*	5.8*	2.6*	-0.9*	3.5*	3.0*	-1.3*	4.3*
Per cent change 2001–2012^(c)	18.8	-9.4*	347.1*	16.7*	-6.6*	36.7^(d)	17.1*	-7.5*	118.7^(d)

* Represents results with statistically significant increases or declines at the $p < 0.05$ level over the selected period.

- (a) Rates (deaths per 100,000 population) are directly age-standardised using the 2001 Australian estimated resident population (based on the 2001 Census), by 5-year age group to 75+. For other data notes, see Appendix B.
- (b) Rate difference is the age-standardised mortality rate for Indigenous Australians minus the age-standardised mortality rate for non-Indigenous Australians.
- (c) Average annual change in rates and rate differences determined using linear regression analysis over the specified period. Per cent change between 2001 and 2012 is based on the average annual change over the specified period.
- (d) Due to the high level of volatility in this series (which is due to small numbers of deaths) the standard per cent change calculations return implausible values, therefore per cent change has been based on the actual start point of the series (2001 value) rather than the value derived from the linear trend line.

Note: 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Table C5.8: Age-standardised mortality rates^(a) for external causes (ICD-10 codes V00–Y98), by sex and Indigenous status, NSW, Qld, WA, SA and NT combined, 2001 to 2012

	Males			Females			Persons		
	Indigenous	Non-Indigenous	Rate difference ^(b)	Indigenous	Non-Indigenous	Rate difference ^(b)	Indigenous	Non-Indigenous	Rate difference ^(b)
2001	114.9	57.4	57.5	44.7	22.4	22.3	78.7	39.7	38.9
2002	101.9	55.0	46.9	51.8	22.4	29.3	76.3	38.6	37.8
2003	105.8	54.1	51.7	49.4	22.2	27.2	77.4	37.9	39.5
2004	104.4	52.5	51.9	42.5	22.5	20.0	71.5	37.3	34.2
2005	124.5	51.9	72.6	47.0	21.6	25.4	83.1	36.6	46.5
2006	106.7	52.7	54.1	43.7	21.1	22.6	73.7	36.6	37.0
2007	109.2	52.4	56.8	44.4	24.2	20.1	75.2	38.1	37.1
2008	113.6	54.2	59.4	55.8	23.5	32.3	83.4	38.7	44.7
2009	87.4	53.1	34.3	46.0	22.9	23.1	66.2	37.8	28.4
2010	101.7	52.3	49.4	39.4	23.8	15.5	69.7	38.0	31.7
2011	107.1	51.2	55.9	51.1	24.8	26.3	78.7	37.9	40.8
2012	98.9	52.5	46.4	56.3	24.6	31.7	77.2	38.4	38.9
Annual change 2001–2012^(c)	-1.0	-0.3	-0.6	0.3	0.2	0.1	-0.3	0.0	-0.2
Per cent change 2001–2012^(c)	-9.4	-6.4*	-12.3	8.1	12.2*	4.4	-3.6	-1.1	-6.1

* Represents results with statistically significant increases or declines at the $p < 0.05$ level over the selected period.

- (a) Rates (deaths per 100,000 population) are directly age-standardised using the 2001 Australian estimated resident population (based on the 2001 Census), by 5-year age group to 75+. For other data notes, see Appendix B.
- (b) Rate difference is the age-standardised mortality rate for Indigenous Australians minus the age-standardised mortality rate for non-Indigenous Australians.
- (c) Average annual change in rates and rate differences determined using linear regression analysis over the specified period. Per cent change between 2001 and 2012 is based on the average annual change over the specified period.

Note: 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Table C5.9: Age-standardised mortality rates^(a) for kidney diseases (ICD-10 codes N00–N29), by sex and Indigenous status, NSW, Qld, WA, SA and NT combined, 2001 to 2012

	Males			Females			Persons		
	Indigenous	Non-Indigenous	Rate difference ^(b)	Indigenous	Non-Indigenous	Rate difference ^(b)	Indigenous	Non-Indigenous	Rate difference ^(b)
2001	14.7	11.3	3.4	21.8	8.8	13.0	18.5	9.8	8.7
2002	19.6	12.0	7.6	30.3	9.4	20.9	25.6	10.4	15.2
2003	23.6	11.4	12.1	25.8	9.5	16.3	24.9	10.3	14.6
2004	17.7	11.4	6.3	30.4	8.7	21.7	24.8	9.8	15.0
2005	24.9	10.8	14.0	21.2	9.3	12.0	22.6	9.9	12.7
2006	55.8	12.5	43.3	35.5	9.2	26.3	43.8	10.6	33.2
2007	32.5	13.4	19.1	30.0	11.3	18.7	31.2	12.2	19.0
2008	38.8	13.9	24.8	32.1	11.4	20.6	34.8	12.5	22.3
2009	26.4	12.8	13.6	37.2	11.1	26.1	33.1	11.9	21.2
2010	26.6	11.3	15.3	36.4	9.8	26.6	32.4	10.5	22.0
2011	22.9	12.0	10.9	24.9	9.2	15.8	23.9	10.4	13.5
2012	30.3	11.9	18.5	20.2	10.1	10.1	24.6	10.9	13.7
Annual change 2001–2012^(c)	1.0	0.1	0.9	0.2	0.1	0.1	0.6	0.1	0.5
Per cent change 2001–2012^(c)	49.3	7.5	94.7	9.8	14.9	7.2	26.1	12.6	35.2

* Represents results with statistically significant increases or declines at the $p < 0.05$ level over the selected period.

- (a) Rates (deaths per 100,000 population) are directly age-standardised using the 2001 Australian estimated resident population (based on the 2001 Census), by 5-year age group to 75+. For other data notes, see Appendix B.
- (b) Rate difference is the age-standardised mortality rate for Indigenous Australians minus the age-standardised mortality rate for non-Indigenous Australians.
- (c) Average annual change in rates and rate differences determined using linear regression analysis over the specified period. Per cent change between 2001 and 2012 is based on the average annual change over the specified period.

Note: 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

Table C5.10: Age-standardised mortality rates^(a) for diabetes mellitus (ICD-10 codes E10-E14), by sex and Indigenous status, NSW, Qld, WA, SA and NT combined, 2001 to 2012

	Males			Females			Persons		
	Indigenous	Non-Indigenous	Rate difference ^(b)	Indigenous	Non-Indigenous	Rate difference ^(b)	Indigenous	Non-Indigenous	Rate difference ^(b)
2001	74.7	17.0	57.8	97.8	10.2	87.6	87.3	13.2	74.0
2002	94.0	17.6	76.4	102.7	11.4	91.3	99.6	14.1	85.5
2003	72.6	16.8	55.7	79.5	11.5	67.9	76.8	14.0	62.8
2004	106.7	18.2	88.5	92.7	12.2	80.5	99.1	14.9	84.2
2005	77.8	16.4	61.4	80.0	12.2	67.8	79.5	14.2	65.3
2006	98.1	16.6	81.5	89.1	12.6	76.5	93.3	14.4	78.8
2007	80.4	18.2	62.2	81.0	12.9	68.1	80.7	15.4	65.3
2008	96.7	20.0	76.8	102.0	14.0	88.0	99.6	16.8	82.9
2009	78.3	18.8	59.5	96.3	13.4	82.9	88.6	15.9	72.7
2010	82.2	16.8	65.4	78.2	12.6	65.6	80.6	14.6	66.1
2011	97.0	17.9	79.0	77.9	13.3	64.6	85.8	15.5	70.4
2012	94.5	18.1	76.3	91.5	12.8	78.7	92.7	15.3	77.5
Annual change 2001–2012^(c)	0.7	0.1	0.6	-0.8	0.2*	-1.0	-0.1	0.2*	-0.3
Per cent change 2001–2012^(c)	9.6	7.1	10.3	-9.2	22.5*	-13.6	-1.8	14.5*	-4.8

* Represents results with statistically significant increases or declines at the $p < 0.05$ level over the selected period.

(a) Rates (deaths per 100,000 population) are directly age-standardised using the 2001 Australian estimated resident population (based on the 2001 Census), by 5-year age group to 75+. For other data notes, see Appendix B.

(b) Rate difference is the age-standardised mortality rate for Indigenous Australians minus the age-standardised mortality rate for non-Indigenous Australians.

(c) Average annual change in rates and rate differences determined using linear regression analysis over the specified period. Per cent change between 2001 and 2012 is based on the average annual change over the specified period.

Note: 2011 and 2012 data are revised and preliminary, respectively, and subject to revision by the ABS.

Source: AIHW National Mortality Database (last updated on 29 May 2014).

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This report provides an overview of current patterns and trends in mortality and life expectancy among Aboriginal and Torres Strait Islander people. Circulatory diseases were the leading cause of death of Indigenous Australians for the period 2008–2012 (representing 26% of Indigenous deaths), followed by cancer (20%) and external causes (15%). There have been significant declines in overall Indigenous mortality rates as well as mortality rates from circulatory diseases and respiratory diseases between 2001 and 2012. However, there has been little improvement in Indigenous mortality from other causes such as cancer and external causes over this period.