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Australian Burden of Disease Study

Impact and causes
of illness and death
in Aboriginal and
Torres Strait
Islander people
2018

Summary
report




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In 2018, Indigenous Australians lost 240,000 years of healthy life (total burden, DALY) due to:

Living with illness or injury (non-fatal)
53% of total burden

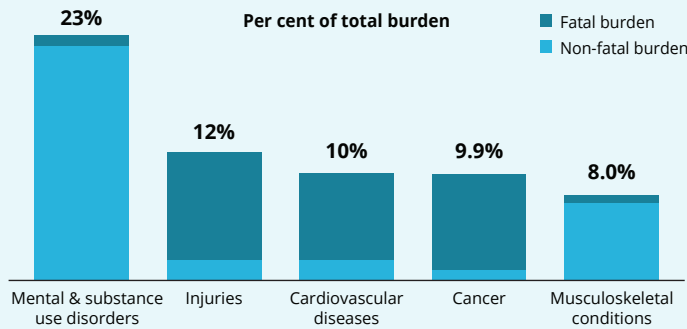


Dying prematurely (fatal)
47% of total burden



Chronic diseases and injuries accounted for most of the burden

The leading 5 disease groups causing total burden:

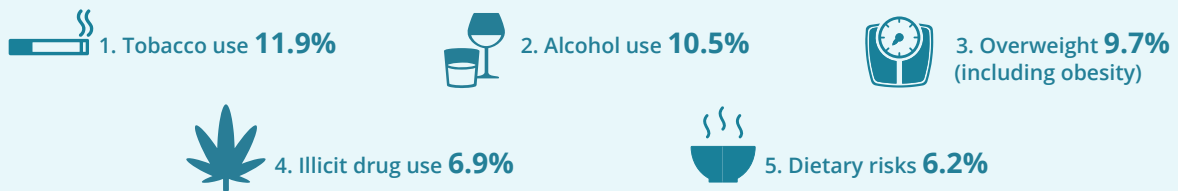


The leading 5 diseases contributing to total burden (% of total DALY) among Indigenous Australians in 2018 were:

1. Coronary heart disease 5.8%
2. Anxiety disorders 5.3%
3. Suicide & self-inflicted injuries 4.6%
4. Alcohol use disorders 4.4%
5. Depressive disorders 4.3%

Exposure to risk factors contributed 49% of the total burden

The 5 risk factors contributing the most burden were:



There were substantial improvements in burden rates between 2003 and 2018 with:



Biggest absolute reduction in burden (DALY rate) came from:

- Cardiovascular diseases (down 44%)
- Endocrine disorders (including diabetes) (down 44%)



Biggest absolute increase in burden (DALY rate) came from:

- Mental & substance use disorders (up 21%)



The gap in burden between Indigenous and non-Indigenous Australians narrowed between 2003 and 2018 with:



The leading disease groups contributing to the gap in 2018 were:

1. Mental & substance use disorders 20%
2. Cardiovascular diseases 14%
3. Injuries 10%
4. Respiratory diseases 9.6%
5. Cancers 9.4%



What is burden of disease and why is it important?

Burden of disease analysis measures the impact of disease and injury in a population by estimating the amount of 'disability-adjusted life years' (DALY) experienced by that population. This measure counts the combined years of healthy life lost due to living with and dying prematurely from disease and injury. Burden of disease in Australia is measured for 219 diseases and injuries (grouped into 17 disease groups). Rather than just counting deaths and disease prevalence, it takes into account the age at death and severity of disease to estimate the total health loss. The contribution of various modifiable risk factors to disease burden is also estimated.

Information on the burden of disease and injuries as well as the contribution of various risk factors to burden is important for monitoring population health and for providing an evidence base to inform health policy and service planning.

Australian Burden of Disease Study 2018

The ABDS 2018 is based on the Australian Institute of Health and Welfare's previous burden of disease studies and provides an update of the Australian-specific burden of disease estimates for both the Australian and Indigenous Australian populations. This new study provides estimates of burden in Indigenous Australians for the reference year 2018, and recalculations of the 2011 and 2003 estimates using new data sources and methods, where applicable. This report is a summary of the ABDS 2018 findings for Indigenous Australians. More detailed information can be found in the detailed report, the methods report and the interactive data visualisations, all available on the AIHW website at www.aihw.gov.au/burden-of-disease.

Several key improvements were adopted for the ABDS 2018 compared with the ABDS 2011 (the last time estimates for the Indigenous Australian population were produced). Among these improvements were: a more comprehensive list of diseases and risk factors of relevance in Australia, new conceptual models for some diseases, and the estimation of a new measure – the health-adjusted life expectancy (HALE). See Chapter 1 and Appendix A of [Australian Burden of Disease Study: impact and causes of illness and death in Aboriginal and Torres Strait Islander people 2018](#) for more information on improvements between ABDS 2011 and ABDS 2018.

Burden of disease summary measures

Years lived with disability (YLD): A measure of the years spent in less than full health due to living with illness due to disease and injury, weighted to account for severity of disease. YLD represent non-fatal burden.

Years of life lost (YLL): A measure of the years of life lost due to premature death, defined as dying before the ideal life span. YLL represent fatal burden.

Disability-adjusted life years (DALY): A measure (in years) of healthy life lost either through living with illness due to disease and injury (YLD) or through dying prematurely (YLL). The DALY measure represents total burden (the sum of YLD and YLL) and can be referred to as health loss.

Each of these 3 measures can be expressed as the number of YLD/YLL/DALY in a population, or as a crude or age-standardised rate.

Attributable burden: The disease burden attributed to a particular risk factor. It is the reduction in fatal and non-fatal burden that would have occurred if exposure to the risk factor had been minimised or avoided. It can be expressed as the number of attributable YLL/YLD/DALY in a population, a proportion of total disease burden attributable to the risk factor, or as a crude or age-standardised rate.

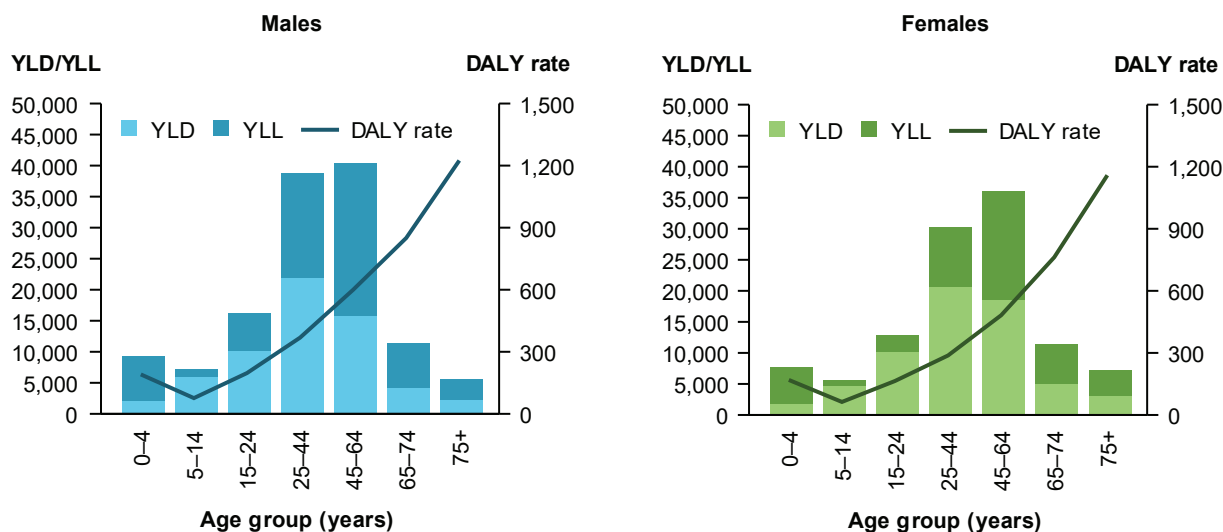
Health-adjusted life expectancy (HALE): The number of years a person at a specific age could, on average, expect to live in full health (without disease or injury). It can be measured at any age but is typically reported at birth (which represents the average health-adjusted life expectancy for a baby born that year) and at age 65, describing health in an ageing population.

Total burden across the life course

In 2018 Indigenous Australians lost 239,942 years of healthy life due to living with or dying prematurely from disease and injury (total burden, DALY), which equates to around 289 DALY for every 1,000 Indigenous Australians. This burden was split between 113,445 years of life lost due to premature death (YLL) and 126,496 years lived with disease or injury (YLD) (47% fatal, 53% non-fatal burden).

- Total burden of disease (number of DALY) was greatest in Indigenous adults aged 45–64.
- Indigenous males experienced more total burden (DALY) than Indigenous females for all age groups up to age 64. Higher DALY counts for Indigenous females aged 65 and over were driven by the greater number of Indigenous women still alive in these age groups compared to Indigenous men.
- The DALY rate was higher in the 0–4 age group than among older children, due to a relatively large number of YLL resulting from deaths in infancy. The rate then increased with age in both sexes, but was higher among males than females in all age groups.
- Most (83%) of the burden among Indigenous children aged 5–14 resulted from living with illness (YLD), as did around two-thirds (64%) of the burden among people aged 15–44. For Indigenous Australians aged 45 and over, over half (56%) of the total burden was due to premature death (YLL).

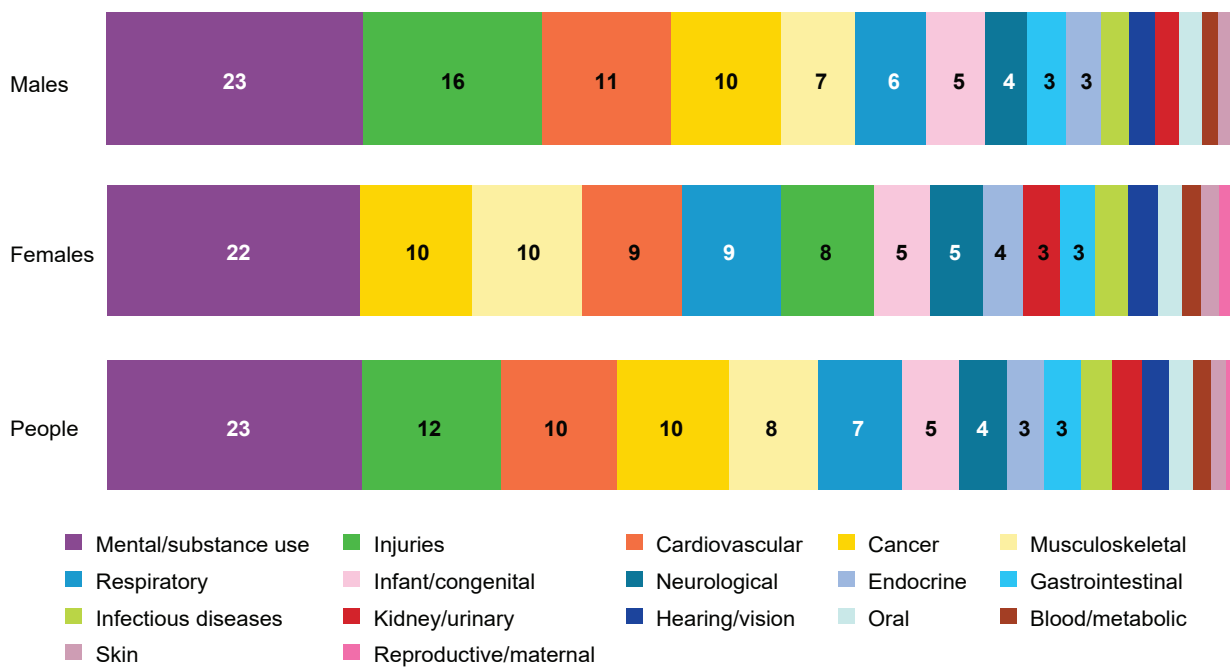
Figure 1: Non-fatal (YLD) and fatal (YLL) composition of the total burden (DALY), and DALY rates (per 1,000 people), by sex and age group, Indigenous Australians, 2018



Chronic diseases and injuries dominate

- The disease group causing the most total burden (DALY) among Indigenous Australians in 2018 was mental & substance use disorders (23% of the total burden), followed by injuries (12%), cardiovascular diseases (10%), cancer (9.9%) and musculoskeletal conditions (8.0%) (Figure 2). Together, these 5 disease groups accounted for almost two-thirds (63%) of the total burden in Indigenous Australians.
- Mental & substance use disorders was the greatest contributor to total burden for both Indigenous males and females, accounting for over one-fifth of the total in both sexes. The leading individual causes of mental & substance use burden were anxiety disorders (23% of total mental & substance use burden), alcohol use disorders (19%) and depressive disorders (19%).
- Injuries were responsible for a higher proportion of the total burden in Indigenous males (16%) than in Indigenous females (8.3%) (Figure 2). The leading individual causes of injuries burden were suicide & self-inflicted injuries (37% of total injuries burden), poisoning (such as the toxic effects of medicinal or other substances) (17%), road traffic injuries (motor vehicle occupants) (12%) and homicide & violence (10%).
- At the individual disease level, the leading 5 causes of total burden were coronary heart disease (5.8% of total burden), anxiety disorders (5.3%), suicide & self-inflicted injuries (4.6%), alcohol use disorders (4.4%) and depressive disorders (4.3%).

Figure 2: Proportion (%) of total burden (DALY), by disease group and sex, Indigenous Australians, 2018

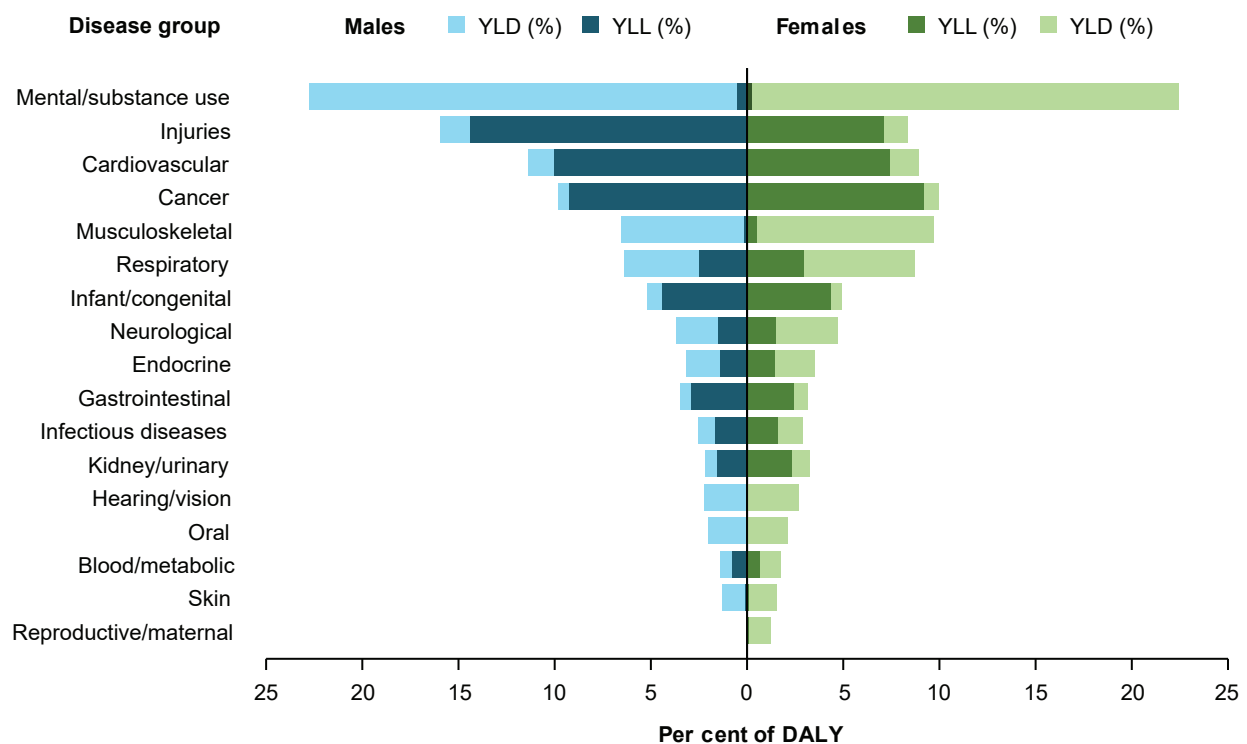


Note: Per cent labels are not shown for disease groups contributing less than 3% of burden.

Disease groups had different proportions of fatal and non-fatal burden

- Among the 5 disease groups causing the most total burden (DALY):
 - mental & substance use disorders and musculoskeletal conditions caused mainly non-fatal burden (YLD)
 - injuries, cardiovascular diseases and cancer caused mainly fatal burden (YLL).
- For other disease groups:
 - the burden from infant & congenital conditions, infectious diseases, gastrointestinal disorders and kidney & urinary diseases was mostly fatal
 - the burden from respiratory diseases, neurological conditions, reproductive & maternal conditions, skin disorders and oral disorders was mostly non-fatal
 - the burden from blood & metabolic disorders and endocrine disorders (including diabetes) was split fairly evenly between fatal and non-fatal
 - the burden from hearing & vision disorders was exclusively non-fatal (Figure 3).

Figure 3: Non-fatal (YLD) and fatal (YLL) burden as a proportion (%) of total burden (DALY), by disease group and sex, Indigenous Australians, 2018



Diseases that caused the most burden across the life course

Indigenous Australians at various stages of life experienced health loss from different diseases and injuries. The patterns of disease group and individual disease burden across the life course are briefly described below, with Figure 4 showing the leading 5 causes of total burden for Indigenous males and females in 7 different age groups.

- Infant & congenital conditions accounted for over half (58%) of the total burden among Indigenous infants and children aged under 5, mostly due to pre-term/low birthweight complications, birth trauma & asphyxia and sudden infant death syndrome (SIDS).
- Mental & substance use disorders was the leading disease group contributor of total burden for Indigenous Australians aged 5–44, with anxiety and depressive disorders appearing among the top 5 individual causes of burden for both Indigenous males and females aged 5–14, 15–24 and 25–44.
- Injuries was the second leading disease group contributor of total burden (DALY) for Indigenous Australians aged 5–44, although injuries caused more burden in Indigenous males than Indigenous females. Suicide & self-inflicted injuries were among the top 5 diseases for both males and females aged 15–24, while RTI/motor vehicle occupant and poisoning were among the top 5 diseases for males aged 15–24 and 25–44.

- Cancer and cardiovascular diseases were the first and second leading disease group contributors of total burden among Indigenous Australians aged 45 and over, each accounting for around one-fifth of the total burden (18% and 16% of DALY, respectively).
- Coronary heart disease, COPD, type 2 diabetes, lung cancer and chronic kidney disease were the leading individual causes of total burden among Indigenous Australians aged 45 and over (accounting for 10%, 6.8%, 5.1%, 5.0% and 4.5% of DALY, respectively).

Figure 4: Leading causes of total burden (DALY; proportion of total %), by sex and age group, Indigenous Australians, 2018

		Age group (years)						
		Under 5	5–14	15–24	25–44	45–64	65–74	75+
Males	1st	Pre-term/lbw complications (1,784; 19%)	Conduct disorder (1,127; 16%)	Suicide/self-inflicted injuries (3,200; 20%)	Alcohol use disorders (4,656; 12%)	Coronary heart disease (5,270; 13%)	Coronary heart disease (1,322; 12%)	Dementia (611; 11%)
	2nd	Birth trauma/asphyxia (635; 6.9%)	Anxiety disorders (899; 13%)	Alcohol use disorders (1,996; 12%)	Suicide/self-inflicted injuries (4,022; 10%)	COPD (2,211; 5.5%)	COPD (1,026; 9.1%)	COPD (570; 10%)
	3rd	Protein-energy deficiency (557; 6.0%)	Asthma (662; 9.3%)	Anxiety disorders (851; 5.2%)	Anxiety disorders (2,209; 5.7%)	Lung cancer (2,038; 5.0%)	Lung cancer (760; 6.7%)	Coronary heart disease (510; 9.2%)
	4th	SIDS (475; 5.1%)	ADHD (366; 5.1%)	RTI/motor vehicle occupant (802; 4.9%)	Poisoning (2,102; 5.4%)	Chronic liver disease (1,923; 4.8%)	Type 2 diabetes (678; 6.0%)	Lung cancer (260; 4.7%)
	5th	Other unintentional injuries (405; 4.4%)	Depressive disorders (344; 4.8%)	Depressive disorders (794; 4.9%)	Depressive disorders (2,078; 5.4%)	Type 2 diabetes (1,844; 4.6%)	Chronic kidney disease (571; 5.0%)	Type 2 diabetes (252; 4.5%)
		Infant/congenital	Blood/metabolic	Injuries	Mental/substance use	Respiratory	Cardiovascular	
		Cancer	Gastrointestinal	Endocrine	Kidney/urinary	Neurological		
Females	1st	Pre-term/lbw complications (1,179; 15%)	Anxiety disorders (738; 13%)	Anxiety disorders (1,612; 13%)	Anxiety disorders (3,342; 11%)	Coronary heart disease (2,574; 7.1%)	COPD (1,097; 9.7%)	Dementia (971; 13%)
	2nd	Birth trauma/asphyxia (869; 11%)	Conduct disorder (684; 12%)	Suicide/self-inflicted injuries (1,381; 11%)	Depressive disorders (2,757; 9.1%)	COPD (2,150; 6.0%)	Coronary heart disease (919; 8.1%)	Coronary heart disease (603; 8.3%)
	3rd	Protein-energy deficiency (533; 6.9%)	Depressive disorders (458; 8.1%)	Depressive disorders (1,265; 9.8%)	Asthma (1,483; 4.9%)	Type 2 diabetes (1,933; 5.4%)	Chronic kidney disease (783; 6.9%)	COPD (546; 7.5%)
	4th	Cardiovascular defects (436; 5.6%)	Asthma (458; 8.1%)	Alcohol use disorders (879; 6.8%)	Back pain and problems (1,298; 4.3%)	Chronic kidney disease (1,785; 5.0%)	Lung cancer (722; 6.4%)	Chronic kidney disease (407; 5.6%)
	5th	SIDS (434; 5.6%)	Back pain and problems (323; 5.7%)	Drug use disorders (605; 4.7%)	Alcohol use disorders (1,118; 3.7%)	Anxiety disorders (1,654; 4.6%)	Type 2 diabetes (631; 5.6%)	Rheumatoid arthritis (402; 5.5%)
		Infant/congenital	Blood/metabolic	Mental/substance use	Respiratory	Musculoskeletal	Injuries	
		Cardiovascular	Endocrine	Kidney/urinary	Cancer	Neurological		

lbw = low birthweight; RTI = road traffic injuries; SIDS = sudden infant death syndrome, COPD = chronic obstructive pulmonary disease.
 Note: Disease rankings exclude 'other' residual conditions from each disease group; for example, 'other musculoskeletal conditions'.

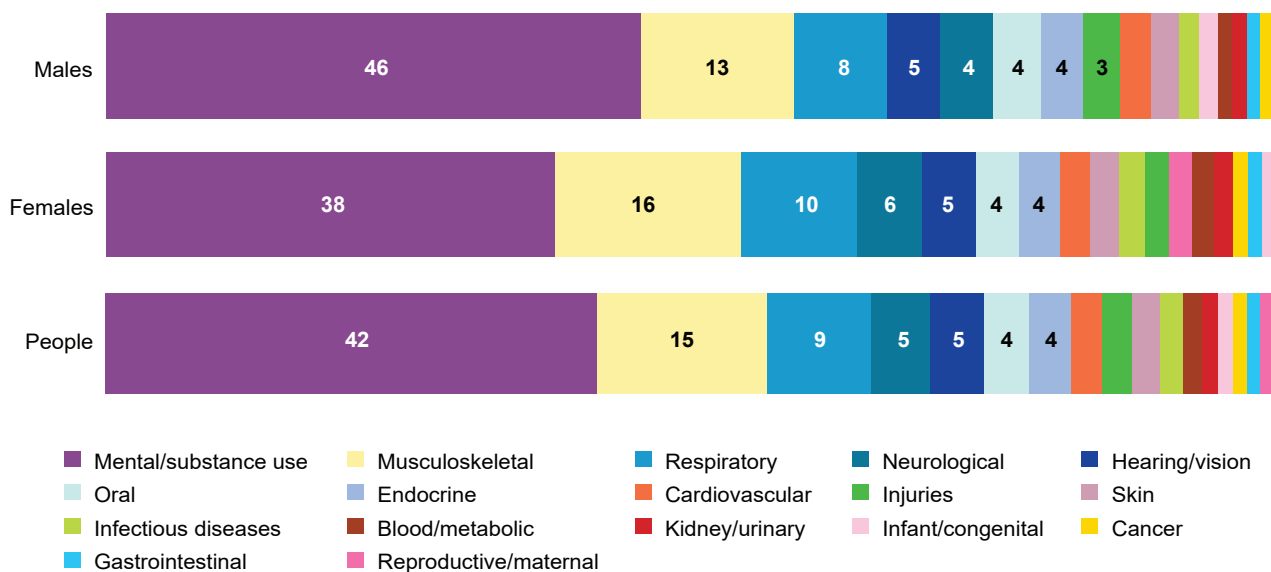
Impact of living with disease and injury

- In 2018, Indigenous Australians lost 126,496 years of healthy life due to the impact of living with disease and injury (non-fatal burden, YLD). This accounted for more than half (53%) of the total burden (DALY).
- Indigenous males and females experienced similar rates of non-fatal burden (number of YLD per 1,000 people) throughout the life course, which was lowest in infants and children and generally increased with age.

Mental & substance use disorders were the main causes of non-fatal burden

- Mental & substance use disorders accounted for 46% of the non-fatal burden in Indigenous males and 38% in females (Figure 5).
- Musculoskeletal conditions, respiratory diseases, neurological conditions and hearing & vision disorders were the other main disease groups contributing to non-fatal burden. Together, they accounted for 30% of non-fatal burden in males and 36% in females.

Figure 5: Proportion (%) of non-fatal burden (YLD), by disease group and sex, Indigenous Australians, 2018



Note: Per cent labels are not shown for disease groups contributing less than 3% of burden.

- At the individual disease level, the leading 5 diseases causing non-fatal burden for Indigenous Australians were anxiety disorders (10% of non-fatal burden), depressive disorders (8.1%), alcohol use disorders (7.8%), asthma (5.7%) and back pain & problems (5.5%).
- Compared with Indigenous females, Indigenous males experienced more non-fatal burden from substance use disorders (alcohol and drug use) and schizophrenia, while females experienced more non-fatal burden from anxiety, depressive disorders, asthma and osteoarthritis.

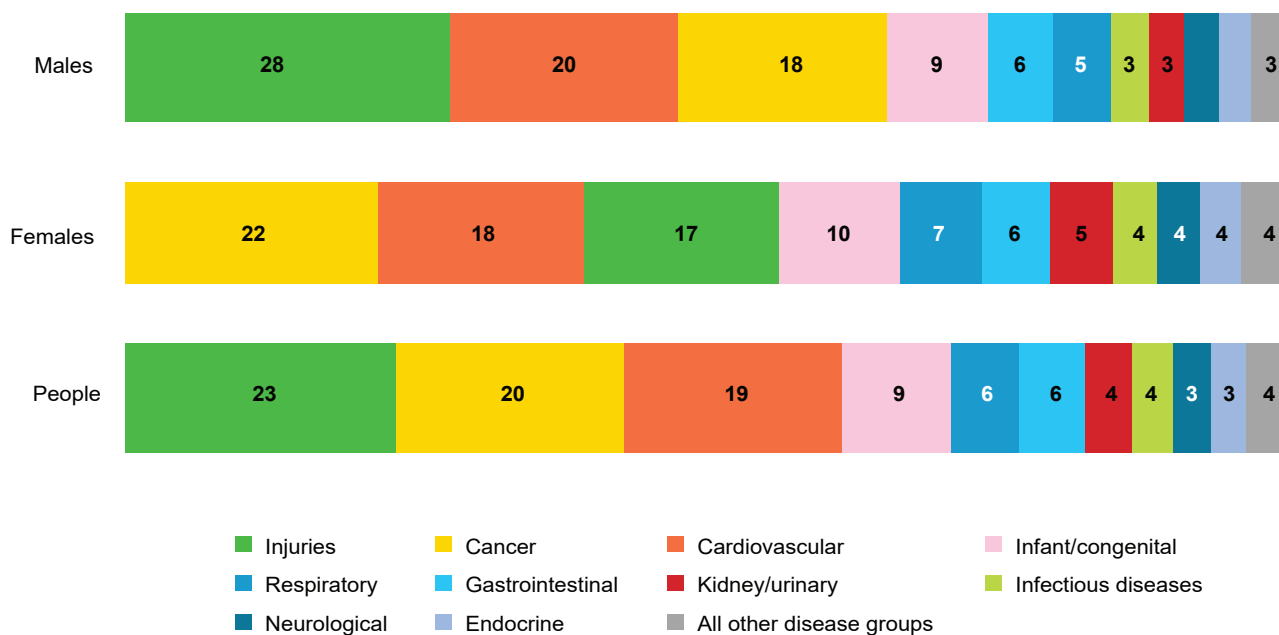
Impact of dying prematurely

- In 2018, there were an estimated 3,619 deaths of Indigenous Australians, which resulted in 113,445 YLL (fatal burden). Fatal burden accounted for 47% of the total burden of disease.
- Indigenous males experienced more fatal burden than Indigenous females (58% compared with 42%). After adjusting for differences in age, the fatal burden rate was 43% higher in males (238 YLL per 1,000 people) than in females (166 YLL per 1,000).
- The majority (59%) of Indigenous deaths in 2018 occurred before age 65. This is in stark contrast to the non-Indigenous population, where only 17% of deaths occurred before this age.

Injuries, cancer and cardiovascular diseases caused most of the fatal burden

- Injuries (28% for males; 17% for females), cancer (18% for males; 22% for females) and cardiovascular diseases (20% for males; 18% for females) caused most of the fatal burden for Indigenous Australians in 2018 (Figure 6).
- Other disease groups that contributed substantially to fatal burden were infant & congenital conditions, respiratory diseases and gastrointestinal disorders.
- Infant & congenital conditions, such as pre-term birth & low birthweight complications, birth trauma & asphyxia and SIDS, were responsible for almost all of the fatal burden in Indigenous infants in 2018.
- In Indigenous Australians aged under 45 (excluding infants), injuries (suicide & self-inflicted injuries, poisoning, road traffic injuries, homicide & violence) and coronary heart disease were the leading individual causes of fatal burden.
- In people aged 45 and over, coronary heart disease, lung cancer, COPD, chronic kidney disease, chronic liver disease and type 2 diabetes were the leading individual causes of fatal burden.

Figure 6: Percentage contribution (%) of the top 10 leading causes of fatal burden (YLL) in Indigenous Australians, by disease group and sex, 2018



Notes

1. Per cent labels are not shown for disease groups contributing less than 3% of burden.
2. 'All other disease groups' includes mental & substance use disorders, reproductive & maternal conditions, skin disorders, oral disorders, blood & metabolic disorders and musculoskeletal conditions.

A large proportion of burden could be prevented

- Almost half (49%) of the total burden of disease (DALY)—three-fifths (60%) of all fatal burden (YLL) and nearly two-fifths (39%) of all non-fatal burden (YLD)—experienced by Indigenous Australians in 2018 could potentially have been prevented by avoiding or reducing exposure to the risk factors included in this study (which did not include the social determinants of health).
- The 5 risk factors that caused the most burden among Indigenous Australians in 2018 were tobacco use (responsible for 11.9% of total burden), alcohol use (10.5%), overweight (including obesity) (9.7%), illicit drug use (6.9%) and dietary risks (6.2%). Of all the dietary risk factors, a diet low in legumes contributed the most to total burden (1.5%).
- Tobacco use was the leading contributor to fatal burden (contributing more than 800 attributable deaths and 19% of all YLL), followed by overweight (including obesity) (12% of YLL).
- For non-fatal burden, alcohol use was the leading contributor (9.2% of YLD), followed by overweight (including obesity) (7.4% of YLD) (Table 1).

Social determinants of health as risk factors

Risk factors that were social determinants (such as income, employment and education) were not included in the ABDS 2018 due to the difficulty in obtaining good estimates of the risk associated with specific conditions.

Social determinants of health play an important role in determining the health of a population, often having a strong association with health outcomes and health behaviours. Their association with Indigenous health and with the health gap between Indigenous and non-Indigenous Australians is well documented. Their importance is clear, and it is hoped that they may be included as risk factors in future burden of disease studies.

The burden among Indigenous Australians is broken down across socioeconomic groups later in this report.

Table 1: Proportion (%) of total burden (DALY), fatal burden (YLL) and non-fatal burden (YLD) attributable to the leading risk factors, Indigenous Australians, 2018

Rank	Total burden (DALY)		Fatal burden (YLL)		Non-fatal burden (YLD)	
	Risk factor	% of burden	Risk factor	% of burden	Risk factor	% of burden
1	Tobacco use	11.9	Tobacco use	19.0	Alcohol use	9.2
2	Alcohol use	10.5	Overweight (including obesity)	12.3	Overweight (including obesity)	7.4
3	Overweight (including obesity)	9.7	Alcohol use	11.8	Child abuse & neglect	6.1
4	Illicit drug use	6.9	Dietary risks	10.8	Tobacco use	5.5
5	Dietary risks	6.2	Illicit drug use	8.9	Illicit drug use	5.1
	<i>All risk factors (joint effect)</i>	<i>49.1</i>	<i>All risk factors (joint effect)</i>	<i>60.4</i>	<i>All risk factors (joint effect)</i>	<i>38.9</i>

Why risk factor estimates cannot be added together

The estimates for different risk factors cannot simply be added to derive their total attributable burden, due to the complex pathways and interactions between them. For example, physical inactivity increases the chance of having high body mass, and both increase the risk of cardiovascular diseases. In order to estimate the combined attributable burden due to all risk factors (the joint effect), further analysis which takes into account these interactions is required. This has been done where estimates of burden attributable to 'all risk factors' are reported.

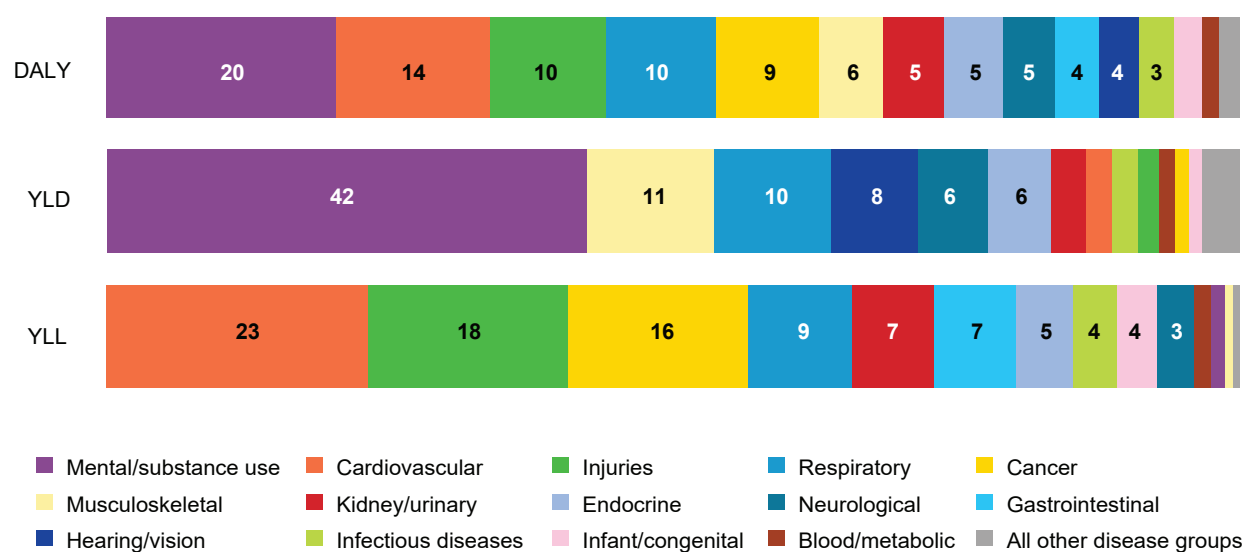
Contribution of risk factors to total burden differs by disease group

- Tobacco use contributed to 47% of the total burden from respiratory diseases, 37% of the total burden from cancer and 34% of the total burden from cardiovascular diseases.
- Overweight (including obesity) contributed to 59% of the total burden from endocrine disorders, 52% of the total burden from kidney & urinary diseases and 33% of the total cardiovascular disease burden.
- Dietary risks and high blood pressure also contributed substantially to the total burden of cardiovascular diseases (45% and 34%, respectively).
- The proportion of total burden attributable to alcohol use was highest for injuries (29%), followed by mental & substance use disorders (20%).

Gap in health outcomes

- After adjusting for differences in population size and age (by using age-standardised rates), the rate of total burden (DALY) among Indigenous Australians in 2018 was 2.3 times the rate for non-Indigenous Australians.
- Five disease groups accounted for over three-fifths (63%) of the gap in **total disease burden** between Indigenous and non-Indigenous Australians (based on age-standardised DALY rate differences): mental & substance use disorders, cardiovascular diseases, injuries, respiratory diseases and cancer (Figure 7).
- The individual diseases contributing the most to the gap in total disease burden (DALY) were coronary heart disease (8.3% of the gap) and COPD (6.1%).
- Kidney & urinary diseases and endocrine disorders (including diabetes) had the largest relative disparities in disease burden (based on age-standardised DALY rate ratios). Indigenous Australians experienced disease burden from these disease groups at 6.3 and 3.6 times the rate of non-Indigenous Australians, respectively.
- Mental & substance use disorders and musculoskeletal conditions were the largest contributors to the gap in **non-fatal burden** between Indigenous and non-Indigenous Australians, together accounting for 53% of the gap. Cardiovascular diseases, injuries and cancer were the largest contributors to the gap in **fatal burden**, together accounting for 57% of the gap (Figure 7).

Figure 7: Percentage contribution (%) of leading disease groups to the gap between Indigenous and non-Indigenous Australians in total (DALY), non-fatal (YLD) and fatal (YLL) burden, 2018



Notes

- 1. Per cent labels are not shown for disease groups contributing less than 3% of gap.
- 2. 'All other disease groups' includes oral disorders, skin disorders and reproductive & maternal conditions.

- The combined impact of the risk factors examined in this study accounted for two-thirds (66%) of the gap in **total disease burden** between Indigenous and non-Indigenous Australians. Tobacco use contributed the most to the gap (20%), followed by overweight (including obesity) (15%).

Changes in Indigenous burden since 2003

Overall total burden of disease has reduced

After accounting for the increase in size and ageing of the Indigenous Australian population (by using age-standardised rates), there was a 15% decrease in the rate of total burden (DALY) between 2003 and 2018 (from 467 to 400 DALY per 1,000 people, Figure 8). Most of this decline was observed between 2003 and 2011 (48 DALY per 1,000; a 10% decrease). There was a 4.8% decrease between 2011 and 2018 (from 420 to 400 DALY per 1,000).

Large reduction in burden from dying prematurely

The improvement in total burden resulted from a large reduction (27%) in the age-standardised rate of fatal burden (from 275 to 201 YLL per 1,000 people, Figure 8) between 2003 and 2018. This was due to preventing or delaying deaths from many diseases and injuries.

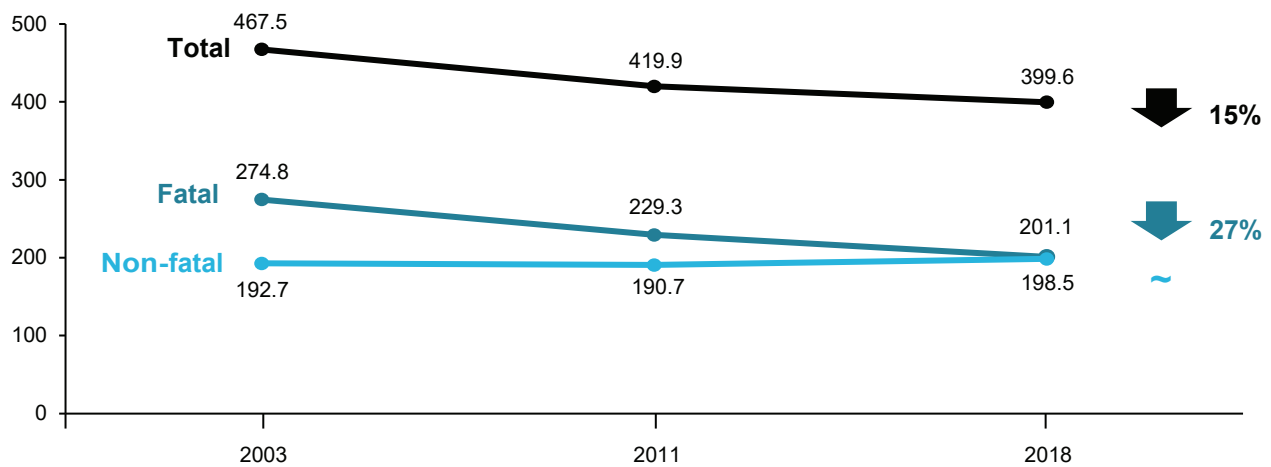
At the disease group level, there were large reductions in the rates of fatal burden from endocrine disorders (63%), cardiovascular diseases (47%), infectious diseases (45%) and gastrointestinal disorders (23%). There was an increase in the rate of fatal burden due to kidney & urinary diseases (14%).

No improvements in burden from living with disease

There was no substantial change in the age-standardised rate of non-fatal burden for Indigenous Australians between 2003 and 2018 (Figure 8). Over this period most disease groups showed little change in the rates of non-fatal burden, however, rates increased for some disease groups, including mental & substance use disorders (26% increase), and reduced for others, including hearing & vision disorders (22% decline) and musculoskeletal conditions (17% decline).

Figure 8: Change between 2003 and 2018 in the age-standardised total burden (DALY), fatal burden (YLL) and non-fatal burden (YLD) rate (per 1,000 people) for Indigenous Australians

Age-standardised rate per 1,000 people



Note: Rates were age-standardised to the 2001 Australian Standard Population.

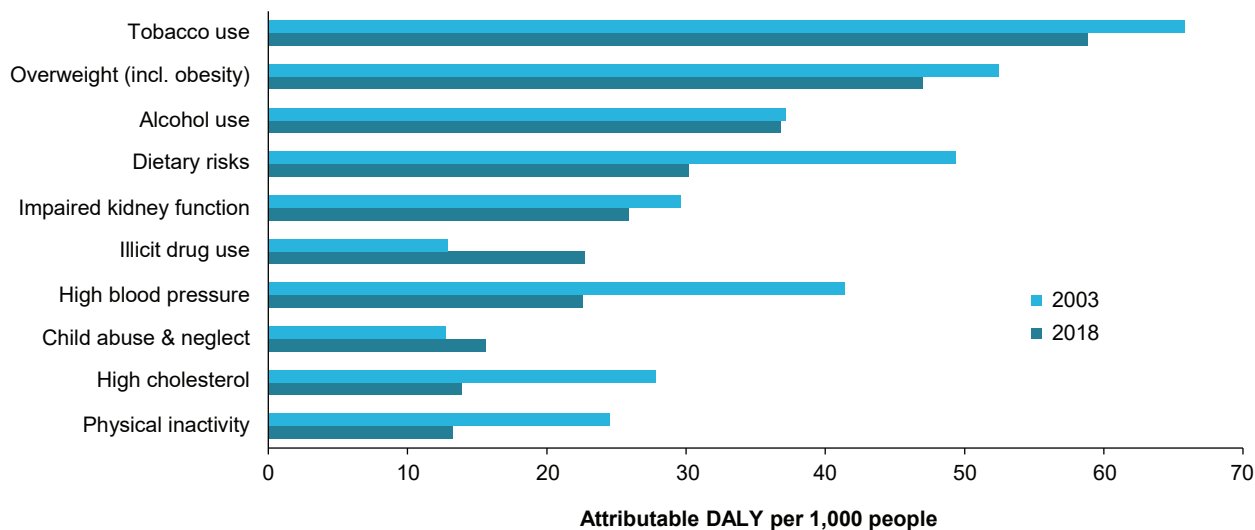
Reductions in total burden due to some risk factors

Between 2003 and 2018, there was a small increase in the proportion of total burden attributable to the risk factors measured at both time points (from 41% in 2003 to 45% in 2018). This reflects changes in exposure to the risk factors, or in burden from the linked diseases, or both. (Note that high blood plasma glucose, air pollution, unsafe sanitation, and low birthweight & short gestation could not be measured for 2003 and were therefore excluded from the comparison between 2003 and 2018.)

After accounting for population growth and ageing between 2003 and 2018 (using age-standardised rates), there was a fall in the rate of total burden (DALY) attributable to tobacco use (from 66 to 59 DALY per 1,000; 11% drop) and overweight (including obesity) (from 53 to 47 DALY per 1,000; 10% drop). The rate of total burden attributable to alcohol use was relatively steady over time (from 37.1 to 36.8 per 1,000) (Figure 9).

Other risk factors in which there were notable decreases in age-standardised DALY rates over time include: dietary risks (from 49 to 30 per 1,000; 39%), high blood pressure (from 41 to 23 per 1,000; 45%), high cholesterol (from 28 to 14 per 1,000; 50%), and physical inactivity (from 25 to 13 per 1,000; 46%). The age-standardised DALY rate for illicit drug use increased over this period, from 13 to 23 per 1,000; 77%).

Figure 9: Change between 2003 and 2018 in the age-standardised attributable total burden rate (DALY per 1,000 people) for selected risk factors, Indigenous Australians

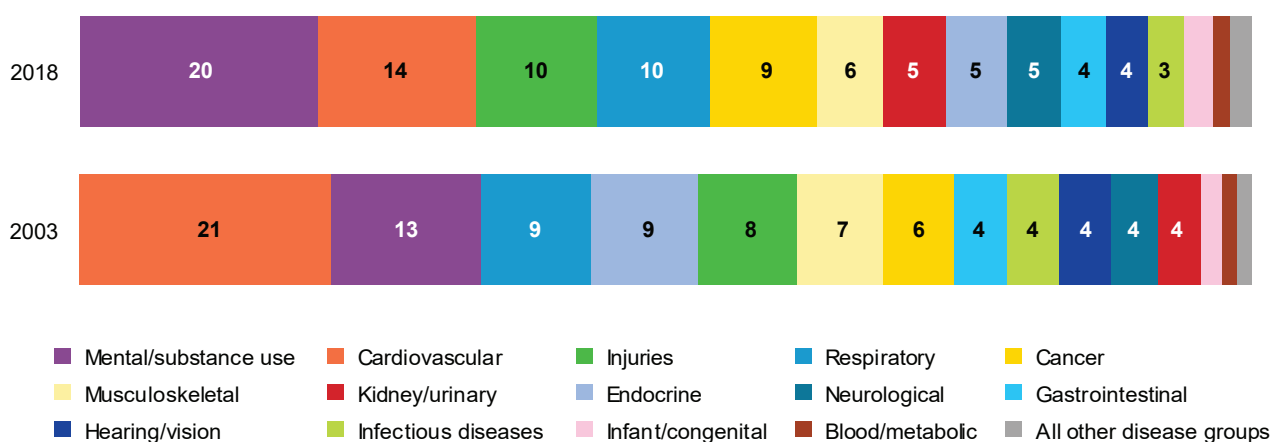


Note: Rates were age-standardised to the 2001 Australian Standard Population.

Changes in the gap

- The overall gap in total disease burden between Indigenous and non-Indigenous Australians decreased by 16% between 2003 and 2018 (age-standardised DALY rate differences of 263 and 222 per 1,000 people, respectively). This decline was driven by a decrease in the gap in fatal burden (28%), while the gap in non-fatal burden increased slightly (6.6%).
- In 2003 cardiovascular diseases was the leading contributor to the gap, followed by mental & substance use disorders and respiratory diseases. In 2018, mental & substance use disorders was the leading contributor to the gap, followed by cardiovascular diseases and injuries (Figure 10).

Figure 10: Percentage contribution (%) of leading disease groups to the gap in total disease burden (based on DALY rate differences), 2003 and 2018



Notes

1. Per cent labels are not shown for disease groups contributing less than 3% of gap.

2. 'All other disease groups' includes oral disorders, skin disorders and reproductive & maternal conditions.

Changes in the risk factors contributing to the gap

Between 2003 and 2018, the age-standardised rate of disease burden attributed to several risk factors declined for both Indigenous and non-Indigenous Australians. In terms of changes in the gap between Indigenous and non-Indigenous Australians there was:

- a narrowing of the gap in disease burden (as measured by age-standardised DALY rate differences) attributed to physical inactivity, occupational exposures & hazards, and low bone mineral density; indicating that the declines in burden observed for the Indigenous population were greater than for the non-Indigenous population
- a widening of the gap in burden attributed to illicit drug use and child abuse & neglect.

Changes in total burden of individual diseases

- The 15 diseases which caused the highest rate of total burden (age-standardised DALY rate) among Indigenous Australians remained largely the same between 2003 and 2018.
- Coronary heart disease was the leading cause of burden among Indigenous Australians in both 2003 and 2018, and also showed the largest reduction in total burden over time (47% decrease between 2003 and 2018, from 55 to 29 DALY per 1,000 people). This reduction was mainly driven by large declines in fatal burden.
- Total burden rates also decreased notably for stroke (53% decrease), rheumatoid arthritis (43% decrease), type 2 diabetes (42% decrease) and COPD (22% decrease).

Geographic and population differences in burden

This section focuses on the variation in burden of disease and injury across states and territories, remoteness areas and socioeconomic groups within the Indigenous population. Such variation reflects a complex interaction of factors, such as demographic, socioeconomic and environmental variations, and variation in access to services and in the prevalence of risky health behaviours.

Subnational estimates are presented for:

- Four states and territories: New South Wales, Queensland, Western Australia and the Northern Territory. Estimates are not presented for the other states and territories due to small numbers of Indigenous deaths and lack of suitable mortality adjustment factors.
- Five remoteness categories at the national level (*Major cities, Inner regional, Outer regional, Remote and Very remote*).
- Five levels (quintiles) of socioeconomic disadvantage at the national level for the Indigenous population only. The 2016 Indigenous Relative Socioeconomic Outcomes (IRSEO) index was used for Indigenous estimates (Biddle & Markham 2017).

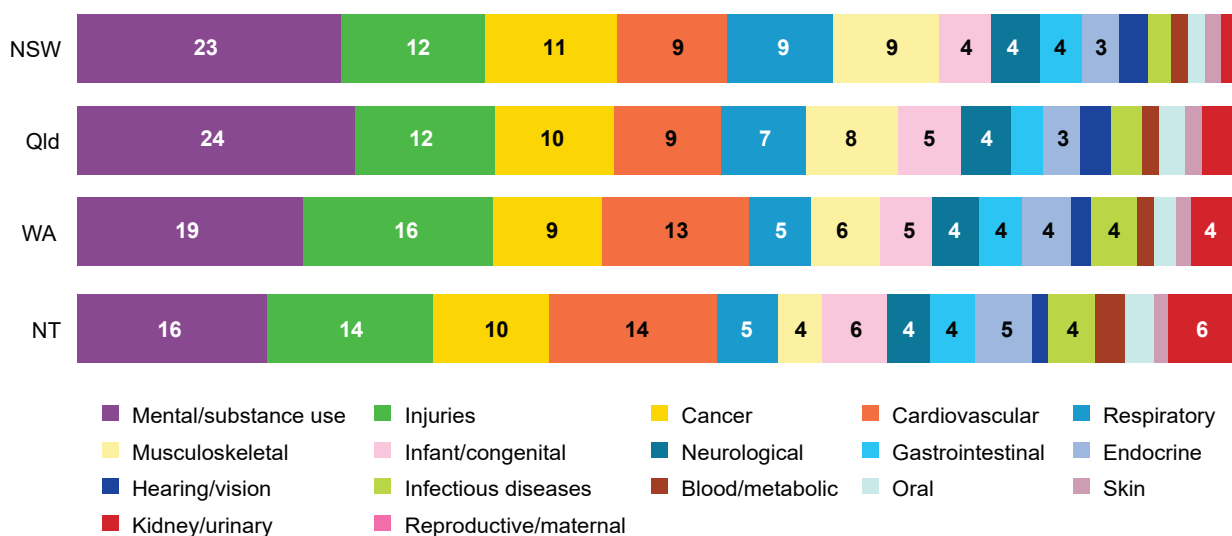
State and territory

- Among the 4 jurisdictions for which Indigenous burden estimates were calculated, age-standardised DALY rates were the highest in the Northern Territory (479 per 1,000 people) and Western Australia (468 per 1,000), followed by New South Wales and Queensland (397 and 383 per 1,000, respectively) (Figure 11).
- Western Australia had the highest rate of non-fatal burden (age-standardised rate of 204 YLD per 1,000 people), while the Northern Territory had the highest rate of fatal burden (292 YLL per 1,000). There was greater variation in Indigenous rates of fatal burden across the 4 states and territories than in rates of non-fatal burden.
- Western Australia and the Northern Territory had higher rates of disease burden (DALY) due to cardiovascular diseases, kidney & urinary diseases, injuries, endocrine disorders (including diabetes) and infectious diseases compared to New South Wales and Queensland.
- Looking at the leading disease groups contributing to total burden (DALY) for states and territories (Figure 12):
 - Mental & substance use disorders was the leading contributor to total burden across all 4 jurisdictions.
 - Injuries, cancer and cardiovascular diseases were among the top 5 disease group contributors for all 4 jurisdictions.
 - Musculoskeletal conditions ranked higher (fifth or sixth) and contributed more to total burden in the 3 states than in the Northern Territory (ranked 11th).
 - Kidney & urinary diseases ranked higher (fifth) in the Northern Territory than in the 3 states (ranked 11th to 16th).

Figure 11: Age-standardised rates (per 1,000 people) of total (DALY), non-fatal (YLD) and fatal (YLL) burden by state/territory (NSW, Qld, WA and the NT), Indigenous Australians, 2018



Figure 12: Causes of total burden (proportion of DALY, %) by state/territory (NSW, Qld, WA and the NT), Indigenous Australians, 2018



Note: Per cent labels are not shown for disease groups contributing less than 3% of burden.

- Mental & substance use disorders and musculoskeletal conditions were the leading 2 contributors of non-fatal burden (YLD) for all 4 jurisdictions. Mental & substance use disorders contributed around 40% of YLD for each jurisdiction, however, musculoskeletal conditions contributed quite different proportions to total YLD across the jurisdictions ranging from 8.1% in the Northern Territory to 17% in New South Wales.
- Injuries were the leading cause of fatal burden (YLL) in New South Wales, Queensland and Western Australia, contributing between 24% and 27% of YLL. Injuries ranked second in the Northern Territory and contributed 21% of YLL.
- Cardiovascular diseases were the leading cause of fatal burden in the Northern Territory, contributing to 22% of YLL, and ranked second in Western Australia and third in New South Wales and Queensland (contributing 21%, 17% and 17% of YLL, respectively).

Remoteness area

- In 2018, the age-standardised rate of total burden (DALY) was highest among Indigenous Australians in *Very remote* and *Remote* areas (492 and 486 DALY per 1,000 people, respectively) and lowest in *Inner regional* areas and *Major cities* (390 and 393 DALY per 1,000, respectively) (Figure 13).
- Mental & substance use disorders, cancer and cardiovascular diseases had the highest rates of burden among Indigenous Australians in all 5 remoteness categories.

- Looking at the leading disease groups contributing to total burden (DALY) by remoteness area (Figure 14):
 - Mental & substance use disorders was the leading disease group contributing to total burden in all 5 remoteness categories. Injuries and cancer were also leading contributors to burden, ranking in the top 4 across all remoteness categories.
 - Cardiovascular diseases ranked higher and contributed more to total burden in *Very remote* (ranked third) and *Remote* (ranked second) areas than in the other remoteness categories.
 - Endocrine disorders (including diabetes) and kidney & urinary diseases ranked much higher (fifth and sixth, respectively) in *Very remote* areas than in the other remoteness categories.

Figure 13: Age-standardised rates (per 1,000 people) of total (DALY), non-fatal (YLD) and fatal (YLL) burden by remoteness, Indigenous Australians, 2018

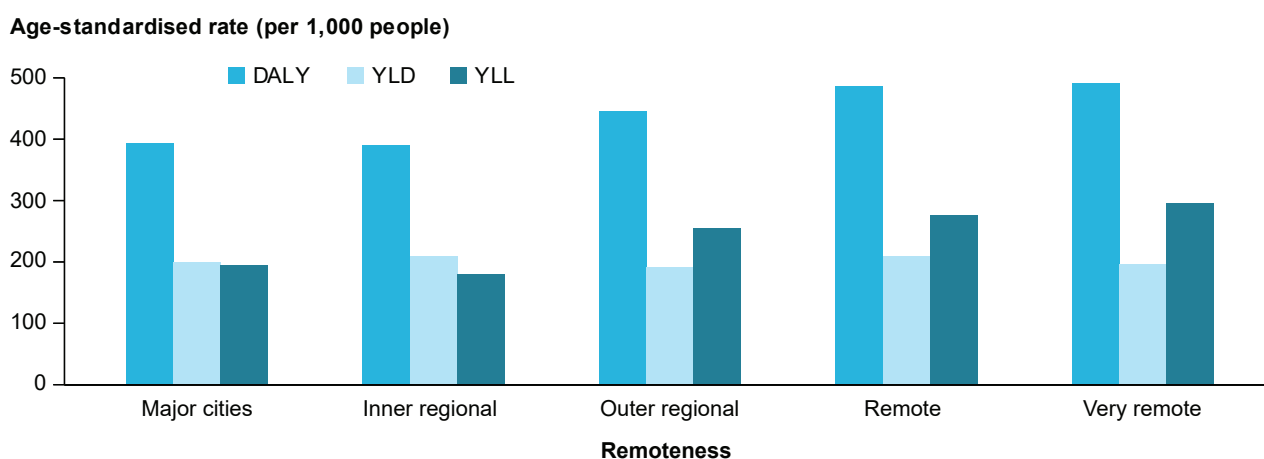
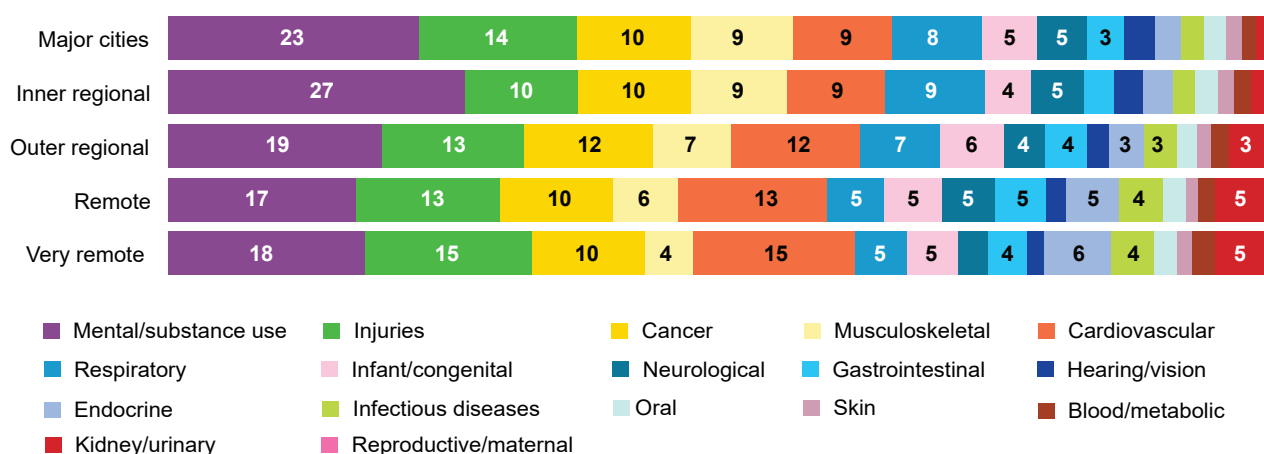


Figure 14: Causes of total burden (proportion of DALY, %) by remoteness, Indigenous Australians, 2018



Note: Per cent labels are not shown for disease groups contributing less than 3% of burden.

- Mental & substance use disorders and musculoskeletal conditions were the leading 2 contributors to non-fatal burden (YLD) in all remoteness categories:
 - the contribution of mental & substance use disorders to total YLD ranged from 37% in *Remote* areas to 46% in *Inner regional* areas
 - the contribution of musculoskeletal conditions to total YLD ranged from 9.1% in *Very remote* areas to 17% in *Major cities*.
- Injuries, cancer and cardiovascular diseases were the 3 largest contributors to fatal burden (YLL) in all remoteness categories, although the order of the top 3 differed across areas:
 - Injuries ranked first in *Major cities*, *Outer regional* and *Very remote* areas (contributing 28%, 21% and 23% of YLL, respectively)
 - Cancer ranked first in *Inner regional* areas, followed by injuries (contributing 23% and 22% of YLL, respectively)
 - Cardiovascular diseases ranked first in *Remote* areas, followed by injuries (contributing 21% and 20% of YLL, respectively).

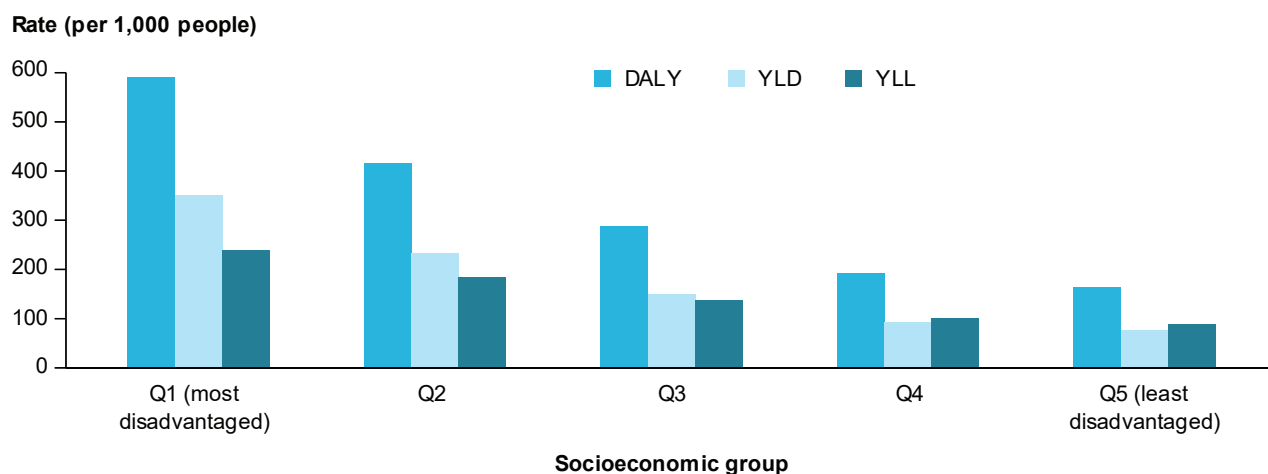
Socioeconomic groups

In this section, socioeconomic groups for Indigenous burden estimates are based on the 2016 Indigenous Relative Socioeconomic Outcomes (IRSEO) index. It reflects the level of socioeconomic disadvantage experienced by Indigenous Australians living in each Indigenous Area in Australia and incorporates 9 variables from the 2016 Census of Population and Housing that measure employment, occupation, education, income and housing (Biddle & Markham 2017). The analysis in this section divides the Indigenous population into 'quintiles' (fifths) of disadvantage, where the first quintile (Q1) represents the 20% of Indigenous Areas that have the lowest IRSEO index scores (most disadvantaged) and the fifth quintile (Q5) the 20% of areas with the highest scores (least disadvantaged).

Crude rather than age-standardised rates have been used as the IRSEO index incorporates a population age-weighting which results in little difference in the age-profile of the populations assigned to each quintile of socioeconomic disadvantage under the index.

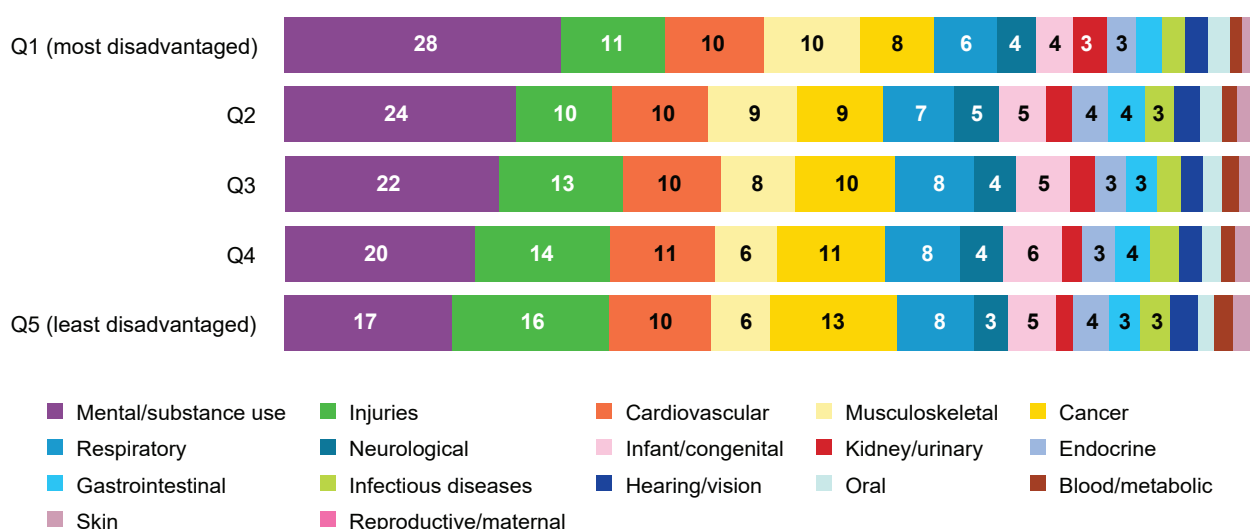
- The rates of total (DALY), non-fatal (YLD) and fatal (YLL) burden all increased with increasing disadvantage (Figure 15).
- Indigenous Australians living in areas with the most socioeconomic disadvantage experienced the highest rate of burden (591 DALY per 1,000 people), more than 3 times the rate of burden in areas with the least socioeconomic disadvantage (164 DALY per 1,000).
- The most disadvantaged areas experienced greater rates of burden (DALY) than the least disadvantaged areas in every disease group, with a gradient of increasing burden with increasing disadvantage observed in most disease groups.
 - The greatest relative differences were for kidney & urinary diseases, mental & substance use disorders and musculoskeletal conditions, with the most disadvantaged quintile experiencing disease burden at more than 5 times the rate of the least disadvantaged quintile.

Figure 15: Rates (per 1,000 people) of total (DALY), non-fatal (YLD) and fatal (YLL) burden by socioeconomic disadvantage quintile (IRSEO index), Indigenous Australians, 2018



- Looking at the disease groups contributing to total burden (DALY) by socioeconomic disadvantage quintile (Figure 16):
 - Mental & substance use disorders was the leading contributor to total burden across all 5 socioeconomic quintiles, contributing between 17% and 28% of burden.
 - Injuries was the second leading contributor to total burden across all 5 socioeconomic quintiles, contributing between 10% and 16% of burden.
 - Cardiovascular diseases, musculoskeletal conditions, cancer and respiratory diseases were also leading contributors to burden, ranking in the top 6 across all 5 socioeconomic quintiles—although the order of the disease group rankings and proportions differed across quintiles.

Figure 16: Causes of total burden (proportion of DALY, %), by socioeconomic disadvantage quintile (IRSEO index), Indigenous Australians, 2018



Note: Per cent labels are not shown for disease groups contributing less than 3% of burden.

- Mental & substance use disorders and musculoskeletal conditions were the leading 2 contributors to non-fatal burden (YLD) in all socioeconomic disadvantage quintiles:
 - the contribution of mental & substance use disorders to total YLD ranged from 36% in the least disadvantaged quintile to 47% in the most disadvantaged quintile
 - the contribution of musculoskeletal conditions to total YLD ranged from 12% in the least disadvantaged quintile to 16% in the most disadvantaged quintile.
- Injuries was the leading contributor to fatal burden (YLL) in all socioeconomic disadvantage quintiles, with the contribution to YLL ranging from 19% to 27%.
- Cancer and cardiovascular diseases were the second or third ranked contributors to fatal burden (YLL) in all socioeconomic disadvantage quintiles, although their ranking differed across quintiles.

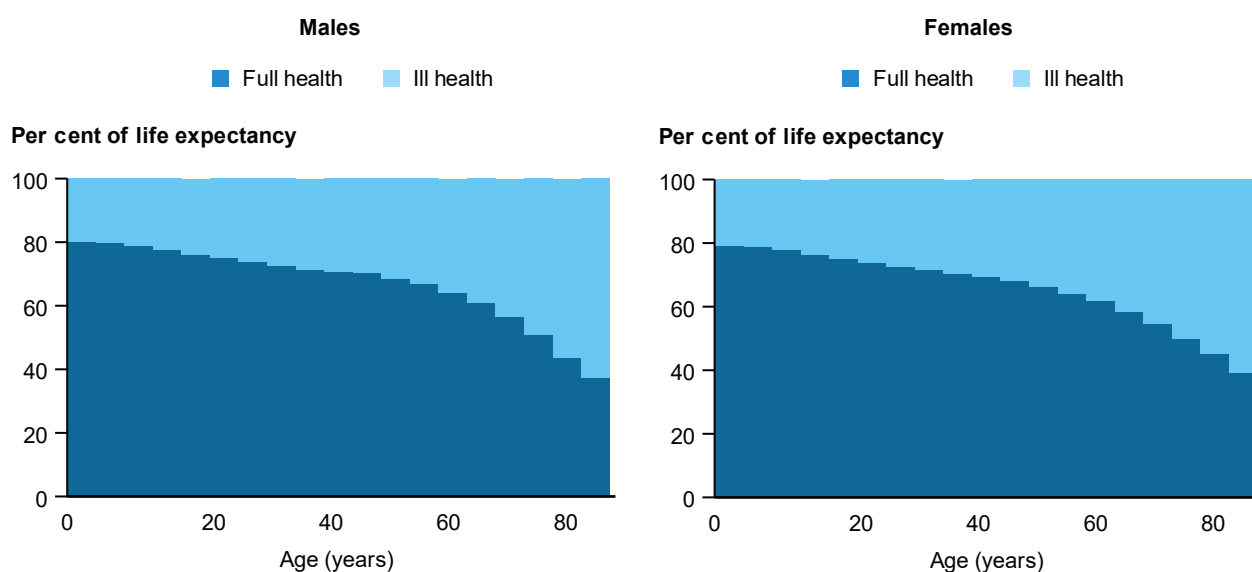
Measuring the health-adjusted life expectancy

The health-adjusted life expectancy (HALE) uses non-fatal burden (YLD) rates to estimate the average time people could expect to spend in ill health and full health over the course of their lives. HALE is most meaningful when compared with life expectancy. The ratio of HALE to life expectancy, expressed as a percentage, represents the proportion of life expectancy that is spent in full health. Comparing differences in life expectancy and HALE between areas or population groups shows where there are disparities in the number and proportion of years lived in full health.

On average, 80% of years lived are in full health

- Life expectancy for Indigenous males and females born in 2018 was 70.0 years and 74.4 years, respectively. HALE for Indigenous males born in 2018 was 56.0 years, and for Indigenous females was 58.8 years. On average, Indigenous males and females born in 2018 could expect to live 80% and 79% of their lives in full health, respectively.
- The proportion of remaining years people could expect to live in full health reduced with age (Figure 17). Indigenous Australians aged 65 in 2018 could, on average, expect to live three-fifths of their remaining lives in full health.

Figure 17: Percentage of remaining life expectancy in full health and ill health at each age, by sex, Indigenous Australians, 2018



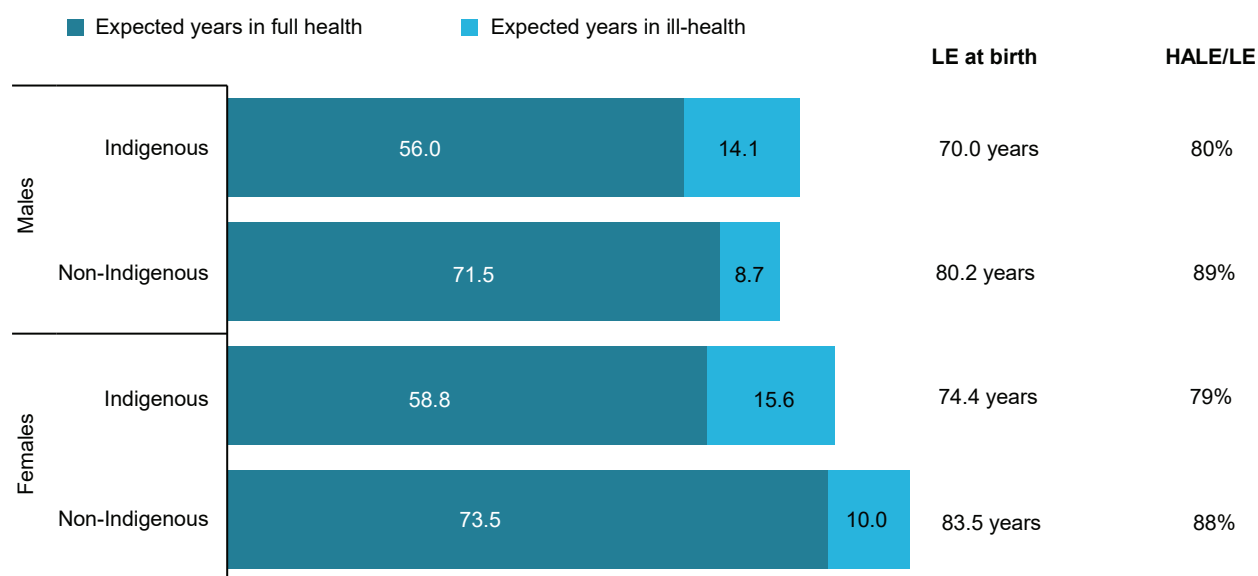
HALE varies between Indigenous Australians in different places

- In 2018, Indigenous males and females living in *Major Cities* had a longer life expectancy and HALE at birth and age 65, than Indigenous males and females living in *Remote and very remote* areas.
- Indigenous males and females living in New South Wales and Queensland had a longer life expectancy and HALE at birth, as well as at age 65, compared with their counterparts living in Western Australia and the Northern Territory.

HALE also varies between Indigenous and non-Indigenous Australians

- In 2018, the gap in HALE between Indigenous and non-Indigenous males at birth was 15.5 years (56.0 years for Indigenous males compared with 71.5 years for non-Indigenous males) (Figure 18). For females, the gap was slightly smaller at 14.7 years (58.8 years for Indigenous females compared with 73.5 years for non-Indigenous females). For both males and females, the gap in HALE was larger than the gap in life expectancy at birth (10.2 and 9.1 years, respectively).
- Indigenous males aged 65 in 2018 could expect to live a further 9.1 years in full health, compared with 14.6 years for non-Indigenous males, a gap of 5.5 years. For females, the gap was slightly larger at 6.2 years (HALE of 9.5 years for Indigenous females and 15.7 years for non-Indigenous females).
- The gap in HALE at birth varied by remoteness, being greater for people living in *Remote and very remote* areas compared with people living in *Major cities* or *Inner and outer regional* areas.

Figure 18: Life expectancy (LE) at birth as years lived in full health (HALE) and years lived in ill health, by sex and Indigenous status, 2018



Where can I find out more?

More information on the ABDS 2018 Aboriginal and Torres Strait Islander results, as well as interactive data visualisations and results for all Australians, can be found on the AIHW website at <http://www.aihw.gov.au/burden-of-disease/>.

Acknowledgments

This summary report on the Aboriginal and Torres Strait Islander results from the ABDS 2018 was authored by the Indigenous Burden of Disease Unit at the Australian Institute of Health and Welfare. The full lists of authors and expert advisors for the study can be found in the *Australian Burden of Disease Study: impact and causes of illness and death in Aboriginal and Torres Strait Islander people 2018* report. Funding for the study was provided by the Department of Health.

Abbreviations

ABDS	Australian Burden of Disease
AIHW	Australian Institute of Health and Welfare
COPD	chronic obstructive pulmonary disease
DALY	disability-adjusted life years
HALE	health adjusted life expectancy
IRSEO	Indigenous Relative Socioeconomic Outcomes
LBW	low birthweight
NSW	New South Wales
NT	Northern Territory
Qld	Queensland
RTI	road traffic injuries
SIDS	sudden infant death syndrome
WA	Western Australia
YLD	years lived with disability
YLL	years of life lost

References


Biddle N & Markham F 2017. Area level socioeconomic outcomes for Aboriginal and Torres Strait Islander Australians, 2016. Austaxpolicy: Tax and Transfer Policy Blog. Viewed 1 December 2020.

Related material

A full report on the ABDS 2018 Aboriginal and Torres Strait Islander results is available at www.aihw.gov.au/reports/indigenous-australians/illness-death-indigenous-2018/summary.

A full report on the Australian Burden of Disease Study 2018 results for all Australians is available at www.aihw.gov.au/reports/burden-of-disease/abds-impact-and-causes-of-illness-and-death-in-aus/summary.

Detailed information on the methods used in the ABDS 2018 study are available in a methods report www.aihw.gov.au/reports/burden-of-disease/abds-methods-supplementary-material-2018/contents/about.



This summary report presents key findings from the Australian Burden of Disease Study: impact and causes of illness and death in Aboriginal and Torres Strait Islander people 2018. It provides estimates of the burden due to 219 diseases and injuries in Indigenous Australians, the contribution of modifiable risk factors to this burden, and the gap between Indigenous and non-Indigenous Australians. An analysis of changes between 2003 and 2018 is also presented.

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