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Australian Institute of Health and Welfare

AIHW

Australian Burden of Disease Study

Impact and causes of illness and death in Australia 2018

Summary report

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The AIHW is an independent statutory Australian Government agency producing authoritative and accessible information and statistics to inform and support better policy and service delivery decisions, leading to better health and wellbeing for all Australians.

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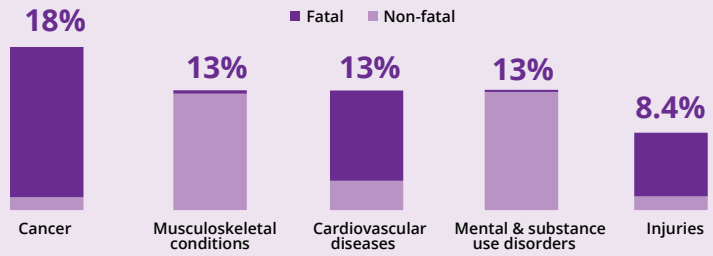
In 2018, Australians lost 5 million years of healthy life (total burden, DALY) due to:

Living with illness (non-fatal)
52% of total burden

Dying prematurely (fatal)
48% 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 causing total burden:

1. Coronary heart disease **6.3%**
2. Back pain & problems **4.5%**
3. Dementia **4.0%**
4. Chronic obstructive pulmonary disease (COPD) **3.5%**
5. Lung cancer **3.2%**

Exposure to risk factors contributed 38% of the total burden

The 5 risk factors contributing the most burden were:

1. Tobacco use **8.6%**
2. Overweight **8.4%** (including obesity)
3. Dietary risks **5.4%**
4. High blood pressure **5.1%**
5. Alcohol use **4.5%**

Burden differs across geographic areas and population groups

Total burden (DALY rate) in:

Northern Territory is **1.4** x National average

Remote and very remote areas is **1.4** x Major cities

Lowest socioeconomic group is **1.6** x Highest socioeconomic group

There were substantial improvements in population health between 2003 and 2018 with:

Total burden	Fatal burden	Non-fatal burden
13%	24%	0%

Biggest absolute reduction in burden (DALY rate) came from:
- Cardiovascular diseases
- Cancers

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

What is burden of disease analysis and why is it important?

Burden of disease analysis measures the impact of disease and injury in a population by estimating the number of healthy years of life lost ('disability-adjusted life years' or DALY). 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 (ABDS) 2018

The ABDS 2018 is based on the Australian Institute of Health and Welfare's (AIHW) previous burden of disease studies and provides an update of the Australian-specific burden of disease estimates since the ABDS 2015.

The ABDS 2018, prepared for publication in 2021, provides estimates for the reference year 2018 and recalculations of the 2015, 2011 and 2003 estimates using new data sources and methods, where applicable. The study estimates the total, fatal and non-fatal burden of disease at the national level, as well as by state and territory, remoteness area and socioeconomic group.

This report is a summary of the ABDS 2018 findings. Full results and more detailed information can be found in the ABDS 2018 detailed report (AIHW 2021a), methods report (AIHW 2021b) and interactive data visualisations (AIHW 2021c, AIHW 2021d). Detailed estimates and comparisons of burden of disease between Aboriginal and Torres Strait Islander peoples and non-Indigenous Australians for 2018 will be published in early 2022 (AIHW forthcoming 2022). Additionally, health-care expenditure estimates for all of the diseases and injuries included in the ABDS 2018 can be found in the AIHW report *Disease expenditure in Australia 2018–19* (AIHW 2021f).

Several key improvements were adopted for the ABDS 2018 compared with the ABDS 2015. Among these improvements were: a more comprehensive list of diseases and risk factors of relevance in Australia, and better use of linked health data to estimate disease burden. See chapters 1 and 10 of the ABDS detailed report for more information on improvements between ABDS 2015 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. YLD represents non-fatal burden. It can be expressed as the number of YLD in a population, or as a crude or age-standardised rate per 1,000.

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 represents fatal burden. It can be expressed as the number of YLL in a population, or as a crude or age-standardised rate per 1,000.

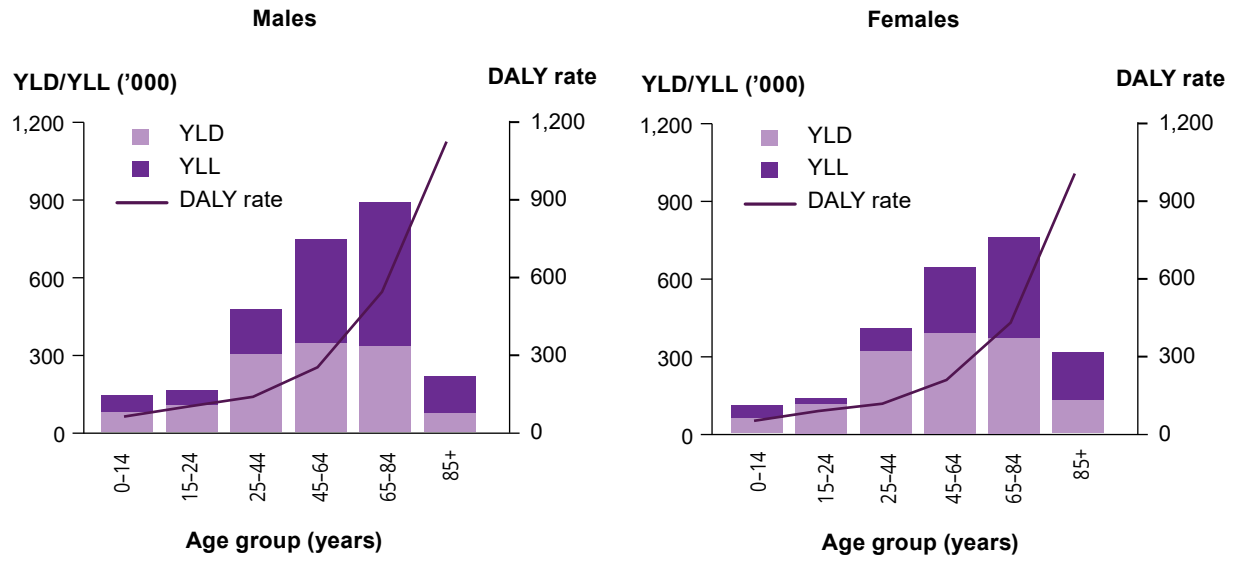
Disability-adjusted life years (DALY): A measure (in years) of healthy life lost either through living with illness due to disease and injury (YLD) or through dying prematurely (YLL). The DALY measure represents total burden (the sum of YLD and YLL) and can be referred to as health loss. It can be expressed as the number of DALY in a population, or as a crude or age-standardised rate per 1,000.

Attributable burden: The amount of burden that could be reduced if exposure to a risk factor had been 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 per 1,000.

Total burden across the life course

- In 2018, the Australian population lost 5.0 million years of healthy life due to living with or dying prematurely from disease and injury (total burden, DALY).
- Total burden of disease (DALY) was lowest in young Australians and generally greater in the older age groups (Figure 1).
- Males experienced more total burden than females for all age groups up to 85, due to males having more fatal burden than females in these age groups.
- The rate of health loss was 199 DALY per 1,000 population. This rate increased sharply after age 45 and peaked in the oldest population due to this group having proportionally greater illness and death compared with the younger populations (Figure 1).

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

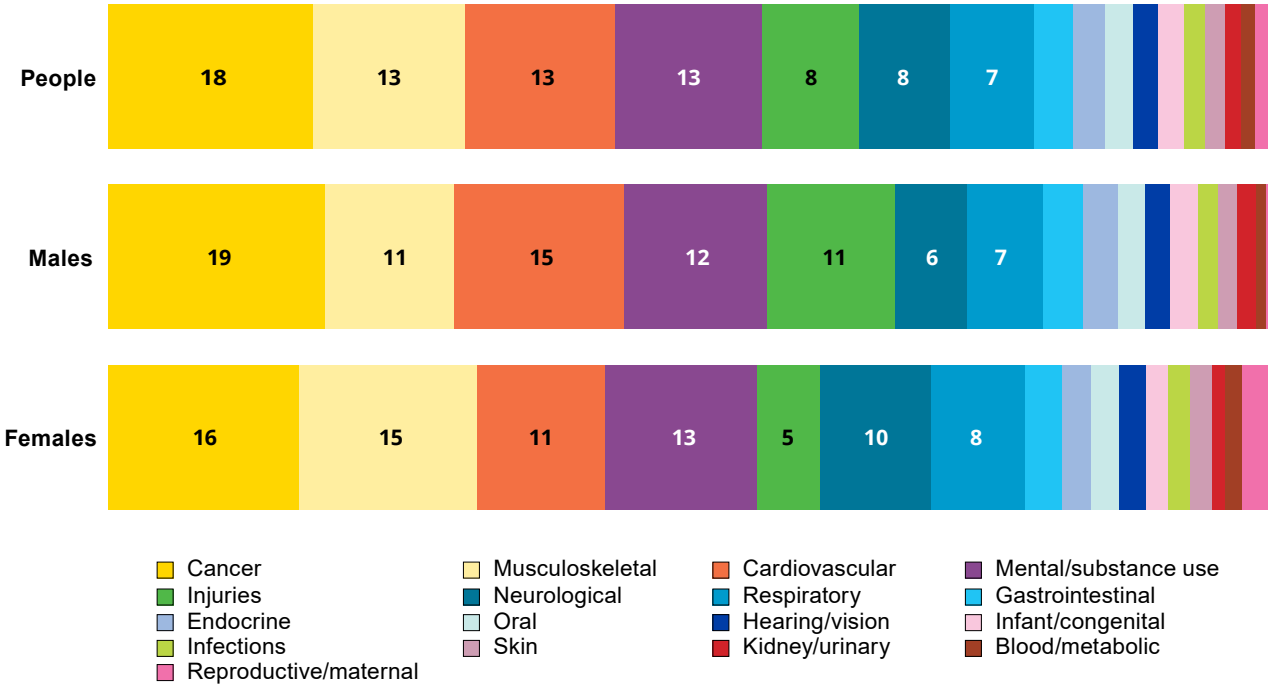


- Children aged under 15 experienced slightly more than half of their total burden from living with illness (YLD; 55%) and 45% from dying prematurely (YLL). In people aged 15–44, the proportion of non-fatal burden increased to over two-thirds of total burden. However, older Australians (aged 65 and over) experienced a higher proportion of fatal burden than non-fatal burden.

Chronic disease and injury dominate

- The disease group causing the most total burden (DALY) in 2018 was cancer (18% of the total burden), followed by musculoskeletal conditions, cardiovascular diseases and mental health conditions & substance use disorders (each 13%). Injuries accounted for 8.4% of total burden (Figure 2). Together, these disease groups accounted for around two-thirds of the total burden in Australia.
- Males and females experienced the majority of their total burden from the same disease groups. However, cancer, cardiovascular diseases and injuries accounted for a greater proportion of the total burden in males than in females, while musculoskeletal, neurological conditions (which includes dementia) and respiratory diseases accounted for more of the total burden in females (Figure 2).
- At the specific disease level, the leading 5 causes of total burden were coronary heart disease (6.3% of total burden), back pain & problems (4.5%), dementia (4.0%), chronic obstructive pulmonary disease (COPD) (3.5%) and lung cancer (3.2%).

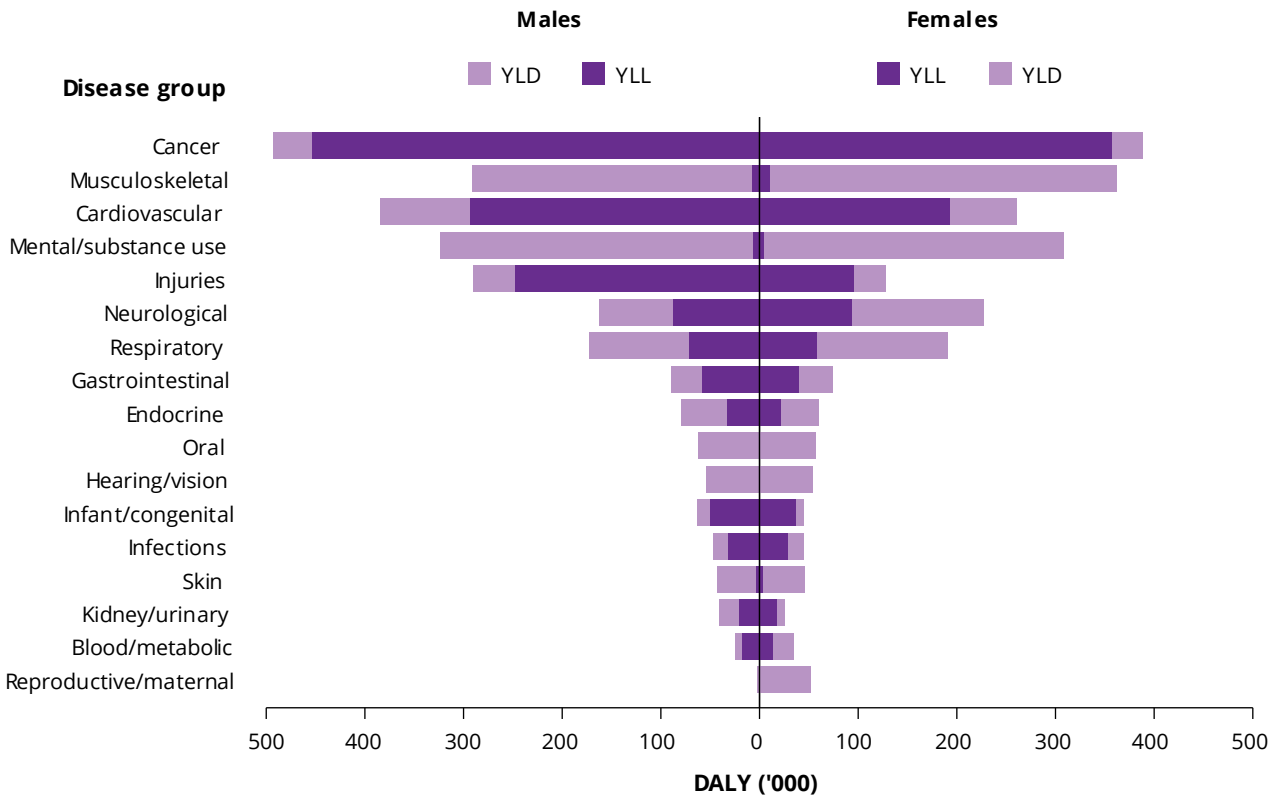
Figure 2: Proportion (%) of total burden (DALY), by disease group and sex, 2018



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

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

Figure 3: Non-fatal (YLD) and fatal (YLL) burden, by disease group and sex, 2018



Males and females had uneven shares of the burden in disease groups

While the overall total burden of disease was split 53% and 47% between males and females, there were some disease groups where the burden was more unevenly shared (Figure 3).

- Males experienced 69% of the total burden from injuries and a greater share of the total burden from kidney & urinary diseases (62%), cardiovascular diseases (60%), infant & congenital conditions (58%), endocrine disorders (mostly diabetes) (57%) and cancer (56%).
- Females had a greater share of the total burden from reproductive & maternal conditions (96%), neurological conditions (which includes dementia) (58%), blood & metabolic disorders (which includes iron-deficiency anaemia) (58%) and musculoskeletal conditions (55%).

Diseases that caused the most burden across the life course

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

Disease groups

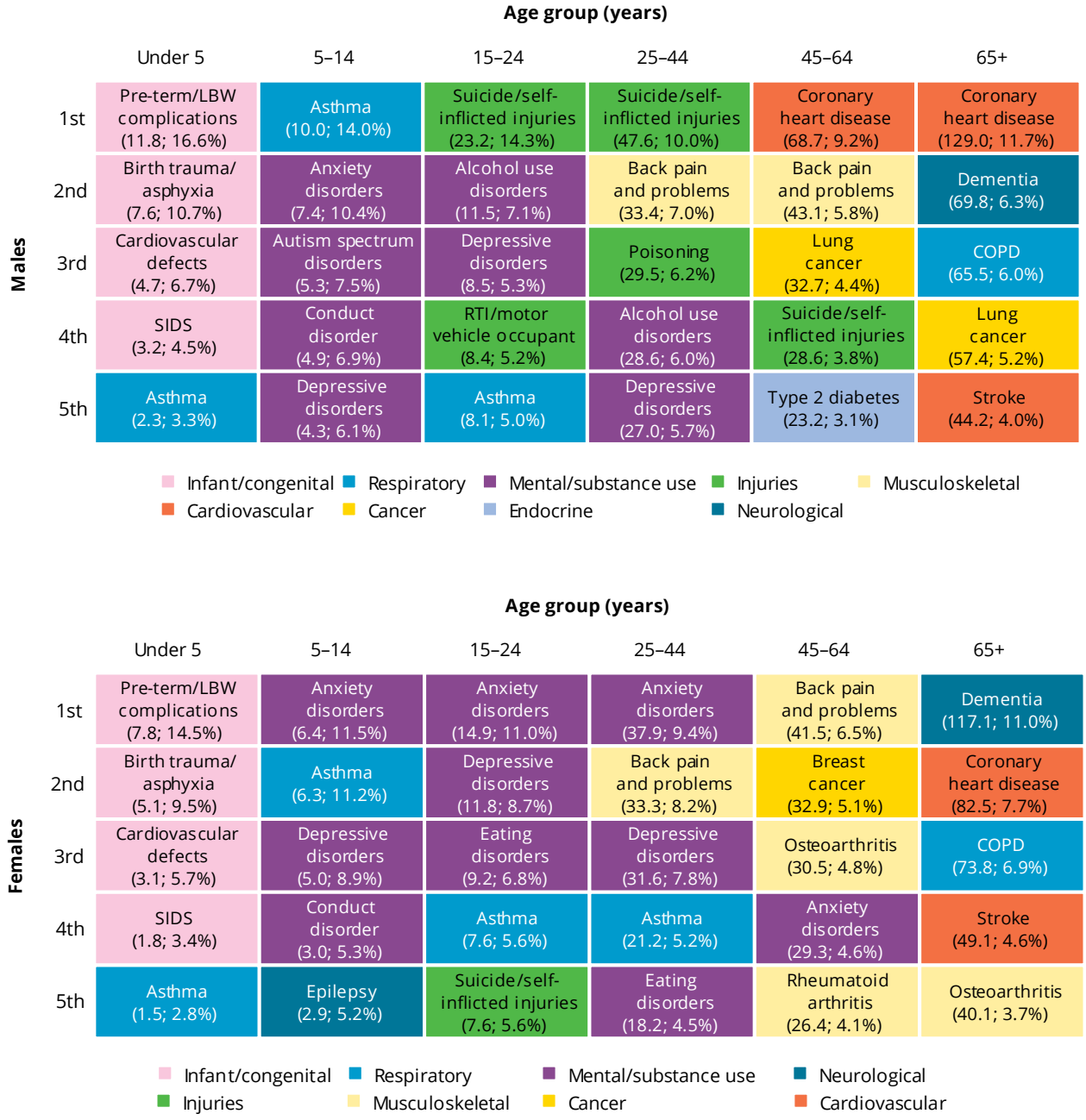
- Infant & congenital conditions was the disease group that caused the most total burden among infants and children aged under 5 (60% of total burden), followed by injuries (7.2%).
- The disease groups mental health conditions & substance use disorders (which for children predominantly includes mental health conditions) and respiratory diseases together accounted for over half of the total burden in children aged 5–14 (37% and 14%, respectively). Injuries contributed 9.1% to total burden in this age group.
- Mental health conditions & substance use disorders was the leading disease group causing total burden among Australians aged 15–44 (32%). The proportion of total burden due to injuries was 19% in this age group.
- Total burden due to cancer increased with age and was the main disease group causing burden in Australians aged 45–64 (22%), as well as those aged 65 and over (23%).
- The proportion of total burden due to musculoskeletal conditions was highest among those aged 45–64 (19%), whereas the proportion of total burden due to cardiovascular diseases and neurological conditions (which includes dementia) was highest among those aged 65 and over (21% and 12%, respectively).

Specific diseases/injuries

- Ages under 5:
  - Pre-term & low birthweight complications, birth trauma & asphyxia, cardiovascular defects, sudden infant death syndrome and asthma were the leading 5 causes of total burden for infants and young children.
- Ages 5–14:
  - Asthma was the leading cause of total burden for boys, followed by anxiety disorders. For girls, anxiety disorders was the leading cause of total burden, followed by asthma.
  - Depressive and conduct disorders were among the leading 5 causes of total burden for both girls (ranked third and fourth, respectively) and boys (ranked fifth and fourth, respectively).
  - Autism spectrum disorders was among the leading 5 causes of total burden for boys (ranked third), whereas epilepsy was among the leading 5 causes of total burden for girls (ranked fifth).
- Ages 15–24:
  - Suicide & self-inflicted injuries was the leading cause of total burden in males, whereas for females it was the fifth leading cause of total burden.
  - Among females, anxiety disorders was the leading cause of total burden and eating disorders was third, however, neither of these causes were in the top 5 for males.
  - Depressive disorders and asthma were among the top 5 causes of total burden for both males (ranked third and fifth, respectively) and females (ranked second and fourth, respectively).

- Ages 25–44:
  - Suicide & self-inflicted injuries was the leading cause of total burden for men in this age group; anxiety disorders was the leading cause for women.
  - For both men and women, back pain & problems (ranked second for both) and depressive disorders (ranked fifth and third, respectively) were among the leading 5 causes.
  - Poisoning (ranked third) and alcohol use disorders (ranked fourth) were in the top 5 causes of total burden for men, whereas asthma (ranked fourth) and eating disorders (ranked fifth) were among the top 5 causes of total burden for women.
- Ages 45–64:
  - Back pain & problems were in the leading 5 causes of total burden for both men and women in this age group (ranked first for women and second for men). Coronary heart disease was the leading cause of total burden in men.
  - Other musculoskeletal conditions (osteoarthritis and rheumatoid arthritis) were also in the top 5 causes of total burden for women, but not for men.
  - Anxiety disorders for women and suicide & self inflicted injuries for men were among the leading 5 causes of total burden but each contributed lower proportions of the total burden for ages 45–64 than for younger age groups.
  - Lung cancer was the third leading cause of total burden for men, whereas for women breast cancer was the second leading cause of total burden.
- Ages 65 and over:
  - Coronary heart disease, dementia, COPD and stroke were all among the leading causes of total burden in men and women in this age group, but with different rankings beween the sexes.
  - Lung cancer was ranked as the fourth leading cause of total burden for men (not in the top 5 for women) while osteoarthritis was ranked as the fifth leading cause of total burden among women (not ranked in the top 5 for men).

Figure 4: Leading causes of total burden (DALY '000; proportion %), by sex and age group, 2018



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'.

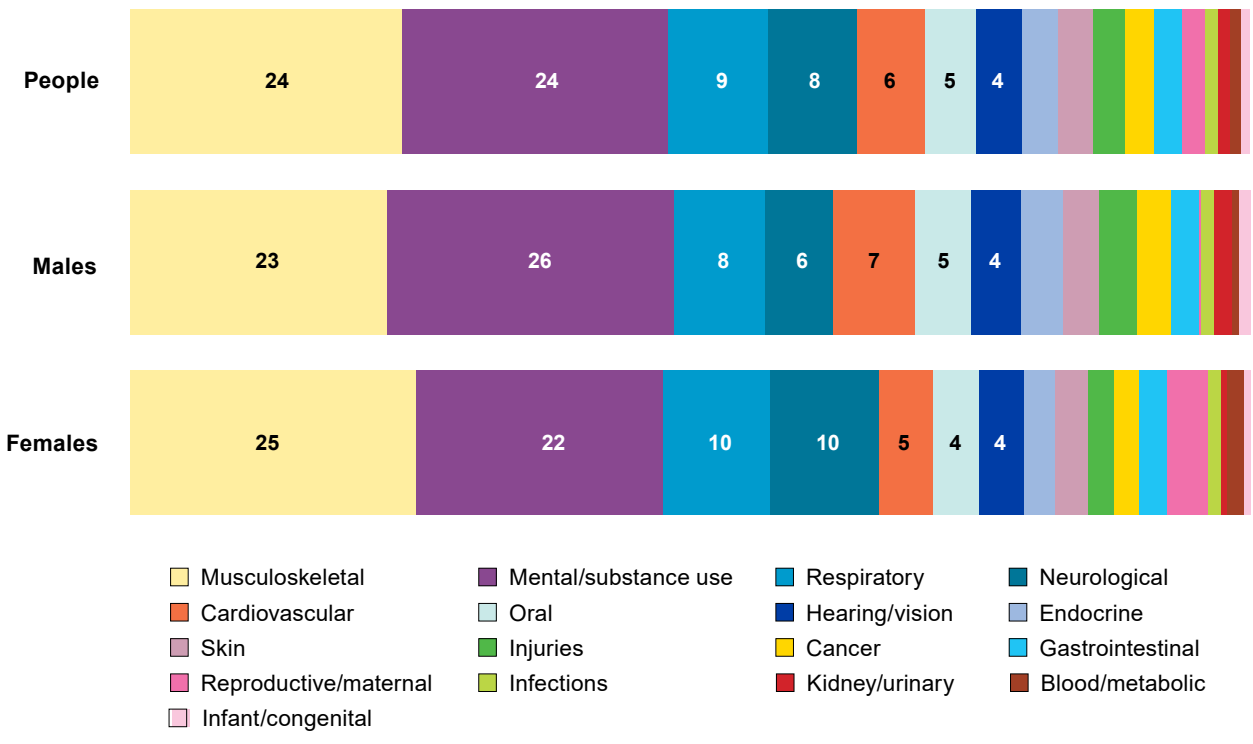
Impact of living with disease and injury

- In 2018, Australians lost 2.6 million years of healthy life due to the impact of living with disease and injury (non-fatal burden, YLD). This accounted for more than half (52%) of the total burden (DALY).
- The rate of non-fatal burden (number of YLD per 1,000 population) increased throughout the life course and peaked in the oldest Australians. Males and females experienced similar rates of non-fatal burden for most age groups.

Musculoskeletal and mental health conditions were the main disease groups causing non-fatal burden

- The top 2 disease groups causing non-fatal burden—musculoskeletal conditions and mental health conditions & substance use disorders—together accounted for 49% of the non-fatal burden in males and 47% in females (Figure 5).
- Respiratory diseases, neurological conditions and cardiovascular diseases were the other main disease groups contributing to non-fatal burden. Together, they accounted for 21% of non-fatal burden in males and 25% in females.

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



- The leading 3 specific diseases causing non-fatal burden for both males and females were back pain & problems, anxiety disorders and depressive disorders. Asthma was ranked as the fourth highest disease contributing to non-fatal burden among males, and the fifth among females.
- Compared with females, males experienced more non-fatal burden from substance use disorders (alcohol and drug use), coronary heart disease and autism spectrum disorders, while females experienced more non-fatal burden from osteoarthritis, dementia, eating disorders and migraine.

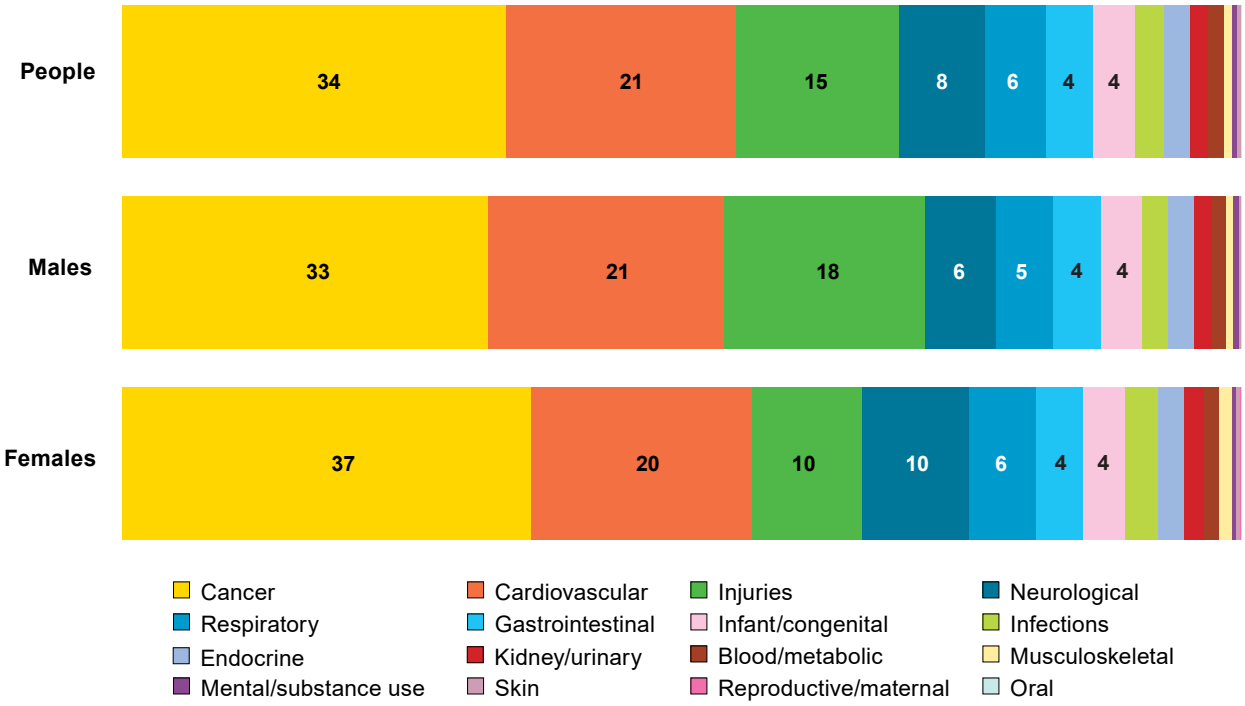
Impact of dying prematurely

- In 2018, there were 159,300 deaths in Australia, which resulted in 2.4 million years of life lost (fatal burden, YLL). Fatal burden accounted for 48% of the total burden of disease.
- Males experienced more fatal burden than females (59% compared with 41%). After adjusting for differences in age, the fatal burden rate was 61% higher in males (104 YLL per 1,000 population) than in females (65 YLL per 1,000 population).
- Australia has an ageing population, with 82% of deaths occurring in people aged 65 and over. The high number of deaths in these age groups contributed 53% of the fatal burden. In contrast, the small number of deaths (<1%) in infants (those aged under 1) contributed 3.4% to fatal burden in 2018, as each death of an infant incurred the maximum number of years of life lost.

Cancer and cardiovascular diseases caused most of the fatal burden

- Cancer (33% for males; 37% for females) and cardiovascular diseases (21% for males; 20% for females) caused most of the fatal burden in 2018 (Figure 6).
- Other disease groups that contributed substantially to fatal burden were injuries, neurological conditions and respiratory diseases.

Figure 6: Proportion (%) of fatal burden (YLL), by disease group and sex, 2018



- In Australians aged under 45, injuries (suicide & self-inflicted injuries, poisoning, road traffic injuries), cancers (brain/central nervous system, bowel and breast cancer) and infant & congenital conditions were among the main specific causes of fatal burden.
- In those aged 45 and over, coronary heart disease, cancers (lung, bowel, breast and pancreatic cancer), dementia, stroke and COPD were the leading specific causes of fatal burden.

A large proportion of burden could be prevented

- In 2018, 38% of the total burden of disease (DALY), 48% of all fatal burden (YLL) and 28% of all non-fatal burden (YLD) experienced by Australians could have been prevented by avoiding or reducing exposure to the risk factors included in this study.
- The 5 risk factors that caused the most total burden in 2018 were tobacco use (responsible for 8.6% of total burden), overweight (including obesity) (8.4%), dietary risks (5.4%), high blood pressure (5.1%) and alcohol use (4.5%). Of the dietary risk factors, a diet low in legumes contributed the most to total burden (1.2%).
- Tobacco use was the leading contributor to fatal burden (contributing almost 20,500 attributable deaths and 13% of all YLL), followed by overweight (including obesity) (9.6% of YLL).
- For non-fatal burden, overweight (including obesity) was the leading contributor (7.4% of YLD), followed by tobacco use (4.4% of YLD) (Table 1).

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

	Total burden (DALY)		Fatal burden (YLL)		Non-fatal burden (YLD)	
Rank	Risk factor	% of burden	Risk factor	% of burden	Risk factor	% of burden
1	Tobacco use	8.6	Tobacco use	13.3	Overweight (including obesity)	7.4
2	Overweight (including obesity)	8.4	Overweight (including obesity)	9.6	Tobacco use	4.4
3	Dietary risks	5.4	Dietary risks	8.8	High blood plasma glucose	3.7
4	High blood pressure	5.1	High blood pressure	8.1	Alcohol use	3.4
5	Alcohol use	4.5	Alcohol use	5.6	Child abuse & neglect	2.7
	All risk factors (joint effect)	*37.5*	*All risk factors (joint effect)*	*48.0*	*All risk factors (joint effect)*	*28.0*

Contribution of risk factors to total burden differs by disease group

- Tobacco use contributed to 39% of the total burden from respiratory diseases and 22% of the total burden from cancers.
- Overweight (including obesity) contributed to 44% of the total burden from endocrine disorders, 31% of the total burden from kidney & urinary diseases and 22% of the total cardiovascular disease burden.
- High blood pressure and dietary risks also contributed highly to the total burden of cardiovascular diseases (35% and 31%, respectively).
- The proportion of total burden attributable to alcohol use was highest for injuries (15%), followed by mental health conditions & substance use disorders (11%).

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.

Key changes in population health since 2003

Overall total burden of disease has reduced

After accounting for the increase in size and ageing of the population (by using age standardised rates), there was a 13% decrease in the rate of total burden between 2003 and 2018 (from 209 to 182 DALY per 1,000 population, Figure 7). Most of this decline was observed between 2003 and 2011. There was a 2.8% decrease (from 187 to 182 DALY per 1,000) between 2015 and 2018.

Large reduction in burden from dying prematurely

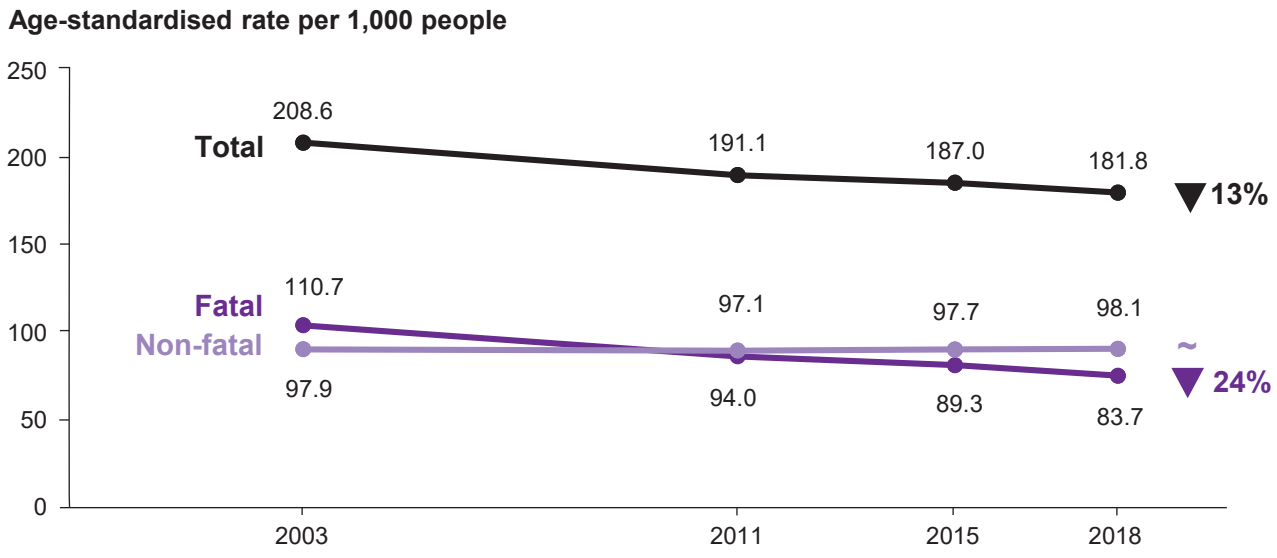
The improvement in total burden resulted from a large reduction (24%) in the age standardised rate of fatal burden (from 111 to 84 YLL per 1,000 population, Figure 7) between 2003 and 2018. This was due to preventing or delaying deaths from many diseases and injuries.

At the disease group level, there were large reductions in the rates of fatal burden from cardiovascular diseases (45%), infectious diseases (39%), infant & congenital conditions (31%), cancers (22%) and injuries (10%). There was an increase in the rate of fatal burden due to neurological conditions (31%).

No improvements in burden from living with disease

The age-standardised rate of non-fatal burden was very similar between 2003 and 2018 (97.9 and 98.1 YLD per 1,000 population, Figure 7). Non-fatal burden rates increased for some disease groups, including endocrine disorders (22%) and hearing & vision disorders (12%), but reduced for cardiovascular diseases (22%) and musculoskeletal conditions (5.0%).

Figure 7: Change between 2003 and 2018 in the age-standardised total burden (DALY), fatal burden (YLL) and non-fatal burden (YLD) rate (per 1,000 population)



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

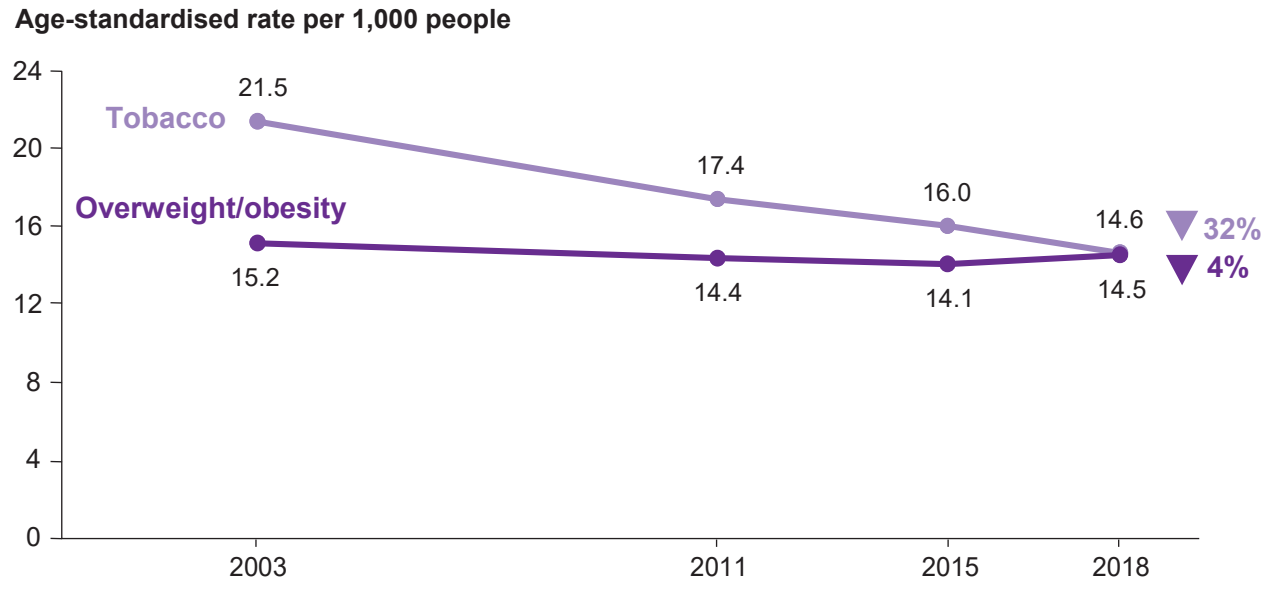
Reductions in total burden due to some risk factors

Between 2003 and 2018, there was a small decrease in the proportion of total burden attributable to the risk factors measured at both time points (from 37% in 2003 to 35% in 2018). This decrease reflects reductions in exposure to the risk factors, or reductions in burden from the linked diseases, or both. Note that high blood plasma glucose, air pollution and low birthweight & short gestation could not be measured for 2003 and were therefore excluded from the comparison between 2003 and 2018. When these 3 risk factors are included in the 2018 estimates, the proportion of total burden attributable to all risk factors increases to 38%.

After accounting for population growth and ageing between 2003 and 2018 (using age standardised rates), there was a substantial fall in the rate of total burden attributable to tobacco use (from 21 to 15 DALY per 1,000; 32%). This change is largely a result of declines in smoking prevalence and the major linked diseases. The rate of total burden attributable to overweight (including obesity) was relatively steady over time (from 15.2 to 14.5 per 1,000) (Figure 8). This trend is partly a result of increases in the rates of burden attributable to obesity and some linked diseases such as dementia, in combination with decreases in the rates of burden attributable to overweight (excluding obesity) and linked diseases such as cardiovascular diseases.

Other risk factors in which there were notable changes in age-standardised DALY rates over time include: high blood pressure (decrease from 16 to 8.4 per 1,000; 49%), high cholesterol (decrease from 10 to 4.7 per 1,000; 53%), dietary risks (decrease from 16 to 9.2 per 1,000; 42%), physical inactivity (decrease from 6.1 to 4.0 per 1,000; 34%) and illicit drug use (increase from 4.5 to 6.0 per 1,000; 35%).

Figure 8: Change between 2003 and 2018 in the age-standardised attributable DALY rate (per 1,000 population) for the leading 2 risk factors in 2018

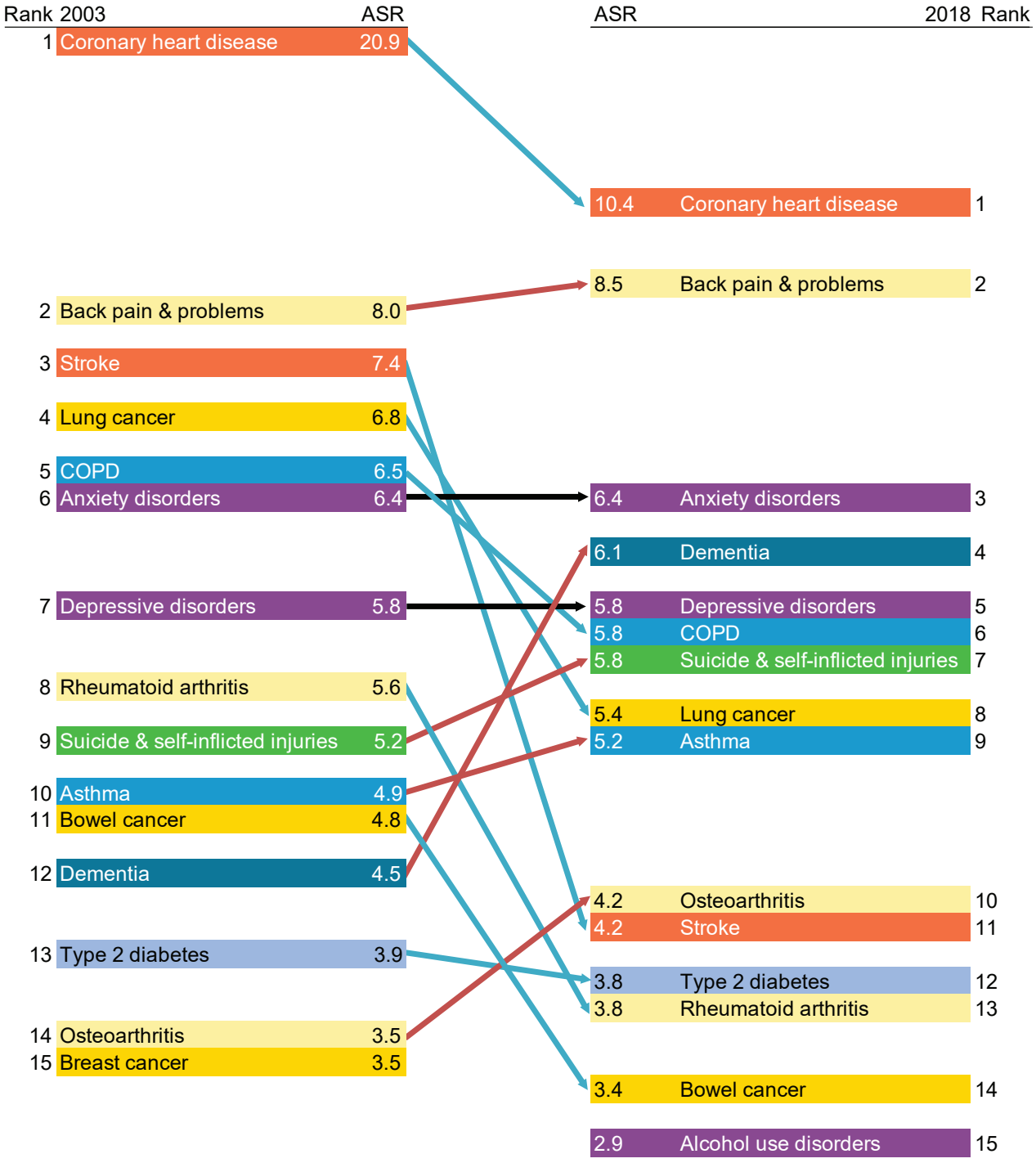


Note: Rates were age-standardised to the 2001 Australian Standard Population.

Changes in total burden of specific diseases

- The 15 specific diseases which caused the highest rate of total burden (age-standardised DALY rate) remained largely the same between 2003 and 2018 (Figure 9).
- Coronary heart disease had the largest reduction in DALY rate between 2003 and 2018, but remained the leading cause of total burden in both years.
- Other diseases that had lower DALY rates in 2018 than in 2003 were stroke, COPD, lung, bowel and breast cancer and rheumatoid arthritis.
- The DALY rate for dementia increased, which may be partly due to changes in the practices of coding deaths due to dementia since 2006. Rates also increased for back pain & problems, suicide & self-inflicted injuries, asthma and osteoarthritis.

Figure 9: Change in disease ranking and age-standardised DALY rate (per 1,000 population) between 2003 and 2018



ASR = age-standardised rate; COPD = chronic obstructive pulmonary disease.

Notes:

1. Diseases are presented in descending order, from highest ASR to lowest ASR, with arrows indicating either an increase (red), decrease (blue) or no change (black) in the ASR over time.
2. There were changes in practices of coding deaths due to dementia; therefore, caution is recommended when interpreting changes over time for dementia burden.
3. Rates were age-standardised to the 2001 Australian Standard Population.

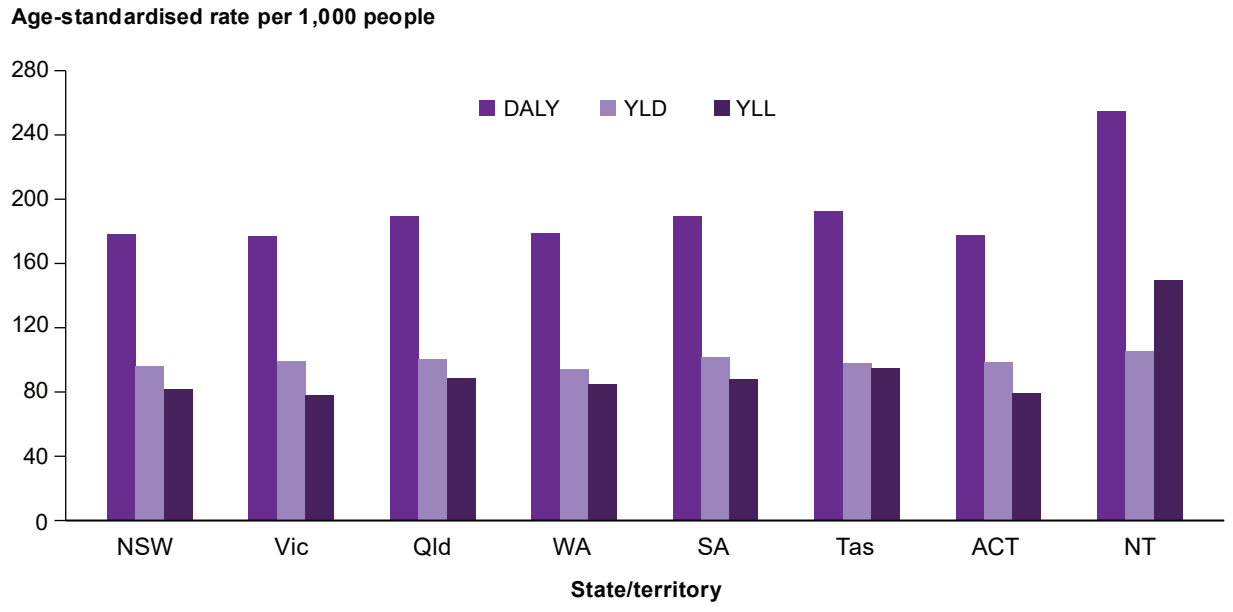
Geographic and population differences in burden

Burden of disease varies greatly across different geographic areas and population groups of interest. This variation results from a complex interaction of many factors, including demographic, socioeconomic and environmental differences between these groups. For example, compared to other states and territories, the Northern Territory has the smallest population, but also a younger population and a higher proportion identifying as Aboriginal or Torres Strait Islander. This section compares how states and territories, remoteness areas and socioeconomic groups experience burden of disease differently. For comparisons of burden of disease between Indigenous and non-Indigenous Australians, key findings have been released (AIHW 2021e) and detailed findings will be published in 2022 (AIHW forthcoming 2022).

State and territory

- The rate of total, fatal and non-fatal burden was similar across all states and territories, except for the Northern Territory where the age-standardised DALY rate was 1.4 times as high as the national rate. This was mainly due to a much higher rate of fatal burden in the Northern Territory (Figure 10). The Northern Territory was the only jurisdiction where the rate of fatal burden was higher than the rate of non-fatal burden.
- The Northern Territory had higher rates of DALY for most disease groups—in particular, from kidney & urinary diseases, blood & metabolic disorders, injuries, infectious diseases and endocrine disorders (which includes diabetes)—than other jurisdictions, but lower rates of total burden from musculoskeletal conditions.

Figure 10: DALY, YLD and YLL age-standardised rates (per 1,000 population), by state or territory, 2018



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

- When looking at the leading 5 causes of total burden for states and territories (Figure 11):
  - coronary heart disease was the leading cause of total burden across all jurisdictions except for the Australian Capital Territory, where back pain & problems was the leading cause of total burden
  - back pain & problems, COPD and dementia were ranked in the top 5 for most jurisdictions
  - anxiety disorders were ranked third and fourth, respectively, for the Australian Capital Territory and Victoria; depressive disorders were ranked fourth in Western Australia and fifth in Victoria
  - suicide & self-inflicted injuries was ranked second, third and fifth, respectively, for the Northern Territory, Western Australia and Queensland
  - lung cancer was ranked third in the Northern Territory and fifth in New South Wales, South Australia and Tasmania
  - the Northern Territory was the only jurisdiction where type 2 diabetes was ranked in the top 5.

Figure 11: Leading causes of total burden (proportion %; age-standardised DALY rate as DALY per 1,000 population), by state or territory, 2018

Rank	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
	State/territory								
1st	Coronary heart disease (6.3%; 10.1)	Coronary heart disease (6.1%; 10.0)	Coronary heart disease (6.3%; 11.1)	Coronary heart disease (6.3%; 10.6)	Coronary heart disease (6.3%; 10.1)	Coronary heart disease (7.4%; 12.6)	Back pain and problems (5.2%; 9.2)	Coronary heart disease (8.3%; 21.8)	Coronary heart disease (6.3%; 10.4)
2nd	Dementia (4.3%; 6.3)	Back pain and problems (4.9%; 9.1)	Back pain and problems (4.4%; 8.7)	Back pain and problems (5.1%; 9.2)	Dementia (5.2%; 7.4)	COPD (4.4%; 7.0)	Coronary heart disease (4.9%; 8.7)	Suicide/self-inflicted injuries (4.5%; 9.6)	Back pain and problems (4.5%; 8.5)
3rd	Back pain and problems (4.0%; 7.7)	Dementia (3.9%; 5.9)	Dementia (3.7%; 6.3)	Suicide/self-inflicted injuries (3.5%; 6.8)	Back pain and problems (4.2%; 8.8)	Back pain and problems (4.3%; 9.4)	Anxiety disorders (4.8%; 8.4)	Lung cancer (3.6%; 9.8)	Dementia (4.0%; 6.1)
4th	COPD (3.6%; 5.8)	Anxiety disorders (3.7%; 7.2)	COPD (3.6%; 6.2)	Depressive disorders (3.4%; 6.5)	COPD (3.7%; 5.8)	Dementia (4.2%; 6.5)	Dementia (3.8%; 6.7)	COPD (3.4%; 10.5)	COPD (3.5%; 5.8)
5th	Lung cancer (3.3%; 5.5)	Depressive disorders (3.6%; 7.1)	Suicide/self-inflicted injuries (3.5%; 7.5)	COPD (3.1%; 5.2)	Lung cancer (3.1%; 5.2)	Lung cancer (3.5%; 5.5)	COPD (3.1%; 5.5)	Type 2 diabetes (3.1%; 9.1)	Lung cancer (3.2%; 5.4)

COPD = chronic obstructive pulmonary disease.

Notes:

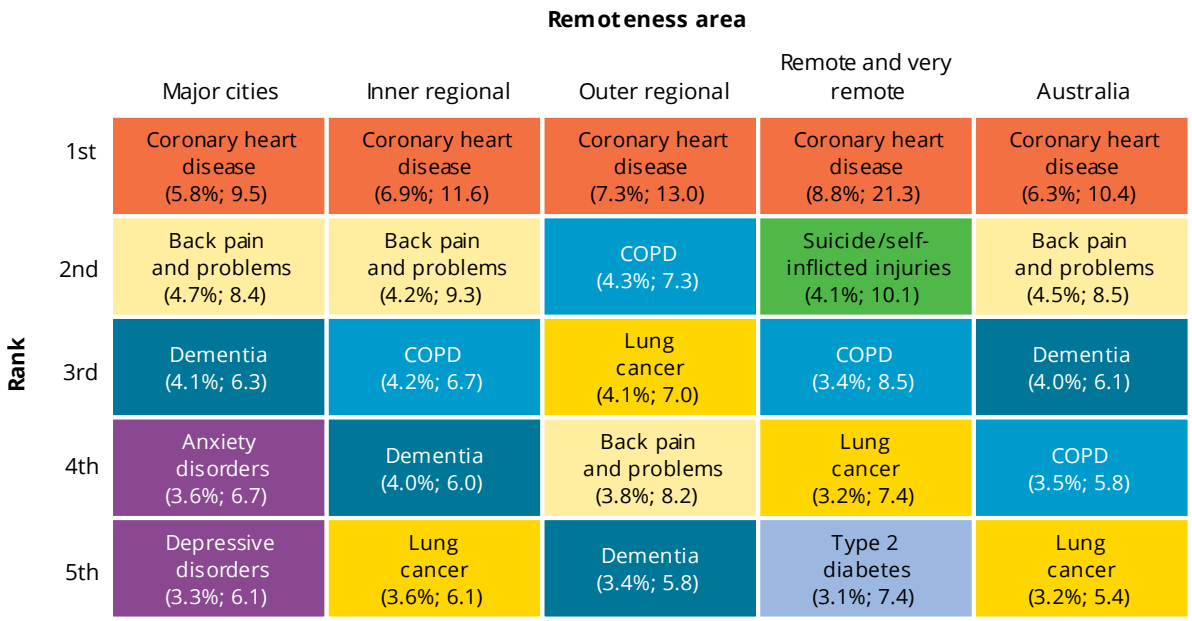
1. Diseases/injuries ranked by proportion of total burden.
2. Disease rankings exclude 'other' residual conditions from each disease group; for example, 'other musculoskeletal conditions'.
3. Rates were age-standardised to the 2001 Australian Standard Population.

Remoteness area

Remoteness areas, which are classified as *Major cities*, *Inner regional*, *Outer regional*, *Remote* and *Very remote* areas in this study, are defined by an area's relative distance to services. Results for *Remote* and *Very remote* areas are combined and reported as *Remote and very remote*. Differences in population structure, education and employment opportunities and access to health services contribute to variations in burden experienced across remoteness areas.

- The age-standardised rate of total burden (DALY) increased substantially from *Major cities* to the more remote areas. In 2018, *Remote and very remote* areas experienced a DALY rate 1.4 times as high as for *Major cities*.
- Total burden in Australia would be 4.4% lower if all remoteness areas had the same rates of total burden as *Major cities*. This excess burden is mainly fatal.
- Most disease groups caused higher rates of total burden with increasing remoteness area. In particular, people in *Remote and very remote* areas experienced much higher rates of total burden than those in *Major cities* from kidney & urinary diseases (2.7 times as high), injuries (2.4) and infectious diseases (2.3).
- When looking at the leading 5 causes of total burden for remoteness areas (Figure 12):
  - coronary heart disease caused the most total burden for all remoteness areas
  - back pain & problems and dementia were ranked among the top 5 for all areas except *Remote and very remote*, whereas COPD and lung cancer were ranked among the top 5 for all areas except *Major cities*
  - *Major cities* was the only area where anxiety disorders and depressive disorders were in the top 5
  - *Remote and very remote* was the only area where suicide & self-inflicted injuries and type 2 diabetes were in the top 5.

Figure 12: Leading causes of total burden (proportion %; age-standardised DALY rate as DALY per 1,000 population), by remoteness area, 2018



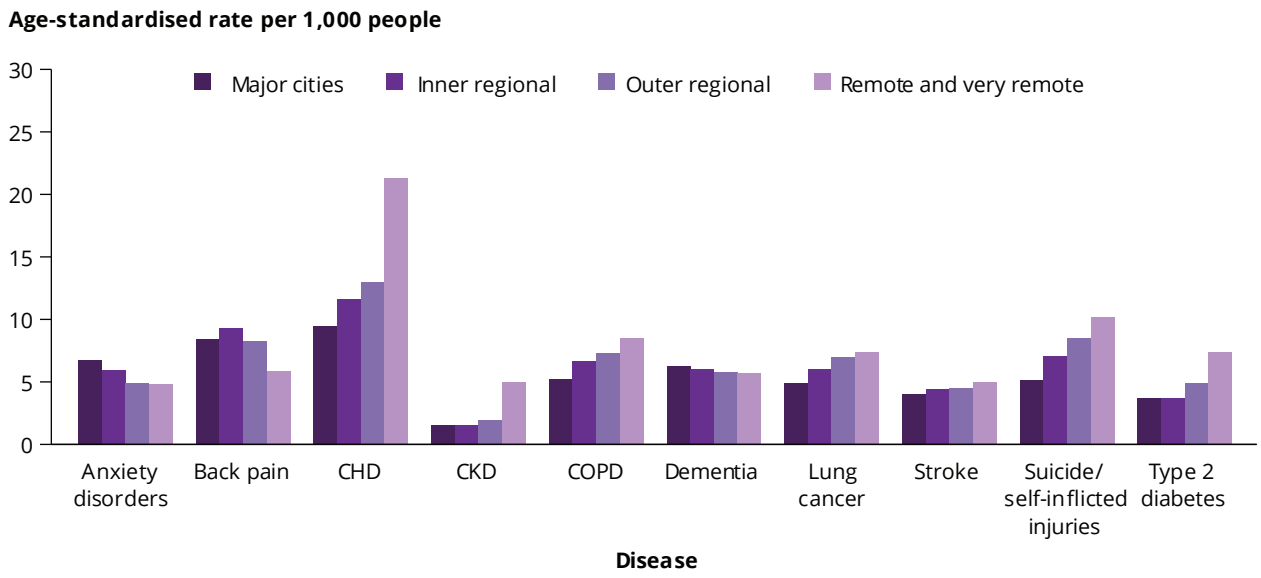
COPD = chronic obstructive pulmonary disease.

Notes:

1. Diseases/injuries ranked by proportion of total burden.
2. Disease rankings exclude 'other' residual conditions from each disease group; for example, 'other musculoskeletal conditions'.
3. Rates were age-standardised to the 2001 Australian Standard Population.

- For selected diseases, there was a strong gradient in total burden across remoteness areas (Figure 13):
  - DALY rates for coronary heart disease, chronic kidney disease, COPD, lung cancer, stroke, suicide & self-inflicted injuries and type 2 diabetes increased from *Major cities* to *Remote and very remote* areas
  - DALY rates for anxiety disorders and dementia declined steadily from *Major cities* to *Remote and very remote* areas
  - DALY rates for back pain & problems increased from *Major cities* to *Inner regional areas*, but then decreased from *Inner regional* to *Remote and very remote areas*.

Figure 13: Age-standardised DALY rates (per 1,000 population), for selected diseases, by remoteness area, 2018



CHD = coronary heart disease; CKD = chronic kidney disease; COPD = chronic obstructive pulmonary disease.

Note: Rates were age-standardised to the 2001 Australian Standard Population and are expressed as DALY per 1,000 population.

Socioeconomic groups

Socioeconomic groups reported in this study are 5 equally sized population groups (1–5) classified by the Index of Relative Socio-economic Disadvantage. The lowest socioeconomic group (1) represents people living in areas with the most socioeconomic disadvantage and the highest socioeconomic group (5) represents those living in areas with the least disadvantage.

- The age-standardised rate of total burden (DALY) increased steadily with increasing disadvantage, from 142 DALY per 1,000 population in the highest socioeconomic group to 223 per 1,000 population in the lowest socioeconomic group.
- Overall, the rate of total burden for people in the most disadvantaged group was 1.6 times as high as the rate for people in the least disadvantaged group.
- The total burden of disease in Australia would be 21% lower if all socioeconomic groups had the same rate of total burden as the highest socioeconomic group.
- Looking at the leading 5 causes of total burden for socioeconomic groups (Figure 14):
  - coronary heart disease and back pain & problems were ranked as the first and second leading causes of total burden, respectively, across all socioeconomic groups
  - dementia was ranked among the top 5 causes of total burden in all socioeconomic groups; COPD was ranked in the top 5 for most socioeconomic groups (1, 2, 3 and 5)
  - lung cancer was ranked fifth in the lowest socioeconomic groups (1 and 2), but was not in the leading 5 causes for the higher socioeconomic groups (3, 4 and 5)
  - anxiety disorders was among the leading causes of total burden for the higher socioeconomic groups (3, 4 and 5), however, the lowest socioeconomic group had the highest age-standardised rate for anxiety disorders, as seen in Figure 15.

Figure 14: Leading causes of total burden (proportion %; age-standardised DALY rate as DALY per 1,000 population), by socioeconomic group, 2018

Rank	1 Lowest	2	3	4	5 Highest	Australia
	Socioeconomic group					
1st	Coronary heart disease (7.2%; 14.7)	Coronary heart disease (6.5%; 11.4)	Coronary heart disease (6.1%; 10.1)	Coronary heart disease (5.5%; 8.8)	Coronary heart disease (5.5%; 7.2)	Coronary heart disease (6.3%; 10.4)
2nd	Back pain and problems (4.0%; 9.6)	Back pain and problems (4.2%; 9.0)	Back pain and problems (4.6%; 8.6)	Back pain and problems (4.9%; 8.4)	Back pain and problems (4.8%; 7.0)	Back pain and problems (4.5%; 8.5)
3rd	COPD (3.9%; 7.5)	Dementia (4.1%; 6.4)	Dementia (3.8%; 6.0)	Anxiety disorders (3.9%; 6.9)	Dementia (4.6%; 5.7)	Dementia (4.0%; 6.1)
4th	Dementia (3.7%; 6.6)	COPD (3.8%; 6.4)	Anxiety disorders (3.5%; 6.8)	Dementia (3.8%; 5.9)	Anxiety disorders (3.3%; 5.1)	COPD (3.5%; 5.8)
5th	Lung cancer (3.7%; 7.4)	Lung cancer (3.6%; 6.3)	COPD (3.4%; 5.5)	Depressive disorders (3.2%; 5.5)	COPD (3.2%; 4.3)	Lung cancer (3.2%; 5.4)

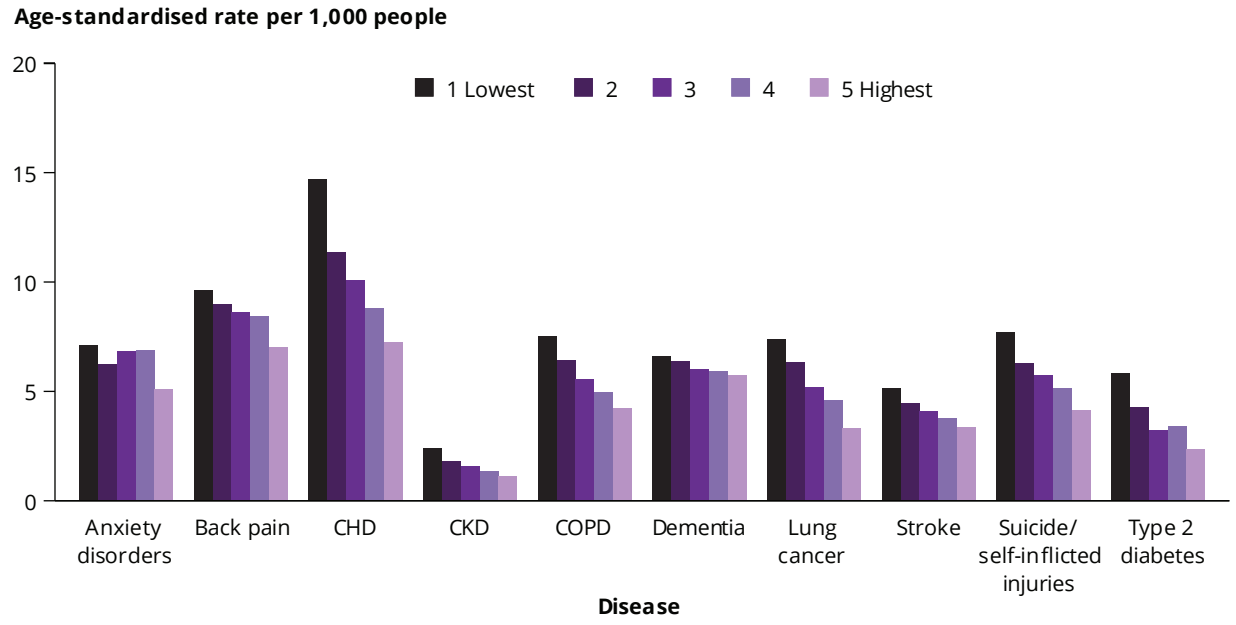
COPD = chronic obstructive pulmonary disease.

Notes:

1. Diseases/injuries ranked by proportion of total burden.
2. Disease rankings exclude 'other' residual conditions from each disease group; for example, 'other musculoskeletal conditions'.
3. Rates were age-standardised to the 2001 Australian Standard Population.

- For many diseases, including back pain & problems, coronary heart disease, chronic kidney disease, COPD, dementia, lung cancer, stroke, suicide & self-inflicted injuries and type 2 diabetes, there was a strong gradient of decreasing DALY rates with increasing socioeconomic advantage (Figure 15).

Figure 15: Age-standardised DALY rates (per 1,000 population), for selected diseases, by socioeconomic group, 2018



CHD = coronary heart disease; CKD = chronic kidney disease; COPD = chronic obstructive pulmonary disease.

Note: Rates were age-standardised to the 2001 Australian Standard Population and are expressed as DALY per 1,000 population.

- For risk factors where it was possible to estimate total attributable burden by socioeconomic group:
  - there was a strong socioeconomic gradient in burden caused by all the risk factors, with the least disadvantaged socioeconomic groups having lower rates of total attributable burden
  - DALY rates due to tobacco use were 3.0 times higher in the most disadvantaged socioeconomic group compared with the least disadvantaged group. Intimate partner violence and high blood plasma glucose (including diabetes) also caused large relative disparities in total burden (both 2.5 times higher in the most disadvantaged compared with the least disadvantaged group).

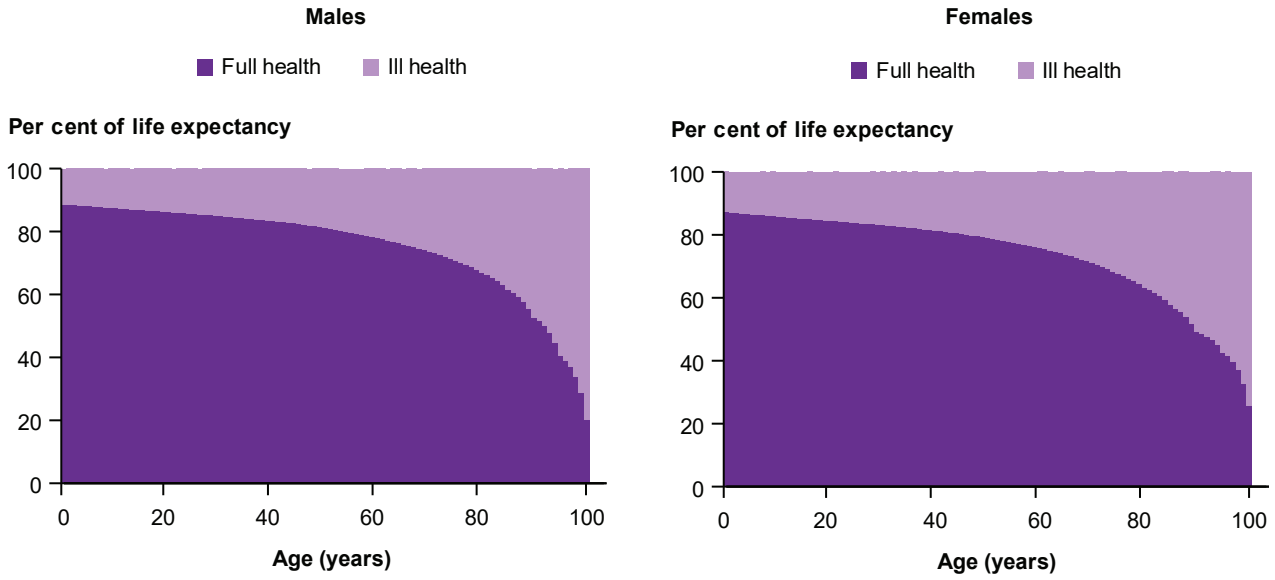
Measuring the health-adjusted life expectancy

The health-adjusted life expectancy (HALE) uses 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 changes in life expectancy and HALE over time shows whether longer life expectancy is accompanied by more or less years lived in full health.

On average, almost 90% of years lived are in full health

- Life expectancy for males and females born in 2018 was 80.7 years and 84.9 years, respectively. HALE for males born in 2018 was 71.5 years and for females was 74.1 years. On average, males and females born in 2018 could expect to live 89% and 87% of their lives in full health, respectively.
- Between 2003 and 2018, HALE at birth increased by 2.1 years for males and 1.2 years for females, however, the average proportion of life spent in full health remained largely the same for males, and decreased slightly for females.
- The proportion of remaining years males and females could expect to live in full health reduced with age (Figure 16). Australians aged 65 could, on average, expect to live 75% of their remaining life in full health.

Figure 16: Percentage of remaining life expectancy in full health and ill health at each age, by sex, 2018



HALE is unequal between population groups

- In 2018, males and females living in *Major Cities* had a longer life expectancy and HALE at birth and age 65, than males and females living in *Remote and very remote* areas.
- Males and females in the highest (least disadvantaged) socioeconomic group had a longer life expectancy and HALE at birth (Figure 17), as well as at age 65, than their counterparts in the lowest (most disadvantaged) group.

Figure 17: Expected years lived in full health and ill health (and proportion of life lived in full health), by sex and socioeconomic group, 2018

- Between 2011 and 2018:
  - life expectancy and HALE at birth increased for people living in *Major Cities* as well as those living in *Remote and very remote* areas. The gap in HALE at birth between those living in *Major Cities* and those in *Remote and very remote* areas reduced from 6.9 to 5.2 years for females and from 5.8 to 5.1 years for males, suggesting a narrowing of the gap over time
  - life expectancy at birth increased for the highest and lowest socioeconomic groups, however, the gap in HALE between these groups increased from 4.4 to 5.9 years in females and from 6.2 to 6.8 years in males, suggesting a widening of the gap over time
  - the proportion of life expectancy (at birth) lived in full health remained the same for males and females in the highest socioeconomic group (90% and 89%, respectively) and for males in the lowest socioeconomic group (88%), but declined slightly for females in the lowest socioeconomic group (from 87% to 86%).

Where can I find out more?

For more information on burden of disease in Australia, see:

- Australian Burden of Disease Study: impact and causes of illness and death in Australia 2018.
- Australian Burden of Disease Study: methods and supplementary material 2018.
- Australian Burden of Disease Study 2018: Interactive data on disease burden.
- Australian Burden of Disease Study 2018: Interactive data on risk factor burden.
- Australian Burden of Disease Study 2018: impact and causes of illness and death in Aboriginal and Torres Strait Islander people.
- Disease expenditute in Australian 2018–19.

Visit Burden of disease for more on this topic.

References

AIHW (Australian Institute of Health and Welfare) 2021a. Australian Burden of Disease Study: impact and causes of illness and death in Australia 2018. Australian Burden of Disease Study series no. 23. Cat. no. BOD 29. Canberra: AIHW.

AIHW 2021b. Australian Burden of Disease Study: methods and supplementary material 2018. Australian Burden of Disease Study series no. 21. Cat. no. BOD 26. Canberra: AIHW.

AIHW 2021c. Australian Burden of Disease Study 2018: Interactive data on disease burden. Australian Burden of Disease Study series no. 28. Cat. no. BOD 34. Canberra: AIHW.

AIHW 2021d. Australian Burden of Disease Study 2018: Interactive data on risk factor burden. Australian Burden of Disease Study series no. 29. Cat. no. BOD 35. Canberra: AIHW.

AIHW 2021e. Australian Burden of Disease Study 2018: key findings for Aboriginal and Torres Strait Islander people. Cat. no. BOD 28. Canberra: AIHW.

AIHW 2021f. Disease expenditure in Australia 2018–19. Cat. no. HWE 81. Canberra: AIHW.

AIHW forthcoming 2022. Australian Burden of Disease Study 2018: impact and causes of illness and death in Aboriginal and Torres Strait Islander people. Cat. no. BOD 32. Canberra: AIHW.

Abbreviations

ACT	Australian Capital Territory
COPD	chronic obstructive pulmonary disease
DALY	disability-adjusted life years
HALE	health-adjusted life expectancy
NSW	New South Wales
NT	Northern Territory
Qld	Queensland
SA	South Australia
Tas	Tasmania
Vic	Victoria
WA	Western Australia
YLD	years lived with disability
YLL	years of life lost

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This summary report presents key findings from the *Australian Burden of Disease Study: impact and causes of illness and death in Australia 2018*. It provides estimates of the burden due to 219 diseases and injuries in Australia and the contribution of various modifiable risk factors to this burden. An analysis of the change in burden of disease between 2003 and 2018 is also presented.

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