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AIHW

Australian Burden of Disease Study

Impact and causes
of illness and death
in Australia 2015

Summary report



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In 2015, Australians lost 4.8 million years of healthy life (DALY) due to:

Living with illness (non-fatal)
50.4% of total burden

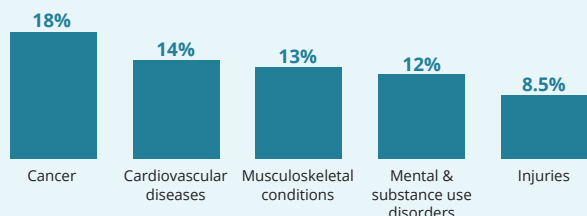


Dying prematurely (fatal)
49.6% of total burden



Chronic diseases and injuries accounted for most of the burden

The leading 5 disease groups causing burden:

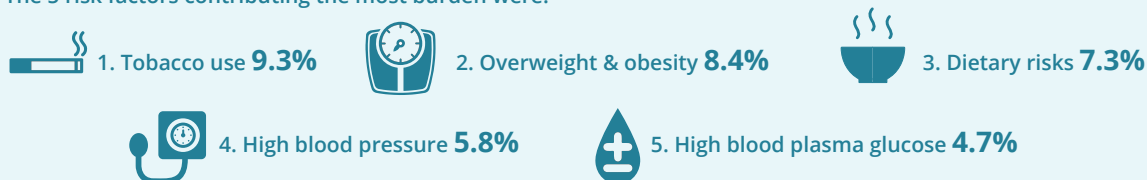


The leading 5 diseases causing burden:

1. Coronary heart disease **6.9%**
2. Back pain & problems **4.1%**
3. Chronic obstructive pulmonary disease (COPD) **3.9%**
4. Dementia **3.8%**
5. Lung cancer **3.3%**

Exposure to risk factors contributed 38% of the total burden

The 5 risk factors contributing the most burden were:



Burden differs across geographic areas and population groups

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



1.5 x

Highest socioeconomic group



There were **substantial improvements** in population health between 2003 and 2015 with:



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

- Cardiovascular diseases
- Cancer
- Musculoskeletal conditions
- Infant and congenital conditions



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 amount of 'disability-adjusted life years' (DALY) experienced by the 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 216 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 2015

The ABDS 2015 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 since the ABDS 2011. This new study provides estimates for the reference year 2015 and recalculations of the 2011 and 2003 estimates using new data sources and methods, where applicable. Several key improvements were adopted for the ABDS 2015 compared with the ABDS 2011. These improvements were: developing a more comprehensive list of diseases and risk factors, adopting new conceptual models for some diseases, using better data sources (more linked data) to estimate disease burden and estimating a new measure—the health-adjusted life expectancy (HALE). See Chapter 5 of the ABDS 2015 detailed report for more information on HALE.

Burden of disease summary measures

Attributable burden: The amount of burden that could be reduced if exposure to the risk factor had been avoided.

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

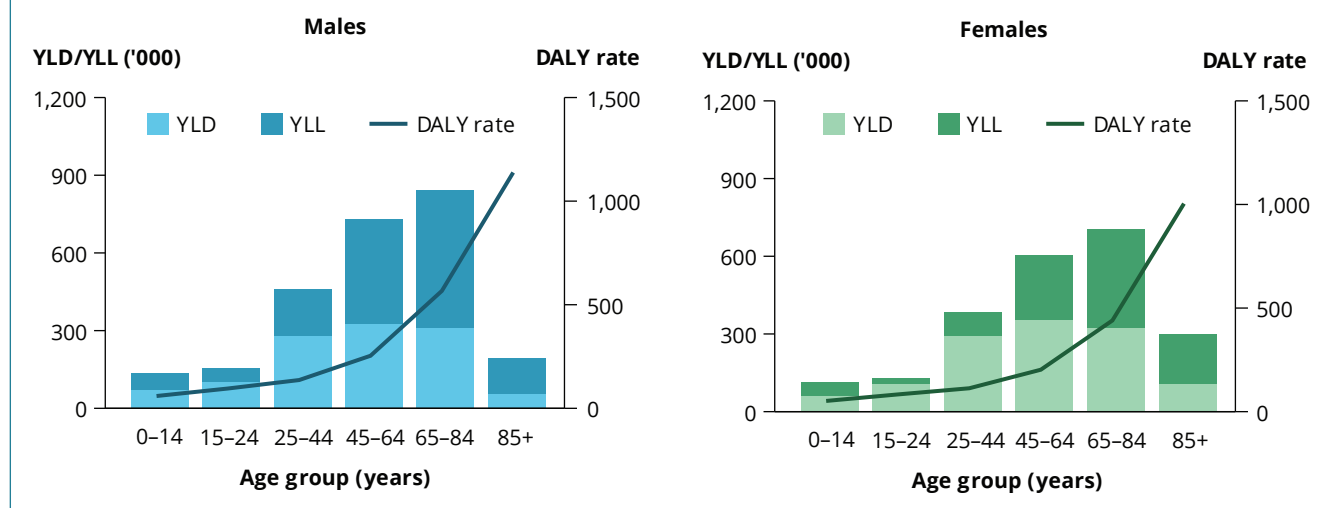
Years of life lost (YLL): A measure of the years of life lost due to premature death, defined as dying before the ideal life span. YLL represent fatal burden.

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 is referred to as health loss.

Total burden across the life course

- In 2015, there were 199 years of healthy life lost for every 1,000 people in Australia due to living with or dying prematurely from disease and injury. This is equivalent to 4.8 million DALY for the whole Australian population.
- Total burden of disease (DALY) was low in young Australians and greater in the older age groups, except for those aged 85 and over, where the burden was much lower due to a smaller population (Figure 1).
- The rate of health loss (that is, the number of DALY per 1,000 population) 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.

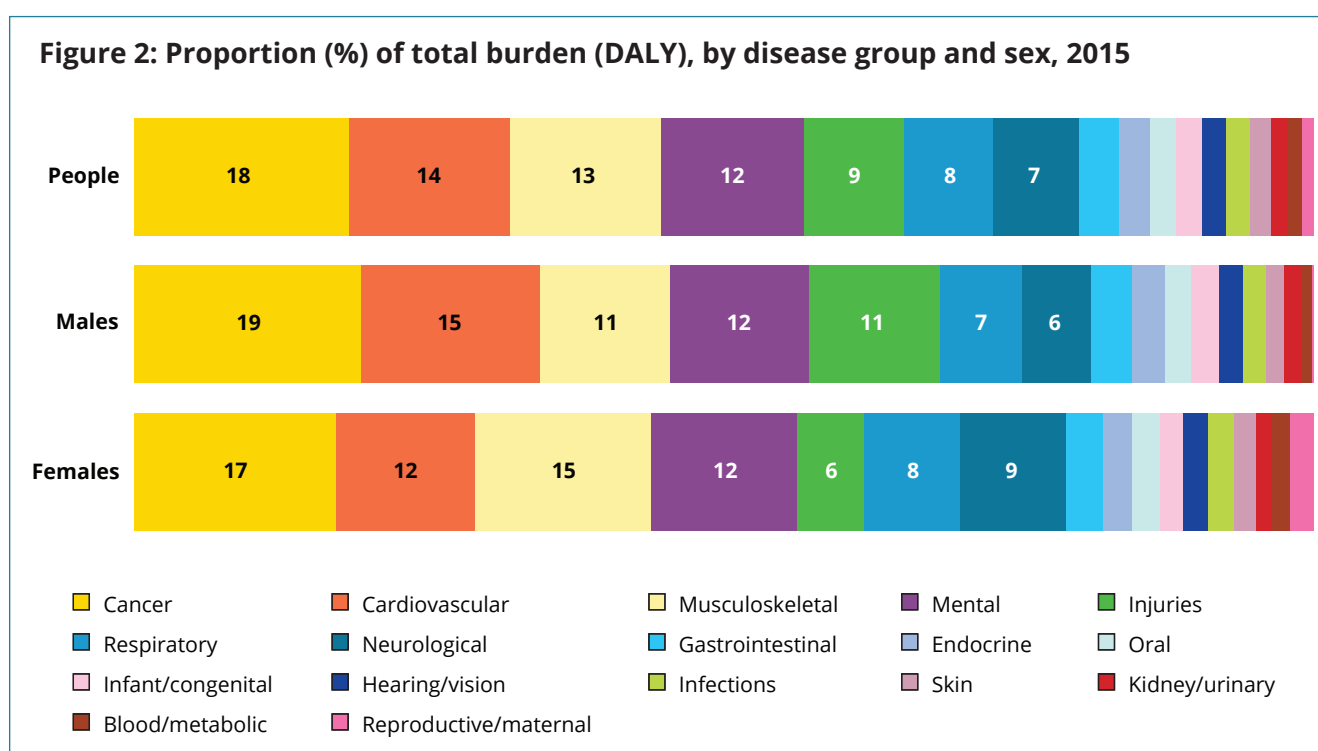
Figure 1: Non-fatal (YLD) and fatal (YLL) composition of the total burden (DALY), and DALY rates (DALY per 1,000 population), by sex and age group, 2015



- Children aged under 15 experienced around half of their total burden from living with illness (YLD) and half from dying prematurely (YLL). In people aged 15–44, ill health accounted for more burden than dying prematurely. However, older Australians (aged 65 and over) experienced a higher proportion of fatal burden than non-fatal burden.
- Males experienced more burden (DALY) than females for all age groups up to 85, due to males having more fatal burden than females in these age groups.

Chronic disease and injury dominate

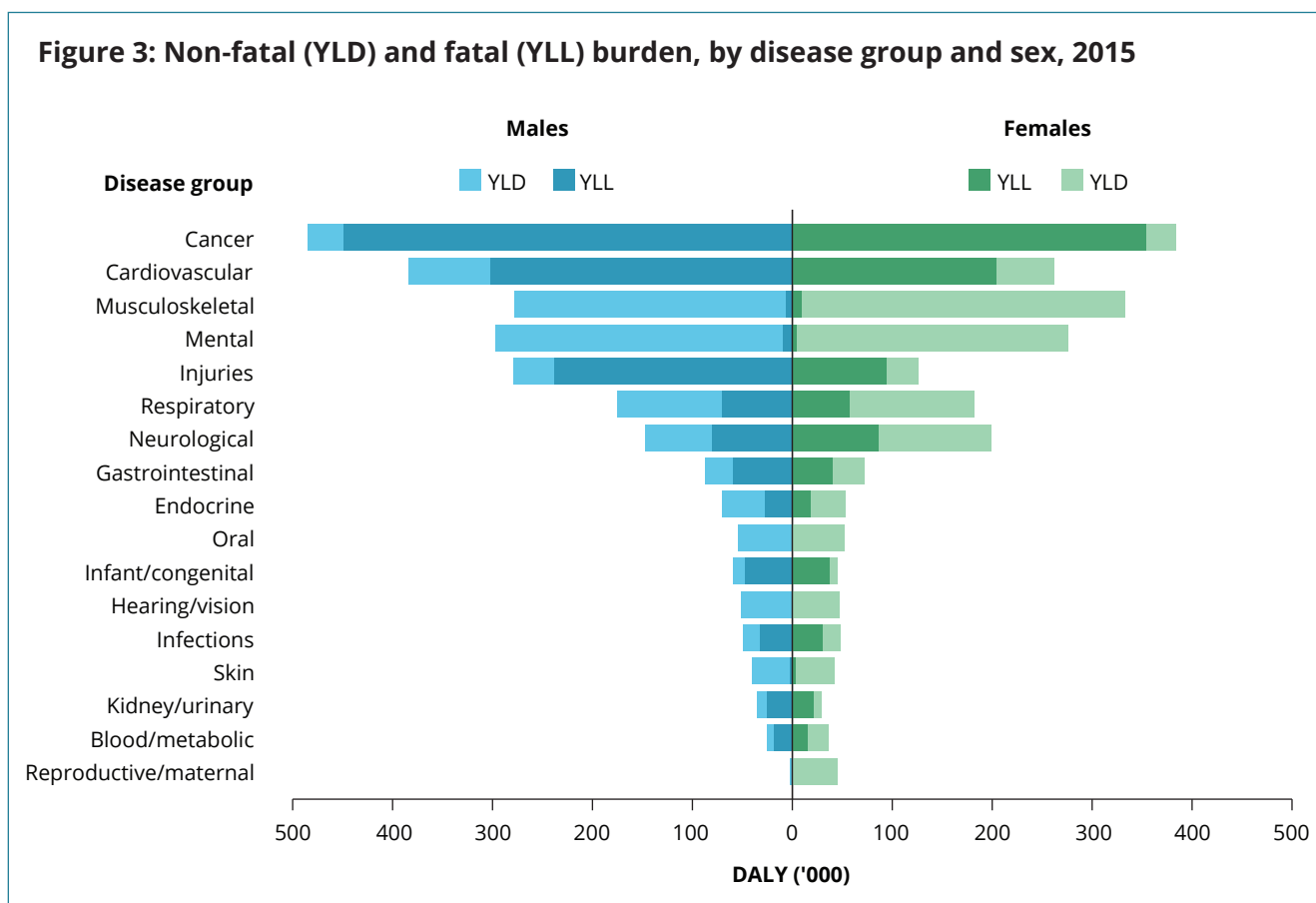
- The disease groups causing the most burden (DALY) in 2015 were cancer (18% of the total burden), cardiovascular diseases (14%), musculoskeletal conditions (13%), mental & substance use disorders (12%) and injuries (8.5%) (Figure 2). Together, they accounted for around two-thirds of the total burden in Australia.
- Males and females experienced the majority of their 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 and neurological conditions accounted for more of the total burden in females (Figure 2).
- At the individual disease level, the leading 5 causes of burden were coronary heart disease (6.9% of total burden), back pain & problems (4.1%), chronic obstructive pulmonary disease (COPD) (3.9%), dementia (3.8%) and lung cancer (3.3%).



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

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

Figure 3: Non-fatal (YLD) and fatal (YLL) burden, by disease group and sex, 2015



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

While the overall burden of disease was split 53% to 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 cardiovascular diseases (59%), endocrine disorders (mostly diabetes) and infant & congenital conditions (57% each) and cancer (56%).
- Females had a greater share of the total burden from blood & metabolic disorders (which includes conditions such as iron-deficiency anaemia) (59%), neurological conditions (which includes dementia) (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 diseases that caused the most burden for different age groups.

Disease groups

- Infant & congenital conditions was the main cause of total burden in infants (80%).
- Mental & substance use disorders and injuries together accounted for 45% of the burden in Australians aged under 50 (excluding infants).
- Musculoskeletal conditions contributed to substantial burden for ages 10 to 84.
- Cancer and cardiovascular diseases were 2 main disease groups causing burden in Australians aged 50 and over. Cancer was the largest contributor of burden for people aged 65–69, while cardiovascular diseases contributed increasing proportions of burden with older age.
- Neurological conditions contributed substantial burden in Australians aged 75 and over.

Specific diseases/injuries

- **Ages under 5:**
 - Pre-term & low birthweight complications, birth trauma & asphyxia, sudden infant death syndrome, cardiovascular defects and asthma were the leading 5 causes of total burden for infants and young children.
- **Ages 5–14:**
 - Asthma (ranked as the leading cause), anxiety, depressive and conduct disorders were leading causes of burden for both boys and girls aged 5–14.
 - Boys also experienced substantial burden from autism spectrum disorders; for girls, dental caries was ranked among the leading 5 causes.
- **Ages 15–44:**
 - Suicide & self-inflicted injuries was the most burdensome disease for males, while anxiety disorders was the leading cause of burden for females.
 - Both males and females experienced substantial burden from depressive disorders and back pain & problems. Males also had high rankings for alcohol use disorders, motor vehicle accidents and poisoning while asthma was among the leading 5 causes for females.
- **Ages 45–64:**
 - Coronary heart disease and back pain & problems caused the most burden in men and women, respectively. Suicide & self-inflicted injuries and anxiety disorders were still among the leading 5 causes for men and women respectively, but each contributed to much lower proportions of the burden for ages 45–64 than for younger age groups.
 - Men also experienced substantial burden from lung cancer and chronic liver disease while women suffered substantial burden from breast cancer and osteoarthritis.

• **Ages 65 and over:**

- Coronary heart disease and dementia were both leading causes of burden in men and women aged 65 and over. Both sexes also experienced substantial burden from COPD and stroke.
- Lung cancer was ranked highly in men (fourth leading cause of burden) while osteoarthritis was ranked highly in women (fifth leading cause of burden).

Figure 4: Leading causes of total burden (DALY '000; proportion %), by sex and age group, 2015

		Age group (years)					
		Under 5	5–14	15–24	25–44	45–64	65+
Males	1st	Pre-term/lbw complications (10.3; 14.6%)	Asthma (9.2; 13.7%)	Suicide/self-inflicted injuries (19.7; 12.8%)	Suicide/self-inflicted injuries (47.7; 10.3%)	Coronary heart disease (72.2; 9.9%)	Coronary heart disease (131.5; 12.7%)
	2nd	Birth trauma/asphyxia (6.3; 9.0%)	Anxiety disorders (7.0; 10.5%)	Alcohol use disorders (11.1; 7.2%)	Back pain and problems (29.2; 6.3%)	Back pain and problems (37.2; 5.1%)	COPD (70.9; 6.8%)
	3rd	SIDS (3.9; 5.5%)	Conduct disorder (4.6; 6.9%)	RTI/motor vehicle occupant (8.7; 5.7%)	Alcohol use disorders (27.8; 6.0%)	Lung cancer (33.1; 4.5%)	Dementia (64.2; 6.2%)
	4th	Cardiovascular defects (3.7; 5.2%)	Depressive disorders (4.1; 6.1%)	Depressive disorders (8.3; 5.4%)	Poisoning (27.2; 5.9%)	Suicide/self-inflicted injuries (26.9; 3.7%)	Lung cancer (55.8; 5.4%)
	5th	Asthma (2.6; 3.8%)	Autism spectrum disorders (3.6; 5.3%)	Back pain and problems (7.8; 5.1%)	Depressive disorders (25.9; 5.6%)	Chronic liver disease (24.2; 3.3%)	Stroke (45.4; 4.4%)
Females	1st	Pre-term/lbw complications (7.0; 12.3%)	Asthma (7.0; 12.4%)	Anxiety disorders (14.5; 11.3%)	Anxiety disorders (36.3; 9.5%)	Back pain and problems (36.1; 6.0%)	Dementia (105.9; 10.6%)
	2nd	Birth trauma/asphyxia (6.2; 10.9%)	Anxiety disorders (6.1; 10.8%)	Depressive disorders (11.4; 8.9%)	Back pain and problems (30.4; 7.9%)	Breast cancer (33.7; 5.6%)	Coronary heart disease (90.1; 9.0%)
	3rd	Cardiovascular defects (2.5; 4.3%)	Depressive disorders (4.7; 8.3%)	Asthma (9.2; 7.1%)	Depressive disorders (30.1; 7.8%)	Osteoarthritis (31.7; 5.3%)	COPD (62.4; 6.2%)
	4th	SIDS (2.3; 4.1%)	Dental caries (2.9; 5.2%)	Back pain and problems (7.7; 6.0%)	Asthma (19.1; 5.0%)	Anxiety disorders (28.0; 4.6%)	Stroke (53.2; 5.3%)
	5th	Asthma (2.0; 3.6%)	Conduct disorder (2.8; 4.9%)	Suicide/self-inflicted injuries (7.6; 6.0%)	Suicide/self-inflicted injuries (13.8; 3.6%)	Lung cancer (26.9; 4.5%)	Osteoarthritis (37.4; 3.7%)

lbw = low birthweight; RTI = road traffic injuries; SIDS = sudden infant death syndrome.

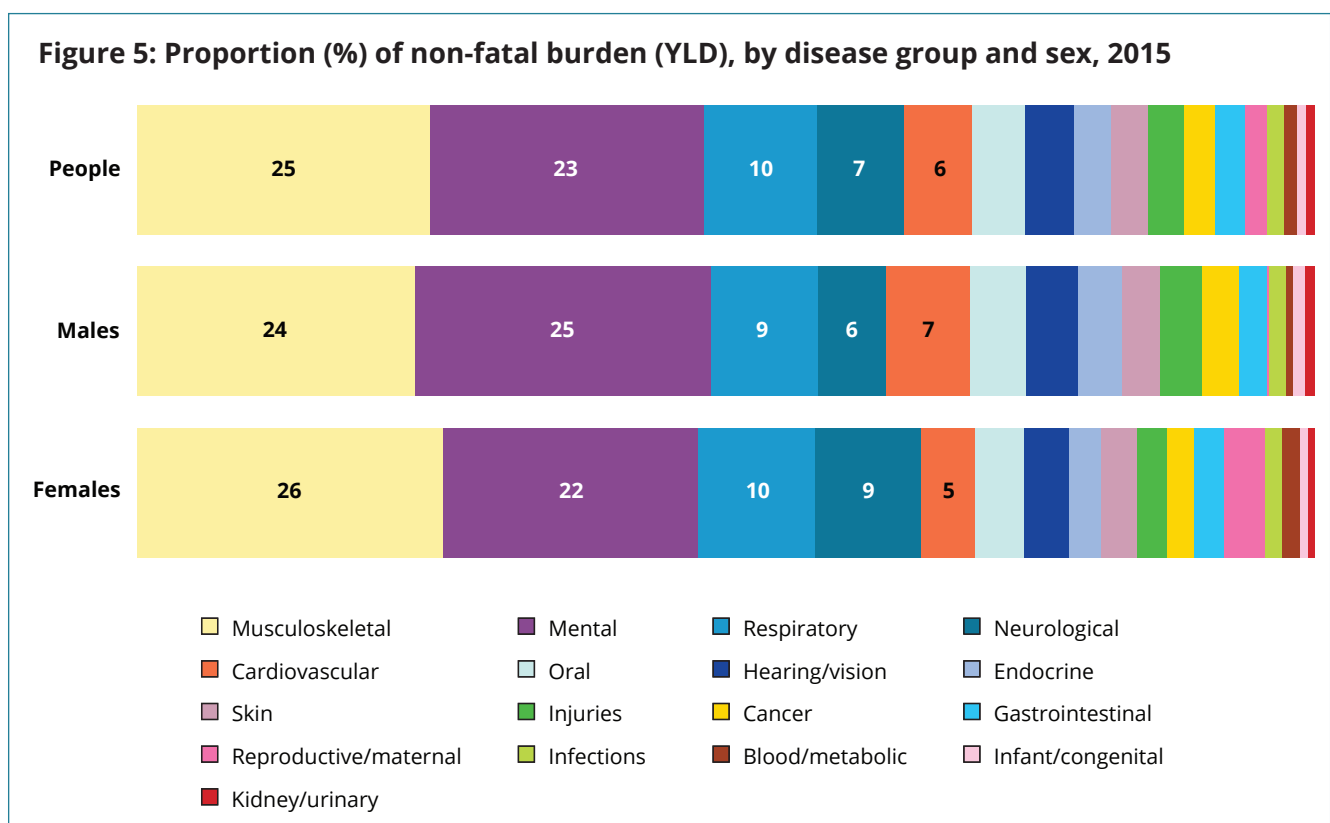
Note: Disease rankings exclude 'other' residual conditions from each disease group; for example, 'other musculoskeletal conditions'.

Impact of living with disease and injury

- In 2015, Australians lost 2.4 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 (50.4%) 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.

Mental and musculoskeletal conditions were the main causes of non-fatal burden

- The top 2 disease groups—mental & substance use disorders and musculoskeletal conditions—together accounted for 49% of the non-fatal burden in males and 48% in females (Figure 5).
- Respiratory diseases, neurological conditions and cardiovascular diseases were other main disease groups contributing to non-fatal burden. Together, they accounted for 22% of non-fatal burden in males and 24% in females.



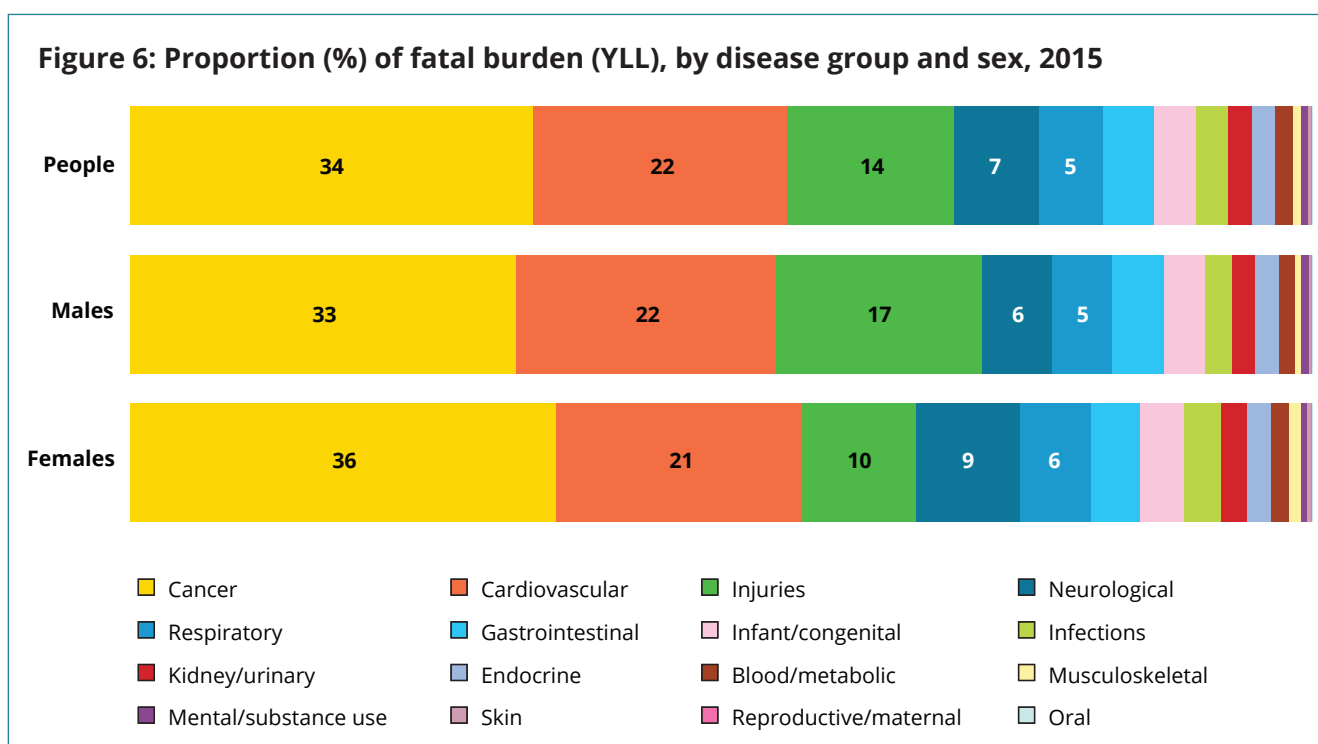
- The leading 3 diseases causing non-fatal burden for both males and females were back pain & problems, anxiety and depressive disorders. Asthma also ranked as a highly burdensome disease for both sexes (fourth in males and fifth in females).
- Compared with females, males suffered substantially more non-fatal burden from alcohol use disorders and coronary heart disease, while females experienced more burden from osteoarthritis, rheumatoid arthritis and dementia.

Impact of dying prematurely

- In 2015, there were more than 157,000 deaths in Australia, which resulted in 2.4 million years of life lost (fatal burden, YLL). Fatal burden accounted for 49.6% of the total burden of disease (DALY).
- Males experienced more fatal burden than females (58% compared with 42%). After adjusting for differences in age, the fatal burden rate was 60% higher in males (110 YLL per 1,000 population) than in females (69 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 to large fatal burden. However, a small number of deaths (<1%) in infants also caused substantial burden 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% of male burden; 36% for females) and cardiovascular diseases (22% for males; 21% for females) caused most of the fatal burden in 2015 (Figure 6).
- Other disease groups that contributed substantially to fatal burden were injuries, neurological conditions and respiratory diseases.








- In Australians aged under 45, injuries (including suicide & self-inflicted injuries, road traffic injuries, poisoning and homicide & violence) and cancers (including brain/central nervous system cancer, various leukaemias, bowel and breast cancer) were some of the main causes of fatal burden.
- In those aged 45 and over, coronary heart disease, various cancers (lung, bowel, breast and prostate cancer), stroke and dementia were the leading causes of fatal burden. COPD also contributed to substantial fatal burden for both men and women.

A large proportion of burden could be prevented

- Thirty eight per cent of the total burden of disease (DALY) experienced by Australians in 2015 could have been prevented by reducing exposure to the risk factors included in this study.
- The 5 risk factors that caused the most burden in 2015 were tobacco use (responsible for 9.3% of total burden), overweight & obesity (8.4%), dietary risks (7.3%), high blood pressure (5.8%) and high blood plasma glucose including diabetes (4.7%) (Table 1).
- Tobacco use contributed to 41% of all respiratory burden and 22% of all cancer burden. Overweight & obesity contributed to 45% of the burden from endocrine disorders, over a third of the burden from kidney & urinary diseases and 19% of the cardiovascular disease burden. Dietary risks were responsible for a third of the burden from endocrine disorders and over two-fifths of the burden from cardiovascular diseases.

Table 1: Proportion (%) of total burden (DALY) attributable to the leading risk factors, for selected disease groups, 2015

Disease group	 Tobacco use	 Overweight & obesity	 Dietary risks	 High blood pressure	 High blood plasma glucose
<i>Proportion of total burden</i>					
All diseases	9.3	8.4	7.3	5.8	4.7
<i>Proportion of disease group burden</i>					
Cancer	22.1	7.8	4.2	..	2.9
Cardiovascular	11.5	19.3	40.2	38.0	4.9
Neurological	1.5	9.0	0.2	1.8	2.9
Respiratory	41.0	8.0	0.3
Endocrine	3.7	44.6	34.2	..	98.0
Kidney/urinary	..	35.6	7.7	34.1	53.7

Notes

1. Estimates for diet are based on an analysis of the joint effects of all dietary risk factors included in the study following methods used in recent global burden of disease studies.
2. Blank cells '.' indicate that the risk factor has no associated diseases or injuries in the disease group.

Why risk factor estimates cannot be added together

The estimates for different risk factors cannot simply be added to derive their total DALY, due to 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. While there are known *associations* between risk factors with many diseases and conditions, burden was attributed to a risk factor only where there is sufficient evidence that the risk factor *causes* the disease.

Key changes in population health since 2003

Overall burden of disease has reduced

After accounting for the increase in size and ageing of the population (by using age-standardised rates), there was an 11% decrease in the rate of burden (DALY) between 2003 and 2015 (from 208 to 184 DALY per 1,000 population).

Large reduction in burden from dying prematurely

Most of the improvement in total burden resulted from a large reduction (20%) in the age-standardised rate of fatal burden (from 111 to 89 YLL per 1,000 population) between 2003 and 2015. This was due to preventing or delaying deaths from many diseases and injuries.

At the disease group level, there were large absolute reductions in the rate of fatal burden from cardiovascular diseases, cancer, infant & congenital conditions and injuries, but a substantial increase in the fatal burden rate from neurological conditions.

Limited improvements in burden from living with disease

The overall age-standardised rate of non-fatal burden was similar between 2003 and 2015 (97 and 95 YLD per 1,000 population, a 2% reduction). Non-fatal burden rates increased slightly for mental & substance use disorders, endocrine disorders and neurological conditions, but reduced for musculoskeletal conditions and cardiovascular diseases.

Reductions in burden due to some risk factors

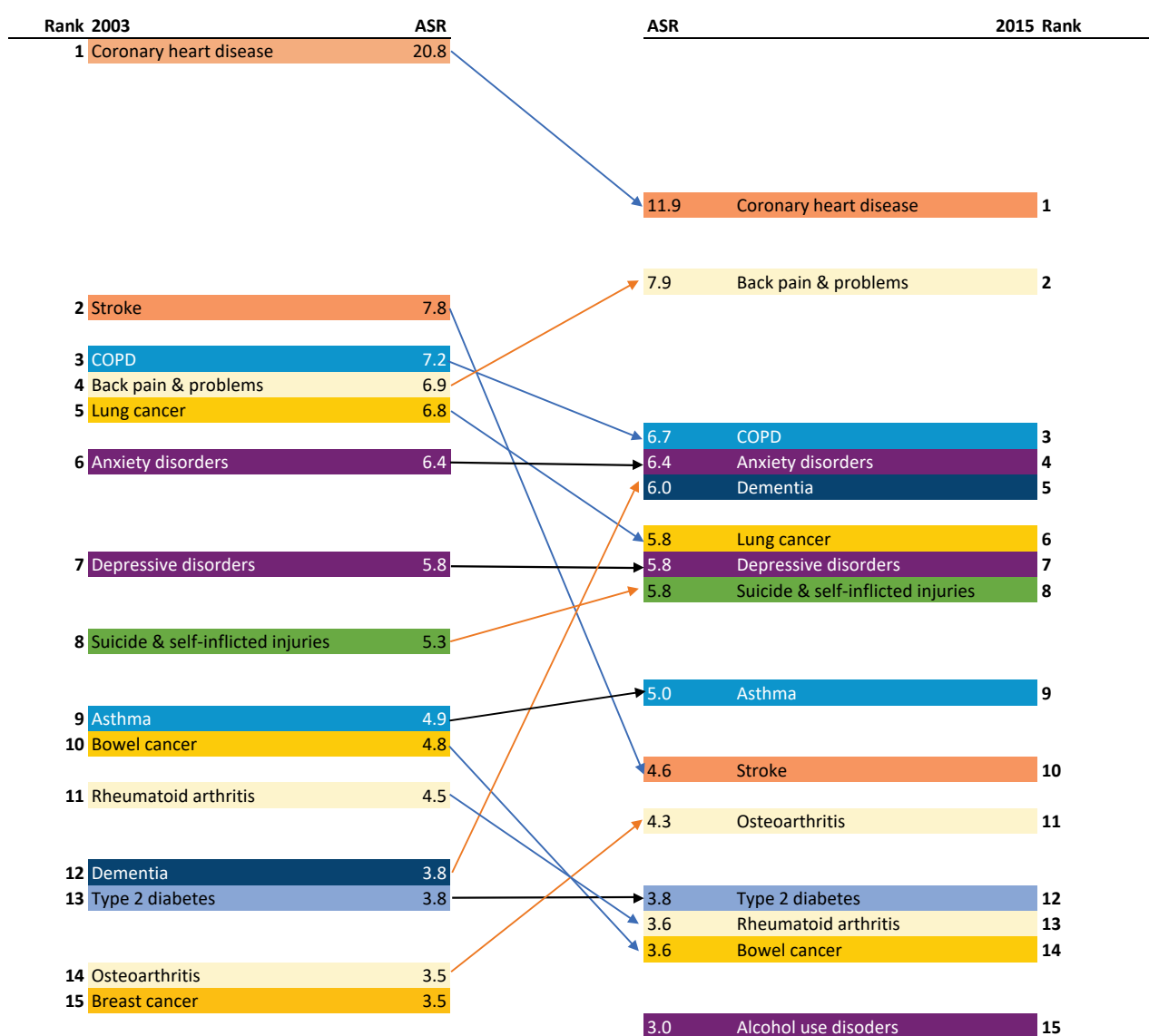
Between 2003 and 2015, there was a small decrease in the proportion of burden attributable to the risk factors measured at both time points (from 37% in 2003 to 36% in 2015). This reflects reductions in exposure to the risk factors, or reductions in burden from the linked diseases, or both. (Note that high blood plasma glucose and air pollution could not be measured for 2003 and were therefore excluded from the comparison between 2003 and 2015.)

After accounting for population increase and ageing between 2003 and 2015 (using age-standardised rates), there were notable falls in the rate of total burden (DALY) attributable to high cholesterol (decreased by 49%), high blood pressure (41%), dietary risks (34%) and tobacco use (24%). In contrast, the rate of burden attributable to illicit drug use increased by 18% between 2003 and 2015.

Changes in total burden of specific diseases

- The 15 diseases causing the highest rate of burden (age-standardised DALY rate) remained largely the same between 2003 and 2015 (Figure 7).
- Coronary heart disease had the largest reduction in DALY rate between 2003 and 2015, but remained as leading cause of burden in both years of study.
- Other diseases that had lower DALY rates were stroke, COPD, lung cancer, bowel cancer and rheumatoid arthritis.
- The DALY rate for dementia increased substantially, which may be partly due to changes in the practices of coding deaths due to dementia since 2006.
- Although type 2 diabetes had the same DALY rates over time, this resulted from an increase in burden from living with the disease and a simultaneous reduction in burden from dying prematurely due to the disease.

Figure 7: Change in disease ranking and age-standardised DALY rate (DALY per 1,000 population) between 2003 and 2015



ASR = age-standardised rate.

Note: There were changes in practices of coding deaths due to dementia; therefore, caution is recommended when interpreting changes over time for dementia burden.

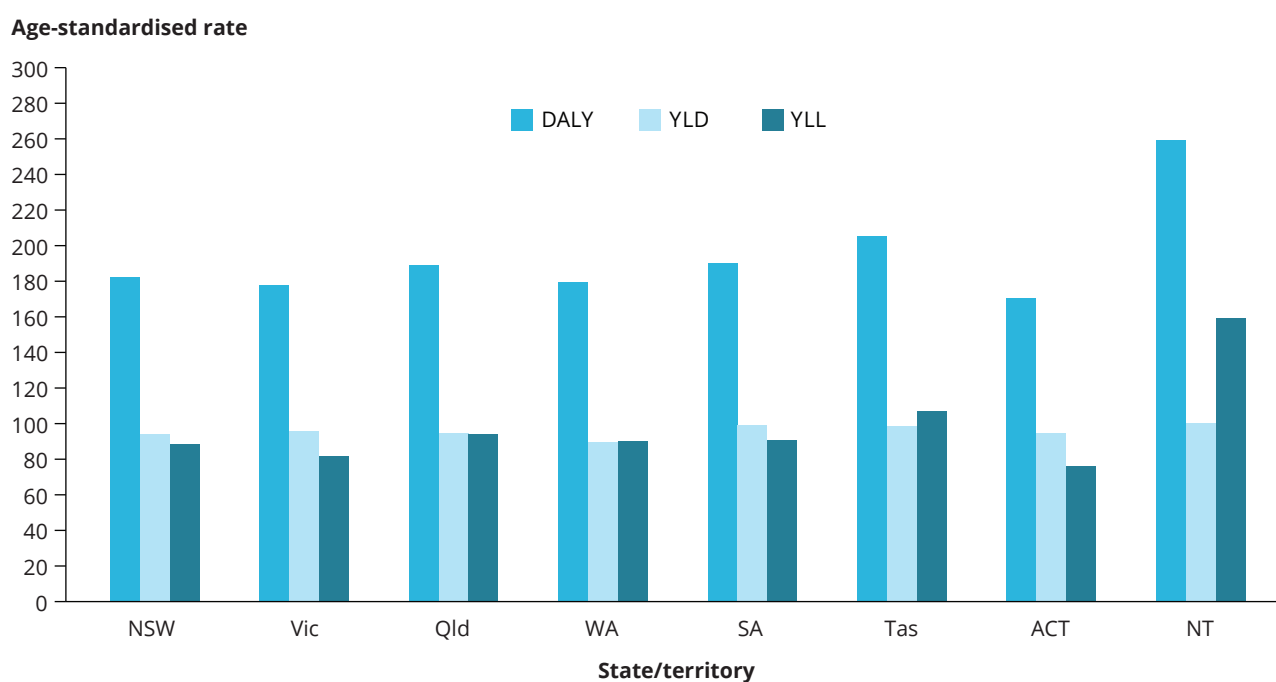
Geographic and population differences in burden

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. This section compares how jurisdictions, remoteness areas and socioeconomic groups experience burden of disease differently.

State and territory

- The rate of burden was similar across all states and territories, except 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 8).
- Northern Territory had higher rates of DALY for most disease groups—in particular, from kidney & urinary diseases, endocrine disorders (which includes diabetes), infections, injuries and cardiovascular diseases—than other jurisdictions, but lower rates of burden from musculoskeletal conditions.

Figure 8: DALY, YLD and YLL age-standardised rates (number per 1,000 population), by state or territory, 2015



- When looking at the leading 5 causes of burden for states and territories (Figure 9):
 - coronary heart disease was the leading cause of burden across all jurisdictions
 - back pain & problems (excluding for the Northern Territory) and COPD were other high burden diseases ranked in the top 5 for all jurisdictions
 - anxiety disorders was among the leading 5 causes of burden for Victoria and the Australian Capital Territory, depressive disorders featured as the fifth cause of burden for Western Australia, and suicide & self-inflicted injuries was ranked highly for Queensland, Western Australia and the Northern Territory
 - road traffic injuries to motor vehicle occupants and chronic kidney disease caused substantial burden in the Northern Territory, while asthma was a high burden disease for the Australian Capital Territory.

Figure 9: Leading causes of total burden (proportion %; age-standardised DALY rate as DALY per 1,000 population), by state or territory, 2015

		State/territory								
		NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Rank	1st	Coronary heart disease (7.2%; 12.0)	Coronary heart disease (6.5%; 10.7)	Coronary heart disease (6.9%; 12.5)	Coronary heart disease (6.8%; 11.9)	Coronary heart disease (7.3%; 12.2)	Coronary heart disease (7.2%; 12.9)	Coronary heart disease (5.2%; 9.0)	Coronary heart disease (9.4%; 26.7)	Coronary heart disease (6.9%; 11.9)
	2nd	Back pain and problems (4.1%; 7.8)	Back pain and problems (4.2%; 7.9)	Back pain and problems (4.1%; 8.0)	Back pain and problems (4.4%; 8.0)	Dementia (4.8%; 7.1)	Lung cancer (4.7%; 8.4)	Anxiety disorders (5.1%; 8.4)	Suicide/self-inflicted injuries (4.7%; 9.4)	Back pain and problems (4.1%; 8.0)
	3rd	Dementia (4.0%; 6.2)	Dementia (3.9%; 5.9)	COPD (3.9%; 7.0)	Suicide/self-inflicted injuries (3.9%; 7.2)	Back pain and problems (4.2%; 8.7)	COPD (4.5%; 8.0)	Back pain and problems (4.7%; 7.9)	COPD (4.1%; 13.5)	COPD (3.9%; 6.7)
	4th	COPD (4.0%; 6.8)	COPD (3.8%; 6.4)	Suicide/self-inflicted injuries (3.6%; 7.3)	COPD (3.5%; 6.3)	COPD (4.0%; 6.8)	Dementia (4.0%; 6.7)	COPD (3.4%; 6.0)	Chronic kidney disease (3.5%; 9.8)	Dementia (3.8%; 6.0)
	5th	Lung cancer (3.4%; 5.9)	Anxiety disorders (3.7%; 7.2)	Lung cancer (3.5%; 6.2)	Depressive disorders (3.5%; 6.4)	Lung cancer (3.1%; 5.3)	Back pain and problems (3.8%; 8.7)	Asthma (3.2%; 5.4)	RTI/motor vehicle occupant (3.2%; 6.2)	Lung cancer (3.3%; 5.8)

RTI = road traffic injuries.

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'.

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 burden (DALY) increased substantially from *Major cities* to the more remote areas. In 2015, *Remote and very remote* areas experienced a DALY rate 1.4 times as high as for *Major cities*.
- Total burden in Australia would be 4.3% lower if all remoteness areas had the same rates of burden as *Major cities*. This excess burden is mainly fatal.
- Most disease groups caused higher rates of burden with increasing remoteness area. In particular, people in *Remote and very remote* areas experienced much higher rates of burden than those in *Major cities* from kidney & urinary diseases (3.6 times as high), injuries (2.5) and infectious diseases (1.9).
- When looking at the leading 5 causes of burden for remoteness areas (Figure 10):
 - coronary heart disease caused the most burden for all remoteness areas. Back pain & problems, COPD and lung cancer (except in *Major cities*) were also ranked among the top 5
 - anxiety disorders caused substantial burden for *Major cities*; dementia was ranked among the leading 5 causes for both *Major cities* and *Inner regional* areas; and suicide & self-inflicted injuries was ranked highly for *Outer regional* and *Remote and very remote* areas.

Figure 10: Leading causes of total burden (proportion %; age-standardised DALY rate as DALY per 1,000 population), by remoteness area, 2015

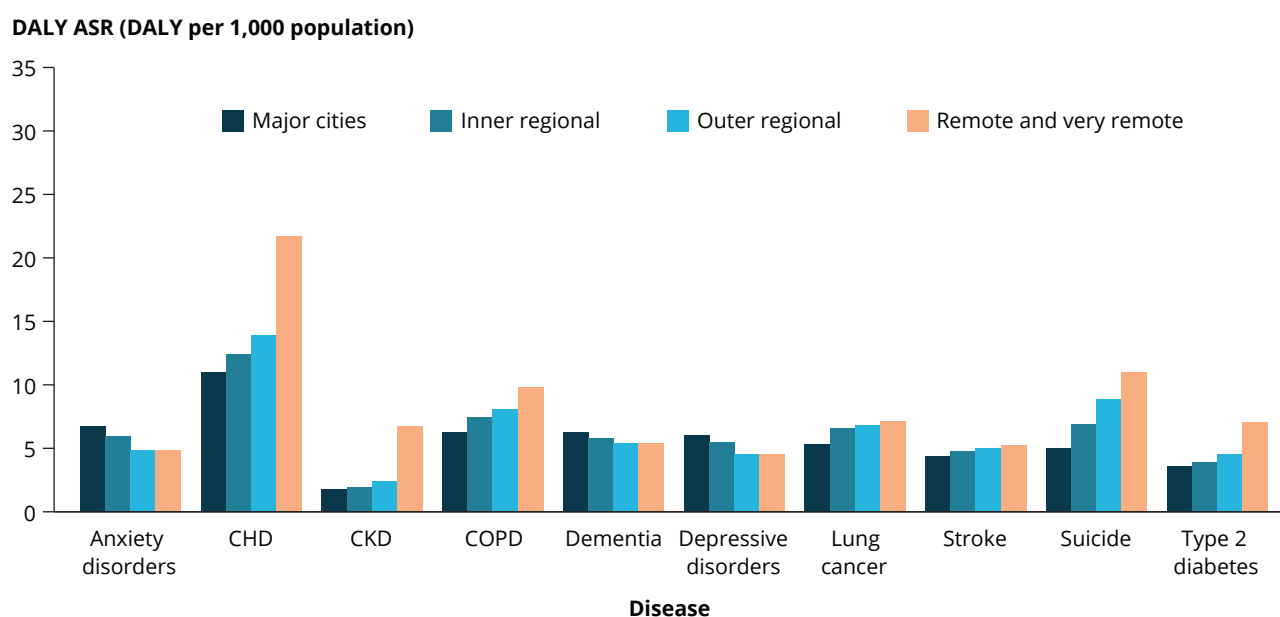
		Remoteness area				
						
		Major cities	Inner regional	Outer regional	Remote and very remote	Australia
Rank	1st	Coronary heart disease (6.6%; 11.0)	Coronary heart disease (7.3%; 12.4)	Coronary heart disease (7.7%; 13.9)	Coronary heart disease (8.6%; 21.7)	Coronary heart disease (6.9%; 11.9)
	2nd	Back pain and problems (4.4%; 7.9)	COPD (4.4%; 7.4)	COPD (4.5%; 8.0)	Suicide/self-inflicted injuries (4.5%; 11.0)	Back pain and problems (4.1%; 8.0)
	3rd	Dementia (4.0%; 6.2)	Back pain and problems (3.9%; 8.5)	Lung cancer (3.9%; 6.8)	COPD (3.6%; 9.8)	COPD (3.9%; 6.7)
	4th	COPD (3.7%; 6.2)	Lung cancer (3.8%; 6.6)	Suicide/self-inflicted injuries (3.5%; 8.8)	Back pain and problems (3.4%; 8.2)	Dementia (3.8%; 6.0)
	5th	Anxiety disorders (3.6%; 6.7)	Dementia (3.7%; 5.8)	Back pain and problems (3.4%; 7.4)	Lung cancer (2.9%; 7.1)	Lung cancer (3.3%; 5.8)

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'

- For selected diseases, there was a strong gradient in burden across remoteness areas (Figure 11):
 - 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, dementia and depressive disorders declined steadily from *Major cities* to *Remote and very remote areas* (Figure 11).

Figure 11: Age-standardised DALY rate of selected diseases, by remoteness area, 2015



CHD = coronary heart disease; CKD = chronic kidney disease; suicide = suicide & self-inflicted injuries.

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 burden (DALY) increased steadily from the highest socioeconomic group to the lowest socioeconomic group.
- Overall, the burden (DALY) rate for people in the most disadvantaged group was 1.5 times as high as the rate for people in the least disadvantaged group. However, this inequality in burden varied across the life course, with the youngest Australians experiencing a smaller gap than older Australians.
- The total burden in Australia would be 20% lower if all socioeconomic groups had the same rate of burden as the highest socioeconomic group.

- For risk factors where it was possible to estimate 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 burden
 - burden rates due to tobacco use were 2.6 times as high 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 burden (both 2.4 times as high in the most disadvantaged compared with the least disadvantaged group).
- Looking at the leading 5 causes of burden for socioeconomic groups (Figure 12):
 - coronary heart disease (ranked as the leading cause), back pain & problems, COPD and dementia were common high-burden diseases across all socioeconomic groups
 - lung cancer was ranked highly in the lowest socioeconomic groups (1 and 2), while anxiety disorders was among the top 5 for the higher socioeconomic groups (3, 4 and 5). Despite this, the age-standardised rate for anxiety disorders was higher in the lowest group than for other groups, reflected by the general decrease in anxiety burden rates across socioeconomic groups in Figure 13.

Figure 12: Leading causes of total burden (proportion %; age-standardised DALY rate as DALY per 1,000 population), by socioeconomic group, 2015

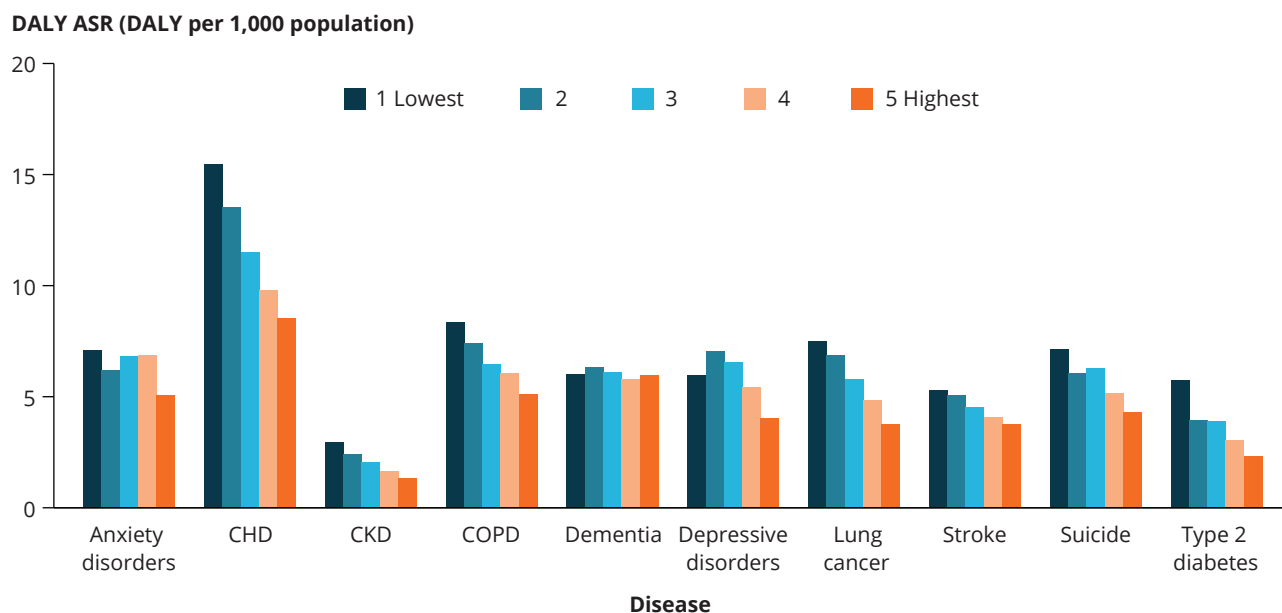
		Socioeconomic group					Australia
		1 Lowest	2	3	4	5 Highest	
Rank	1st	Coronary heart disease (7.7%; 15.5)	Coronary heart disease (7.4%; 13.5)	Coronary heart disease (6.7%; 11.5)	Coronary heart disease (6.1%; 9.8)	Coronary heart disease (6.2%; 8.5)	Coronary heart disease (6.9%; 11.9)
	2nd	COPD (4.3%; 8.4)	COPD (4.0%; 7.4)	Back pain and problems (4.0%; 7.8)	Back pain and problems (4.2%; 7.0)	Back pain and problems (5.3%; 7.9)	Back pain and problems (4.1%; 8.0)
	3rd	Back pain and problems (3.9%; 9.0)	Dementia (3.8%; 6.3)	Dementia (3.8%; 6.1)	Anxiety disorders (4.0%; 6.8)	Dementia (4.4%; 6.0)	COPD (3.9%; 6.7)
	4th	Lung cancer (3.7%; 7.5)	Back pain and problems (3.8%; 8.2)	COPD (3.7%; 6.5)	Dementia (3.7%; 5.8)	COPD (3.6%; 5.1)	Dementia (3.8%; 6.0)
	5th	Dementia (3.4%; 6.0)	Lung cancer (3.7%; 6.9)	Anxiety disorders (3.3%; 6.8)	COPD (3.7%; 6.1)	Anxiety disorders (3.3%; 5.1)	Lung cancer (3.3%; 5.8)

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'

- For many diseases, including coronary heart disease, chronic kidney disease, COPD, lung cancer, stroke and type 2 diabetes, there was a strong gradient of decreasing burden rates with increasing socioeconomic group (Figure 13).

Figure 13: Age-standardised DALY rate of selected diseases, by socioeconomic group, 2015



CHD = coronary heart disease; CKD = chronic kidney disease; suicide = suicide & self-inflicted injuries.

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

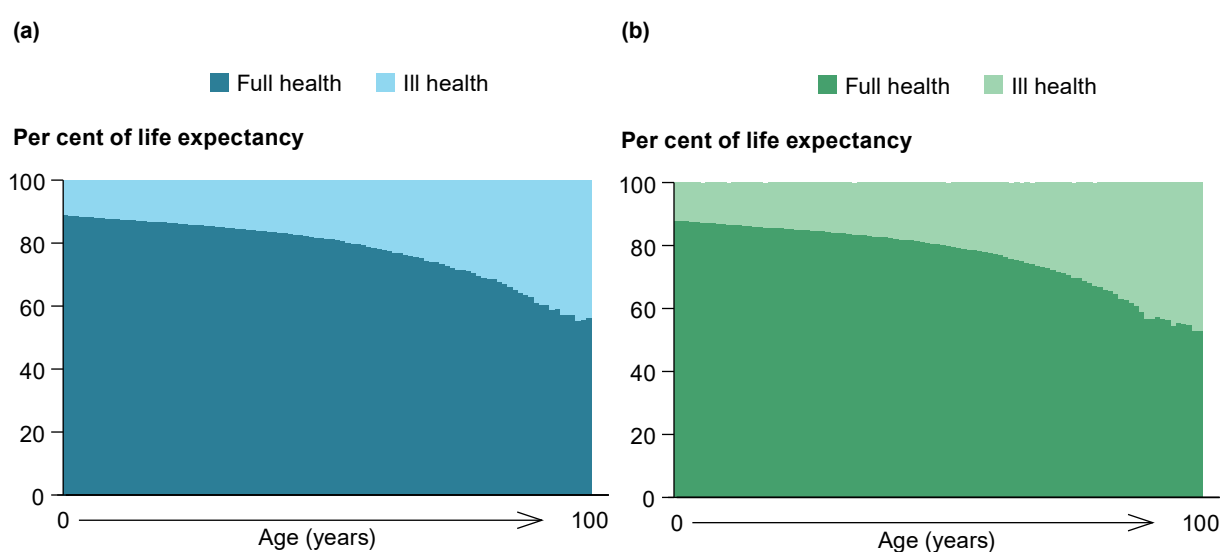
Measuring the health-adjusted life expectancy

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

- In 2015, HALE for males at birth was 71.5 years and 74.4 years for females. This was 2.0 more years in full health for males compared with 2003 and 1.3 more years for females.
- Comparing HALE to life expectancy, on average, males and females at birth spent 89% and 88% of their lives in full health, respectively.
- The proportion of years spent in full health reduced with age (Figure 14). Australians aged 65 could, on average, expect to spend 76% of their remaining life in full health.

Figure 14: Percentage of remaining life expectancy in full health and ill health at each age, males(a) and females(b), 2015



HALE is unequal between socioeconomic groups

- Males and females in the highest socioeconomic group had a longer life expectancy and HALE, both at birth and at age 65 compared with their counterparts the lowest group.
- Between 2011 and 2015, life expectancy increased (or remained the same) for both the highest and lowest socioeconomic groups. However, HALE at birth increased for the highest socioeconomic group (from 74.8 to 75.7 years for males and from 76.7 to 77.6 for females) but decreased for the lowest socioeconomic group (from 68.7 to 68.3 years for males and from 72.7 to 71.8 for females).

Where can I find out more?

More information on the ABDS 2015 can be found on the AIHW website

<http://www.aihw.gov.au/burden-of-disease/>

A full report on the ABDS 2015 is available at

<https://www.aihw.gov.au/reports/burden-of-disease/burden-disease-study-illness-death-2015/>

Detailed information on the methods used in the ABDS 2015 study are available in a detailed methods report <https://www.aihw.gov.au/reports/burden-of-disease/australian-burden-disease-study-methods-2015/>


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 2015*. It provides estimates of the burden due to 216 diseases and injuries in Australia and the contribution of various modifiable risk factors to this burden. A new analysis of the change in burden of disease between 2003 and 2015 is also presented.

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better decisions,
improved health and welfare

