

Burden of disease and injury



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- Burden of disease studies aim to quantify the gap between the ideal of everyone living to old age in good health, and the actual health of a population where there is illness and early death. The analytical method uses the disability adjusted life year (DALY) to estimate the cumulative health loss through disability (YLD) and death (YLL) in a population. The DALY is a single measure of health loss that allows comparability over time and between diverse populations, despite the varied impacts and outcomes of different conditions.
- For Queensland in 2011:
 - The leading cause of disease burden (DALYs) was cancer, followed by cardiovascular disease, musculoskeletal conditions and mental health disorders.
 - The three largest specific causes of premature death (YLL) were coronary heart disease, lung cancer, and suicide and self-inflicted injuries.
 - The three largest specific causes of disability (YLD) were back pain and problems, anxiety disorders and depressive disorders.
- Risk factors explained one-third of the disease burden in Queensland in 2011 with tobacco causing the most health loss, followed by poor diet and high body mass. Risk factors accounted for 43% of deaths in 2016 (about 13,000 in Queensland).
- The Indigenous Queensland disease burden was 2.2 times the non-Indigenous rate. The leading specific causes of health loss for Indigenous Australians (comparable data not available for Queensland) were coronary heart disease, suicide and self-inflicted injuries, anxiety disorders, alcohol use disorders and diabetes. The largest contributor to the health gap for Indigenous Australians was tobacco (23%) followed by poor diet (15%).
- The burden in Australia is changing and between 1990 and 2016:
 - the DALY burden increased by 24%
 - the fatal burden decreased by 12%
 - the disability burden increased by 45%.
- Among 34 high income countries in 2011, Australia was ranked:
 - ninth best for fatal burden
 - third worst for disability burden
 - eighth best for risk factor impacts.

Queensland

In 2011, there were 907,268 years of healthy life lost to death or disability in Queensland.^{24,25} The total disease burden (DALYs) was fairly evenly split between fatal outcomes (51% YLL) and disability burden (49% YLD). Burden due to early death was greater for males (60%) and was 1.5 times the female rate. Disability burden was similar for males and females (50%).

Data for this chapter was derived from the Australian Burden of Disease Study (ABDS)²⁴ with additional data provided to Queensland and included in a summary report.²⁵

Total disease burden (DALYs): Non-communicable or chronic diseases caused 84% of loss of healthy life followed by injury (10%) and communicable, maternal and neonatal conditions (6%) in Queensland in 2011. Health loss from early death was higher for injury (81%), and communicable, maternal and neonatal conditions (67%) than chronic or non-communicable diseases (47%).

The four leading broad causes of total disease burden accounting for more than half the total burden were cancer (18%), cardiovascular disease (15%), musculoskeletal conditions (12%) and mental disorders (11%). The specific causes with the greatest impact on health loss were coronary heart disease (8%), COPD (3.8%) and lung cancer (3.4%).

Premature death burden (YLL): Around 466,400 years were lost due to early death in Queensland in 2011. Three-quarters of fatal burden (76%) was due to chronic conditions, 16% to injuries and 8% to communicable, maternal and neonatal conditions. The largest broad causes were cancer (33%), cardiovascular disease (22%) and injury (16%). The three largest specific causes were coronary heart disease (12%), lung cancer (6%), and suicide and self-inflicted injuries (6%).

Disability burden (YLD): Chronic conditions (92%) caused the majority of the disability burden (YLD) followed by injury (4%) and communicable, maternal and neonatal conditions (4%) in Queensland in 2011. The largest broad causes of disability were musculoskeletal conditions (23%), mental disorders (22%) and respiratory disorders (12%). The three largest specific causes of disability were back pain and problems (7%), anxiety disorders (6%) and depressive disorders (5%). This excludes the residual category of other musculoskeletal disorders (9.0%).

Risk factors: One-third (33%) of the total burden of disease and injury in Queensland was due to the joint effect of 29 risk factors. These risk factors explained 22% of the disability burden and 43% of fatal burden in Queensland (Table 2). The combined effect of the 29 risk factors resulted in 64,992 deaths of Australians in 2011, and about 13,000 were estimated to be Queenslanders.

The 10 leading risks were tobacco smoking (9.1% of DALYs), joint effect of dietary risks (7.8%), high body mass (6.5%), risky alcohol consumption (5.4%), high blood pressure (5.3%), physical inactivity (5.0%), high blood plasma glucose (2.7%), high cholesterol (2.5%), occupational exposures and hazards (2.0%) and illicit drug use (1.4%) (Table 2). The impact of these risks is described in more detail in the relevant sections of Chapter 8, commencing on page 53. For Australia, the impact of risk exposure on disease burden has contracted slightly over the past eight years²⁴, showing benefits from preventive action, with smoking reduction the leading success story.

Table 2: Key burden of disease metrics, by risk factor, Queensland²⁵

Risk factor	2011			2016	
	DALY %	YLL %	YLD %	Estimated deaths	% of deaths
All risk factors (joint effect) ^(a)	33	43	22	12,600	43
Tobacco use	9.1	14	4.5	3,600	12
All dietary risks (joint effect) ^(a)	7.8	12	3.3	3,800	13
High body mass	6.5	8.1	4.9	2,400	8.2
High blood pressure	5.3	8.2	2.2	3,000	10
Physical inactivity	5.0	7.6	2.3	2,200	7.5
Alcohol use	5.4	6.2	4.6	1,300	4.3
High blood glucose	2.7	2.8	2.6	920	3.1
High cholesterol	2.5	3.8	1.0	1,000	3.5
High sun exposure	1.0	1.7	0.2	430	1.4
Illicit drug use	1.4	2.0	0.7	360	1.2
Occupational exposures and hazards	2.0	1.1	2.9	220	0.8

^a Complex pathways and interactions between risk factors mean it is not possible to sum the impact of individual risk factors. The joint effect analysis should be used to examine the impact of all risk factors included in the study, and all dietary risk factors.

Indigenous Queenslanders

Estimates for the Indigenous Australian population were produced as part of the ABDS.²⁶ While state-level data was limited, it did include critical information to assist in policy and planning within Queensland to improve the health of Indigenous Queenslanders. Information from the Australian study was supported by a Queensland specific study undertaken by Queensland Health which provides more local level data.²⁷

After adjustments were made for age differences, the burden rate for Indigenous Queenslanders in 2011 was more than double that of non-Indigenous Queenslanders with higher burden for fatal outcomes than for disability. Chronic diseases caused 64% of total burden for Indigenous Australians, and accounted for 70% of the health gap between Indigenous and non-Indigenous Australians. More than one-third of the burden of disease in Indigenous Australians could have been prevented through modifiable risk factors.

Total disease burden (DALYs): The burden rate for Indigenous Queenslanders in 2011 was 2.2 times the non-Indigenous rate. Mental and substance use disorders was the leading broad cause of total burden (DALYs) for Indigenous Queenslanders (21%), followed by injuries (13%), cardiovascular disease (11%), cancer (10%), musculoskeletal (7%), infant/congenital (7%) and respiratory conditions (7%).

The largest relative difference between non-Indigenous and Indigenous Queenslanders (based on burden rate) for broad cause was for kidney/urinary disorders (6 times the non-Indigenous rate) and endocrine disorders (5.2 times the non-Indigenous rate).

This is indicative of higher incidence of disease, later diagnosis and poorer management of diabetes for Indigenous Queenslanders. Cardiovascular disease and mental and substance use disorders accounted for the greatest absolute difference in rates between non-Indigenous and Indigenous Queenslanders.

Due to small numbers, jurisdictional estimates are not available at the specific cause level. Instead, Australian data are used. The five leading specific causes in 2011 for Indigenous Australians were coronary heart disease (7.2%), suicide and self-inflicted injuries (4.5%), anxiety disorders (4.4%), alcohol use disorders (4.2%) and diabetes (4.1%).

Premature death burden (YLL): The fatal burden rate for Indigenous Queenslanders was 2.4 times the non-Indigenous rate. The leading broad causes of premature death for Indigenous Queenslanders in 2011 were injuries, accounting for 22% of total fatal burden, cardiovascular disease (19%), cancers (18%) and infant/congenital conditions (13%).

23% of the **Indigenous health gap** was due to tobacco smoking—the leading contributor.

Disability burden (YLD): The disability burden rate for Indigenous Queenslanders was 1.9 times the non-Indigenous rate. For Indigenous Queenslanders, the leading broad causes of disability (YLD) in 2011 were mental and substance use disorders (41% of total disability burden), musculoskeletal (14%), respiratory (11%), neurological conditions (5%) and injuries (5%).

Risk factors: The joint effect of 29 modifiable risk factors accounted for 37% of burden for Indigenous Australians (data for Queensland is not available) (Table 3). Tobacco use accounted for 12% of DALYs and was the largest single contributing risk factor followed by dietary factors (10%), alcohol use (8%), high body mass (8%), physical inactivity (6%), high blood pressure (5%) and high blood sugar (5%). The joint effect of these risk factors accounted for 90% of the burden of endocrine disorders, 80% of the cardiovascular disease burden, 54% of cancer burden and 48% of burden due to kidney and urinary diseases, illustrating the potential for improved health outcomes for Indigenous Queenslanders through a continuing focus on prevention.

Risk factors combined, accounted for 51% of the health gap between non-Indigenous and Indigenous Australians, with tobacco a leading individual contributor explaining 23% of the gap (Table 3).²⁶ Strategies to reduce exposure to tobacco are therefore critical to closing the life expectancy gap.

Dietary factors were responsible for 15% of the gap, demonstrating an important opportunity for gain through ongoing investments to improve the nutritional status of Indigenous Queenslanders.

Table 3: Risk factors, Indigenous Australians, 2011²⁶

		% total Indigenous DALY	% of health gap*
1	Tobacco use	12.3	23.3
2	Dietary risk factors (combined)	9.7	15.2
3	Alcohol use	8.3	8.1
4	High body mass	8.2	14.1
5	Physical inactivity	5.5	8.2
6	High blood pressure	4.9	8.1
7	High blood plasma glucose	4.6	8.8
8	Drug use	3.7	4.1
9	High cholesterol	2.6	3.4
10	Childhood sexual abuse	2.1	2.6
Total (29 risk factors)		36.9	51.4

* between Indigenous Australians and non-Indigenous based on DALY rates.

Queensland and Australian rankings

ABDS included limited jurisdictional comparisons. Queensland did not differ from national on the main metrics (DALYs, YLL and YLD) and had the fifth lowest rate among the eight jurisdictions for each.²⁴

Australia and international rankings

Australia was ranked highly for death and DALY metrics based on the 2016 global burden of disease study that compared 195 countries for 328 disease and injury causes.²⁸

In 2016, Australia had the 10th lowest rate of total health loss having improved from 13th place in 1990. Singapore had the lowest rate of burden. After accounting for changes in age distribution, Australia's burden rate decreased by 25% between 1990 and 2016. The total burden, however, increased by 24%.

Fatal burden: Australia ranked in the top 10 among 34 high income countries for five of the 10 leading causes of fatal burden. Australia was ninth best of 34 countries for fatal burden, considering a composite ranking score.²⁵ Australia's fatal burden decreased by 12% between 1990 and 2016 with a 43% decrease in the burden rate.

Disability burden: Although life expectancy is improving we are spending more time with disability. Australia was ranked inside the top 10 among 34 high income countries for only two of the 10 leading causes of disability. Australia was third worst (31st best) out of 34 countries for disability burden, considering a composite ranking score.²⁵

In 1990, 45% of Australia's burden was due to disabling outcomes, by 2016 this had increased to 55%. There is a disability transition in Australia where the majority of burden is now from disabling rather than fatal outcomes. Expanding morbidity along with an ageing population will put pressure on the health system in future. More needs to be done to address the disability burden in Australia.

Australia's disability burden increased by 45% between 1990 and 2016 with a 2% decrease in the disability burden rate.

Risk factors: In 2016, Australia was ranked inside the top 10 among 34 high income countries for five of the 10 leading risk factors. Considering a composite ranking score, overall Australia was eighth best out of 34 countries, with Japan the best, followed by Spain, France, Switzerland, Israel, Netherlands and Andorra.²⁵

Fatal outcomes

Australia
9th best
of 34 high income
countries

Disability burden

Australia
3rd worst
of 34 high income
countries

Risk factor exposure

Australia
8th best
of 34 high income
countries

Data sources and methods: burden of disease

The most recent complete burden of disease and injury study for Australia was released in 2016—the ABDS (2011 data).²⁴ It was conducted by the Australian Institute of Health and Welfare (AIHW) and adopted the methodologies of the Global Burden of Disease (GBD) study using the most recent detailed prevalence estimates specific to Australia. An update on the 2011 study is now underway.

The GBD study with the first series of reports released in 2010 represented a leap forward in methodologies. GBD now provides annual estimates with data available from the website.²⁸

A summary burden of disease report for Queensland was released in 2017. The report and data visualisations are available from the Queensland Health website. Queensland Health has also published a Queensland specific study on the burden of disease in Queensland's Aboriginal and Torres Strait Islander people.²⁷ This study uses methods more closely aligned to the Australian burden of disease and injury 2003²⁹ and thus is not comparable to the ABDS or GBD.