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Australian Institute of
Health and Welfare



First Nations Burden of Disease Study 2022



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Summary

Burden of disease measures the impact of diseases and injuries on a population. It combines the years of healthy life lost due to living with ill health (non-fatal burden) with the years of life lost due to dying prematurely (fatal burden). A significant proportion of this burden is preventable, being due to modifiable risk factors. The First Nations Burden of Disease Study (FNBDS) 2022 includes estimates of disease burden due to 220 diseases and injuries in Australia in 2022.

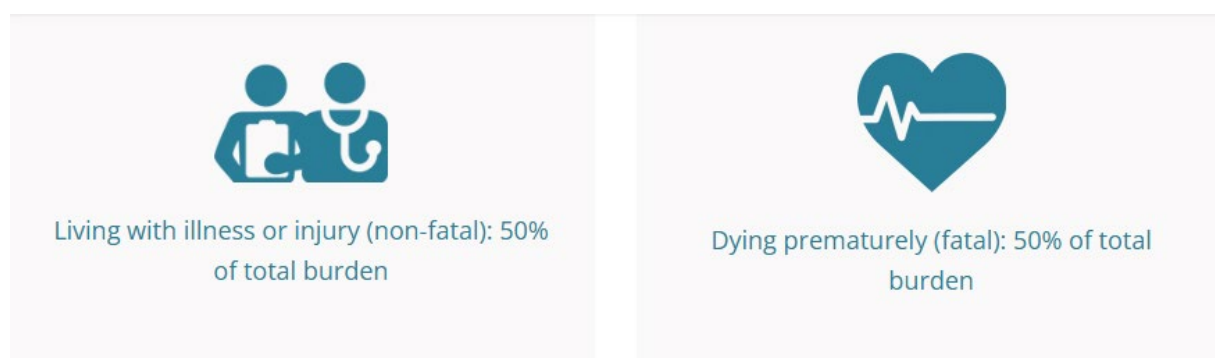
This report presents a summary of the main findings from the FNBDS 2022, with estimates for previous years (2011, 2018) for comparison. Estimates from the FNBDS 2022 supersede those produced for the Aboriginal and Torres Strait Islander component of ABDS 2018. Content covering the gap in burden of disease between First Nations people and non-Indigenous Australians, geographic differences in burden, health-adjusted life expectancy and the burden attributable to risk factors will be added gradually during 2026.

The latest results for the whole Australian population are presented in [Australian Burden of Disease Study 2024](#).

To explore burden of disease estimates in more detail see the [Interactive data on disease burden](#). See [technical notes](#) for methodological changes for FNBDS 2022 and the [Australian Burden of Disease Study: methods and supplementary material 2018](#) for more detailed information.

Living with illness or injury and dying prematurely contribute equally to the burden of disease

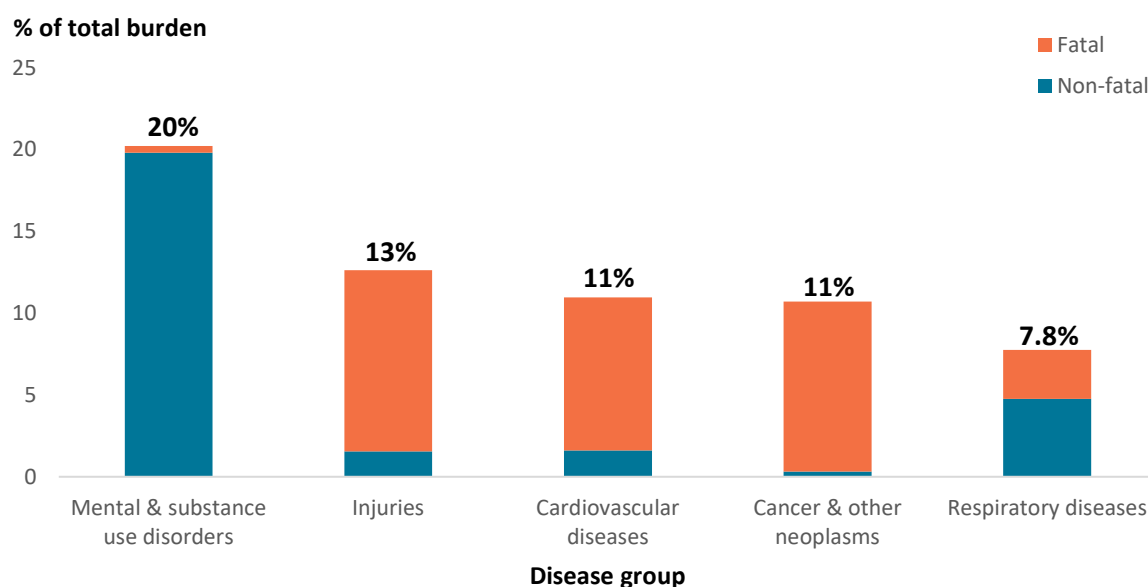
In 2022, First Nations people lost 317,083 years of healthy life (total burden, DALY), with 158,693 years lost to non-fatal burden (YLD) and 158,389 years lost to fatal burden (YLL).



Chronic diseases and injuries cause most of the burden

Out of the 17 disease groups, the disease groups that caused most of the total burden in 2022 were mental health conditions & substance use disorders, injuries, cardiovascular diseases, cancer & other neoplasms and respiratory diseases; together, these accounted for 62% of the total burden among First Nations people (Figure 1).

Figure 1: Proportion (%) of total burden, and fatal and non-fatal composition of total burden, by top 5 disease groups, First Nations people, 2022

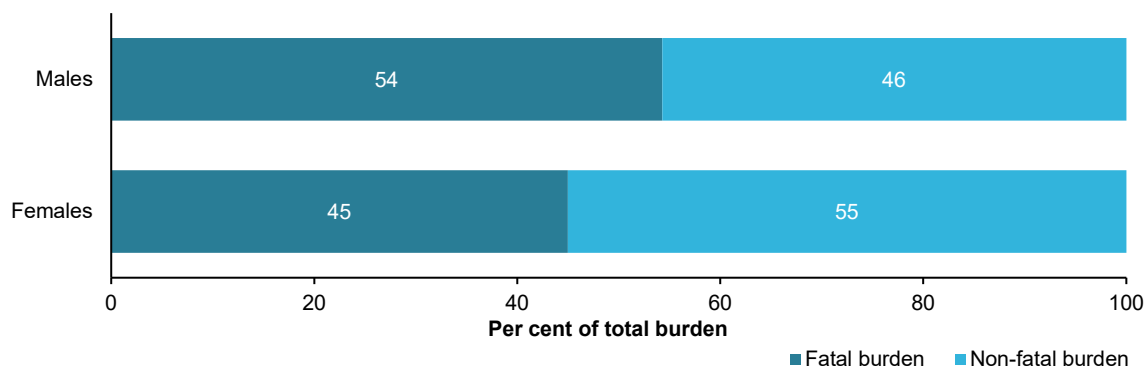


Source: AIHW First Nations Burden of Disease Database

Higher burden for males, particularly fatal burden

In 2022, dying from disease and injury accounted for more of the burden in males (54%), while living with illness accounted for more of the burden in females (55%) (Figure 2).

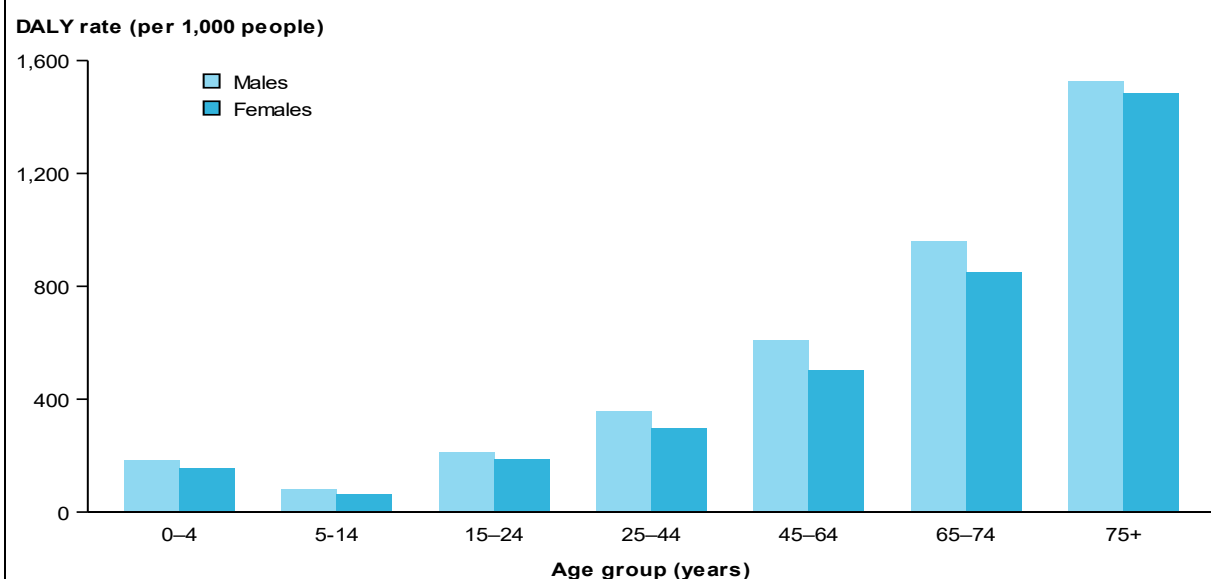
Figure 2: Proportion (%) of total burden due to fatal and non-fatal burden by sex, 2022



Source: AIHW First Nations Burden of Disease Database

First Nations males experienced a greater rate of total burden than First Nations females, particularly in people aged 45–64 and 65–74 (Figure 3).

Figure 3: Rate of total burden (DALY per 1,000 people), by sex and age group, First Nations people, 2022



Source: AIHW First Nations Burden of Disease Database

Top specific causes of the burden

The top 5 specific causes of burden for First Nations people in 2022 were:

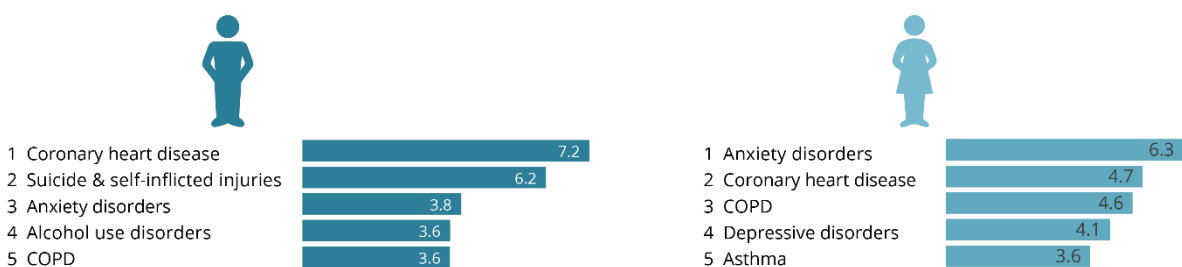
- Coronary heart disease (6.0%)
- Anxiety disorders (5.0%)
- Suicide & self-inflicted injuries (4.5%)
- Chronic obstructive pulmonary disease (COPD) (4.0%)
- Depressive disorders (3.4%)

These 5 causes together accounted for 23% of the total burden.

Coronary heart disease, anxiety disorders and COPD were ranked in the top 5 diseases for both sexes; however, the proportion of burden that each contributed was different (Figure 4).

Figure 4: Leading causes of total burden and proportion (%) of total burden by sex, 2022

Leading 5 diseases by sex

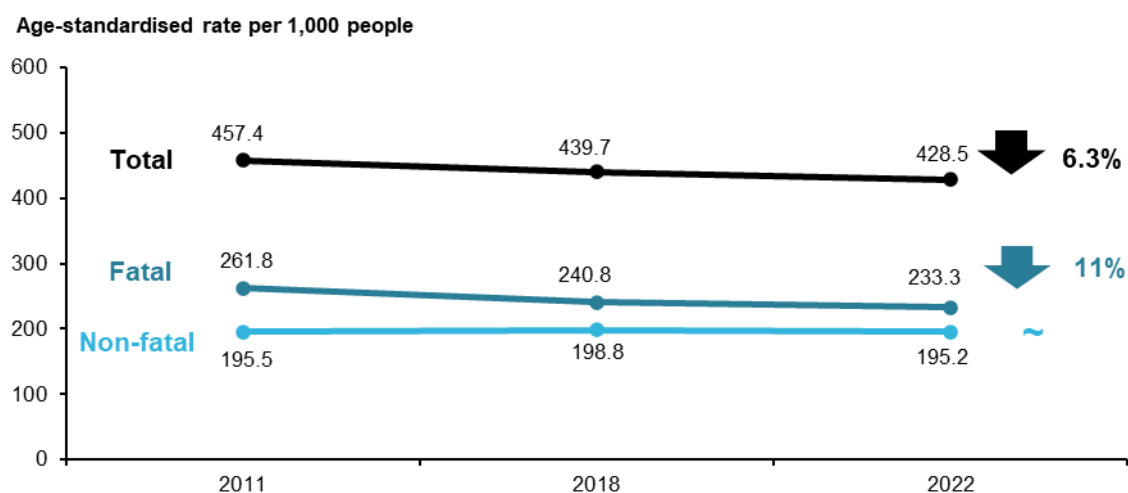


Source: AIHW First Nations Burden of Disease Database

Decline in premature deaths, but levels of illness and injury remain stable

Overall, the health of First Nations people has improved over the period from 2011 to 2022. After adjusting for population growth and ageing, there was a 6.3% decline in total burden – this decrease was driven by an 11% decline in fatal burden (Figure 5). Over the same period there was no substantial change in non-fatal burden.

Figure 5: Changes between 2011 and 2022 in rates of total burden (DALY), fatal burden (YLL) and non-fatal burden



Source: AIHW First Nations Burden of Disease Database

Burden of disease in First Nations people

For Aboriginal and Torres Strait Islander (First Nations) people, good health is more than the absence of disease or illness; it is a holistic concept that includes physical, social, emotional, cultural, spiritual and ecological wellbeing, for both the individual and the community. Although the health of First Nations people has improved in a number of areas over the past decade (for example, cardiovascular disease deaths), there are still areas where outcomes have not improved, or have worsened (such as potentially preventable hospitalisations, cancer and suicide rates) (AIHW 2025).

This report presents results from the First Nations Burden of Disease Study (FNBDS) 2022. The FNBDS 2022 is based on the Australian Institute of Health and Welfare's [previous burden of disease studies](#) and provides an update of estimates for the First Nations population. The current reference year for the FNBDS is 2022 as this was the latest year of data available at the time of analysis for the majority of data sources used to produce burden of disease estimates for First Nations people. Estimates from the FNBDS 2022 supersede those produced for the Aboriginal and Torres Strait Islander component of the Australian Burden of Disease Study (ABDS) 2018. Content covering the gap in burden of disease between First Nations people and non-Indigenous Australians, geographic differences in burden, health-adjusted life expectancy and the burden attributable to risk factors will be added gradually during 2026.

A separate report presents the latest results for the whole Australian population – [Australian Burden of Disease Study 2024](#).

High-quality information on the health impacts and distribution of different diseases, injuries and risk factors is important in providing an evidence base to inform both health policy and programs and service delivery. This is especially important for the Aboriginal and Torres Strait Islander population because it is known to have unacceptably high levels of mortality, illness and injury (AIHW 2025).

Burden of disease analysis measures the impact of fatal and non-fatal burden; that is, both deaths and living with poor health. More than counting deaths or disease prevalence, it also takes into account age at death and severity of disease, and allows different diseases to be compared and reported in a consistent manner. Estimates produced from a burden of disease study are the best summary measures of a population's health.

Burden of disease analysis also allows the contribution of modifiable risk factors to be estimated. Many factors outside health have a significant impact on the health and wellbeing of the First Nations population – for example, justice issues, racism (both individual and systemic), ongoing poverty and disadvantage, and experiences of multiple and long-term stressors. Past colonisation and the colonial present have had, and continue to have, a devastating impact on First Nations communities and cultures. Violence and epidemic disease associated with past colonisation caused an immediate loss of life, while the occupation of land by settlers, restriction of First Nations people to reserves, controlled employment and the forced removal of children under Aboriginal

protection policies disrupted families, communities, culture and the ability of First Nations people to support themselves. Many First Nations people suffer inter-generational trauma resulting from these past events. Although many of these factors are not able to be explicitly measured in this analysis, their impact on health is evident in the high levels of burden experienced by First Nations people.

What is burden of disease?

Burden of disease analysis measures the impact of disease and injury in a population (in this report, the First Nations population of Australia) by estimating the amount of 'disability-adjusted life years' (DALY) experienced by that population. This measure counts the combined years of healthy life lost due to living with and dying prematurely from disease and injury. It is the difference between a population's actual health and its ideal health, where ideal health is living to old age in good health (without disease or disability).

If a disease has a high number of DALY, it has a high burden on the population. Some diseases have high fatal burden (YLL) due to the number of premature deaths they cause (for example, cancers) or because they cause death at younger ages, while others have high non-fatal burden (YLD) due to the number of people living with the condition and/or the severity of the illness (for example, musculoskeletal conditions).

Burden of disease summary measures

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

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

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

Each of these 3 measures can be expressed as the number of YLD/YLL/DALY in a population, or as a crude or age-standardised rate. See also [Different types of statistics presented in this report](#).

Burden estimates can be reported for individual diseases or injuries, referred to as 'causes', most of which describe a specific health problem (for example, dementia). Reporting can also be for a disease group (for example, neurological conditions), which consists of a number of related causes. For more information on each disease group see [Australian Burden of Disease Study: Methods and supplementary material 2018, Disease specific methods - morbidity](#). 'Residual' causes (for example, other infections) have been excluded from rankings in this report, as these are often made up of several diverse

conditions which, as a group, are difficult to interpret. There are 220 separate causes and 17 disease groups in the FNBDS.

Example of calculating disability-adjusted life years

Burden of disease analyses estimate health loss from living with or dying from disease and injury in a single year – measured as DALY.

Joe, aged 65, has angina (a chronic heart condition that causes temporary chest pain on exertion). Joe suffers health loss from living with angina; in burden of disease analyses, this impact is measured using a 'disability weight' that reflects the severity of the disease and its effects on a person's life – see the [ABDS methods report](#) for more detail. Angina has a disability weight of 0.2 and, as it is a chronic condition, it would affect Joe for the entirety of that year ($0.2 \times 1 \text{ year} = 0.2 \text{ YLD}$). This gives Joe a total of 0.2 YLD health loss due to coronary heart disease (the burden of disease cause that includes angina).

Sam, aged 18, has appendicitis (requiring appendectomy); they would experience short-term health loss (for about 2 weeks) with a disability weight of 0.3 ($0.3 \times 2/52 = 0.01 \text{ YLD}$). This gives Sam a total of 0.01 YLD health loss due to appendicitis.

Pat, aged 58, dies of liver cancer, and will lose a number of years by dying early. A person aged 58 would (according to the reference life table) live until 91. If Pat dies at 58, they will have lost 33 years (or 33 YLL) due to liver cancer.

Together, Joe, Sam and Pat contribute 33.21 DALY (0.21 YLD plus 33 YLL).

About the data in this report

The results presented here for each reference year (2011, 2018 and 2022) are modelled estimates of the time people spent in less than full health because they died from, or were living with the effects of, illness or injury in that year. The data used to produce these estimates are drawn from a range of Australian sources such as hospital records, disease registers, health surveys, academic studies, and death records. While some of these sources focus on First Nations people exclusively (for example, the [National Aboriginal and Torres Strait Islander Health Survey, 2022–23](#)), most data sources include both First Nations people and non-Indigenous Australians, and generally contain information on the sex, age and broad location of cases, as well as their Indigenous status.

It is known from previous investigations that Indigenous status information in many data sources is incomplete, meaning that fewer cases are identified as First Nations people than actually occurred. There are many reasons for this, such as:

- the person (or their representative) may not have been asked about their Indigenous status
- the person may have been asked, but chosen not to identify
- a data recording error.

Responding to the question about Indigenous status is voluntary. A person's choice to identify as an Aboriginal and/or Torres Strait Islander person may be affected by the context in which the question is asked – for example, whether other people are present, whether other information is also being collected, what the circumstances are, and how safe they feel at that time or in that place to share that information.

The National Agreement on Closing the Gap defines a culturally safe environment as one where there is no assault, challenge or denial of the person's identity, who they are and what they need (All Australian governments & Coalition of Aboriginal and Torres Strait Islander Peak Organisations 2020). It is a place where cultural values, strengths and differences are respected, and racism and inequity are addressed (AIHW 2023). Individuals may choose to identify as Aboriginal and/or Torres Strait Islander people in some circumstances but not others, and this may change over time depending on their experiences as well as the impact of wider societal events and changes, such as the 2023 'Voice' referendum or the 2025 Victorian Statewide Treaty Bill.

For this analysis, data from sources where there was evidence to quantify the extent of under-identification were adjusted to better estimate the burden of disease in First Nations people. More detailed information is provided in the [Technical notes](#).

Where no data were available to provide a reliable First Nations prevalence estimate, indirect methods were used to derive prevalence estimates. Such methods included applying rate ratios, such as First Nations-to-non-Indigenous ratios, from proxy data sources (for example, hospitalisations) to the total population prevalence. Indirect methods were used to derive First Nations prevalence for either the whole or part of the disease for 82 diseases across 12 disease groups. For more information on these diseases see: [Australian Burden of Disease Study: Methods and supplementary material 2018, Years lived with disability \(YLD\)](#)

Different types of statistics presented in this report

A range of different statistics and estimates are presented in this report, which are useful for different purposes. These include:

Numbers of DALY, YLD and YLL describe the overall (DALY), non-fatal (YLD) and fatal (YLL) disease burden in the population being analysed. They are useful for summarising the health of that population at a point in time, for assessing health-care needs and planning health services.

Crude rates of DALY, YLL and YLD provide a measure of health loss against the size of the population, but without taking any other features of the population into account. They are useful for measuring the relative impact in one age group compared with another by describing the amount of health loss relative to the size of the age group. They are also useful for assessing health-care needs and planning health services.

Age-standardised rates of DALY, YLL and YLD also provide a measure of the health loss against the size of the population, but take into account the age structure of the population and changes in population size and ageing over time. Age-standardised rates have little use in service provision planning, but are useful for comparing the impact of various diseases between 2 populations with different age structures (for example, First Nations people and non-Indigenous Australians) or between 2 different time points (for example, 2011 and 2022).

Two types of percentages are also used in this report:

- **Percent of burden** – this is a measure of the burden in a particular sex, age group, disease group or cause as a proportion of the total. For example, if the total burden was 2,000 DALY, and the burden due to diabetes was 200 DALY, then diabetes contributes 10% of the total burden (calculated as $200/2,000 \times 100$).
- **Percent change over time** – this is a measure of how much the burden has changed between one year and another, relative to the burden in the earlier year. For example, if the total burden was 2,000 in 2011 and 2,500 in 2022, then the burden has changed by 25% (calculated as $(2,500 - 2,000)/2,000 \times 100$).

References

All Australian governments & Coalition of Aboriginal and Torres Strait Islander Peak Organisations (2020), [National Agreement on Closing the Gap | Closing the Gap](#), Department of the Prime Minister and Cabinet. Accessed 13 November 2025.

AIHW (Australian Institute of Health and Welfare) (2023) [Cultural safety in health care for Indigenous Australians: monitoring framework](#), AIHW: Australian Government, accessed 13 November 2025.

AIHW (2025). [Aboriginal and Torres Strait Islander Health Performance Framework: summary report June 2025](#), AIHW: Australian Government, accessed 15 October 2025.

Total burden (DALY)

Key messages

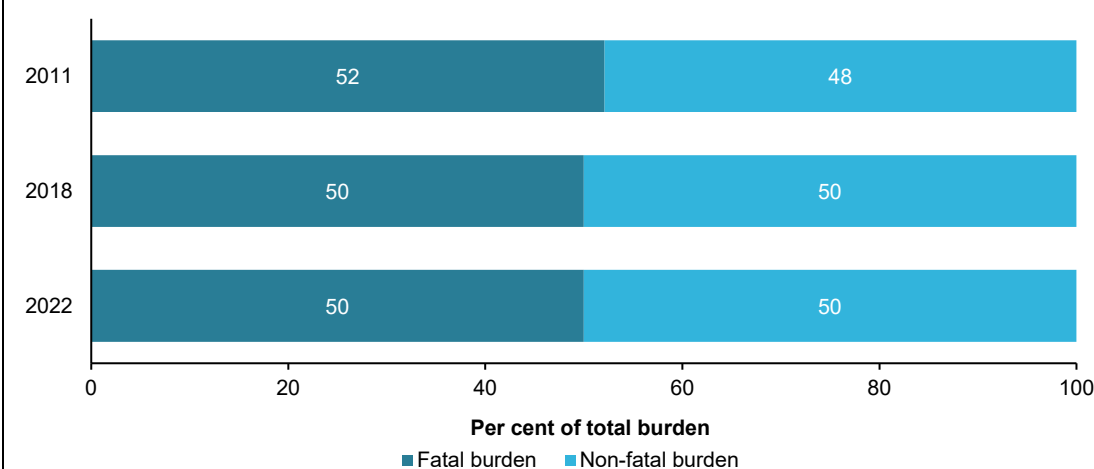
- In 2022, First Nations people lost 317,083 years of healthy life (total burden, DALY) due to premature death or living with disease or injury, or 311 DALY per 1,000 people.
- Living with illness or injury (50% of total burden, 158,693 YLD) and dying prematurely (50% of total burden, 158,389 YLL) contributed equally to the burden of disease.
- In 2022, the main disease groups contributing to total burden for First Nations people were mental health conditions & substance use disorders (20% of total burden), injuries (13%), cardiovascular diseases (11%), cancer & other neoplasms (11%) and respiratory diseases (7.8%).
- The burden from mental health conditions & substance use disorders and respiratory diseases was predominantly non-fatal. The burden from cancer & other neoplasms, injuries and cardiovascular diseases was predominantly fatal.
- At the individual disease level, the leading causes of total burden in 2022 were coronary heart disease (6.0% of total burden), anxiety disorders (5.0%) and suicide & self-inflicted injuries (4.5%).
- Among First Nations people in 2022, COVID-19 was the 14th leading cause of total burden (contributing 2.0% of DALY). COVID-19 was the largest overall contributor to the infectious diseases group, accounting for 47% of its total burden.
- Dying from disease and injury accounted for more of the burden in males (54%), while living with illness accounted for more of the burden in females (55%).
- For infants and children aged under 5, nearly three-quarters (70%) of the burden was due to premature death (fatal burden). Among children aged 5–14, most of the burden (84%) was due to living with illness (non-fatal burden). For people aged 15–44, around two-thirds (64%) of burden was due to non-fatal burden. For people aged 45 and over, almost two-thirds (62%) of the total burden was due to fatal burden.

In 2022, First Nations people lost 317,083 years of healthy life (total burden, DALY) due to premature death or living with disease or injury, or 311 DALY per 1,000 people. There was an equal contribution to the total burden from:

- living with illness or injury (50% of total burden, 158,693 YLD)
- dying prematurely (50% of total burden, 158,389 YLL).

Between 2011 and 2018, there was a decrease in the contribution of fatal burden to total burden. As a result, there was an even contribution of fatal and non-fatal burden to total burden in 2018 and 2022 (Figure 1).

Figure 1: Proportion (%) of total burden due to fatal and non-fatal burden among First Nations people in 2011, 2018 and 2022



Source: AIHW First Nations Burden of Disease Database

To further explore the total burden and the contribution of fatal and non-fatal burden over time, see the following interactive data visualisations:

- [Dashboard 1: Burden of disease in Australia](#): This visualisation provides total, fatal and non-fatal burden numbers and rates both overall and for each disease group by sex and age
- [Dashboard 2: Fatal vs. non-fatal burden](#): This visualisation shows the distribution of fatal and non-fatal burden by year, sex, age group and disease group.

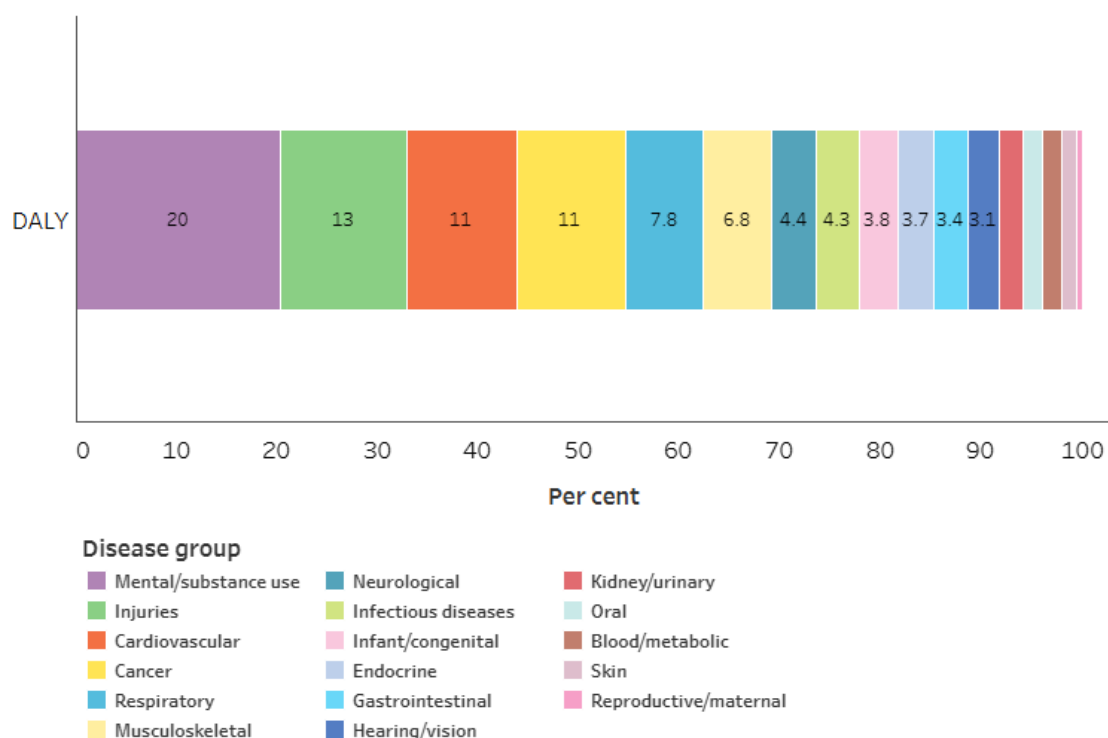
Chronic diseases and injuries dominate

In 2022, the main disease groups contributing to total burden for First Nations people were:

- mental health conditions & substance use disorders
- injuries
- cardiovascular diseases
- cancer & other neoplasms
- respiratory diseases.

Together, these 5 disease groups accounted for almost two-thirds (62%) of the total burden in First Nations people (Figure 2).

Figure 2: Proportion (%) of total burden (DALY) by disease group, First Nations people, 2022



<http://www.aihw.gov.au/>

Source: AIHW First Nations Burden of Disease Database

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

The contribution of fatal burden and non-fatal burden to total burden differed greatly for each disease group (Figure 3).

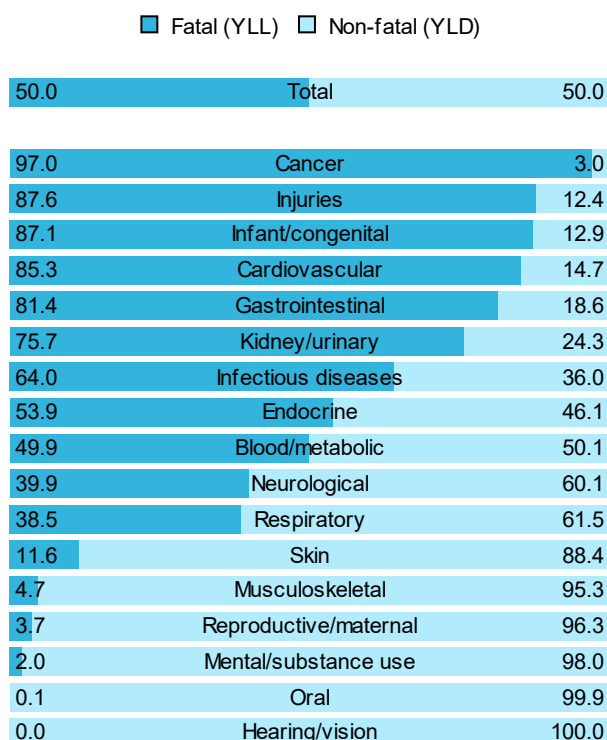
Among the 5 highest burden disease groups:

- the burden from mental health conditions & substance use disorders and respiratory diseases was predominantly non-fatal.
- the burden from cancer & other neoplasms, injuries and cardiovascular diseases was predominantly fatal.

For other disease groups:

- the burden from infant & congenital conditions, gastrointestinal disorders, kidney & urinary diseases and infectious diseases was mostly fatal.
- the burden from neurological conditions, skin disorders, musculoskeletal conditions, reproductive & maternal conditions, and oral disorders was mostly non-fatal, and the burden from hearing & vision disorders exclusively non-fatal.
- the burden from blood & metabolic disorders and endocrine disorders (including diabetes) was made up of similar proportions of fatal and non-fatal burden.

Figure 3: Fatal (YLL) and non-fatal (YLD) burden as a proportion (%) of total burden (DALY), by disease group, First Nations people, 2022



Note: For the oral disease group, the YLL proportion is based on a small number of First Nations deaths so this result should be used with caution.

Source: AIHW First Nations Burden of Disease Database

To explore the contribution of fatal and non-fatal burden by sex, age and year for each disease group, see the interactive data visualisation: [Dashboard 2: Fatal vs. non-fatal burden](#).

Top specific diseases contributing to burden

At the individual disease level, the leading 5 causes of total burden in 2022 were:

- coronary heart disease (6.0% of total burden)
- anxiety disorders (5.0%)
- suicide & self-inflicted injuries (4.5%)
- chronic obstructive pulmonary disease (COPD) (4.0%)
- depressive disorders (3.4%).

Together, these 5 causes accounted for nearly one quarter (23%) of the total burden in First Nations people (Figure 2).

To explore the leading causes of disease and injury in 2022 further, see the interactive data visualisation: [Dashboard 5: Disease/injury-specific summary](#). This visualisation provides numbers, crude and age-standardised rates of total, fatal and non-fatal burden

for the top 50 causes of total burden in 2022, along with charts showing the age and sex distribution for total burden. The information for each cause can be downloaded as a 1-page PDF.

COVID-19 burden in 2022

COVID-19 was not included in the 2018 or 2011 Australian Burden of Disease Studies, having emerged as a new disease in late 2019 and declared a pandemic in March 2020. It has been added to the FNBDS 2022 as a new cause in the infectious diseases group, and estimates of burden are provided for 2022 only.

Among First Nations people in 2022, COVID-19 was the:

- 14th leading cause of total burden (contributing 2.0% of DALY)
- 10th leading cause of fatal burden (contributing 2.7% of YLL)
- 23rd leading cause of non-fatal burden (contributing 1.3% of YLD).

COVID-19 was the largest overall contributor to the infectious diseases group, accounting for 47% of total burden, 49% of fatal burden and 42% of non-fatal burden in the disease group.

For COVID-19:

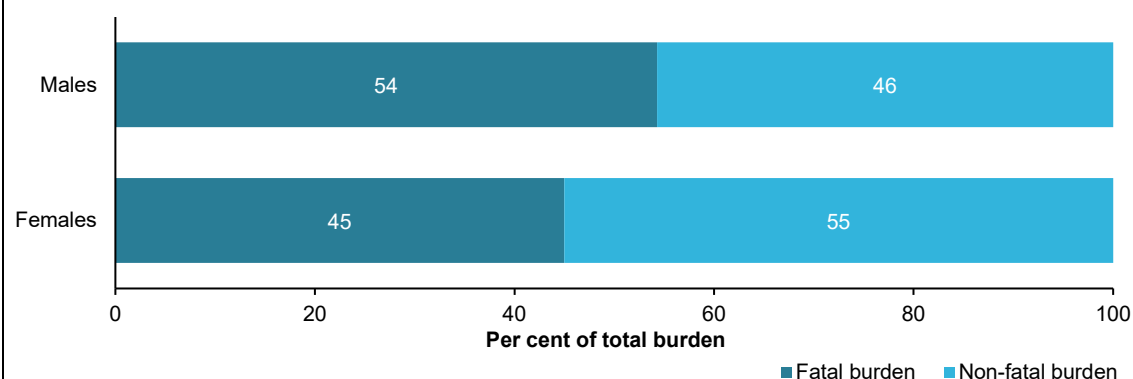
- females experienced more of the total burden than males (53% and 47%, respectively).
- almost one-third (31%) of the total burden was in those aged 45–64.
- the burden was predominantly fatal (68%).
- it was the 5th leading cause of fatal burden among First Nations people aged 75 and over (6.0%).

For information on how disease burden due to COVID-19 was estimated, refer to the [Technical notes](#).

How does total burden differ between males and females?

First Nations males experienced more of the total disease burden (53% of total burden) than First Nations females (47%) in 2022. Dying from disease and injury accounted for more of the burden in males, while living with illness accounted for more of the burden in females (Figure 4).

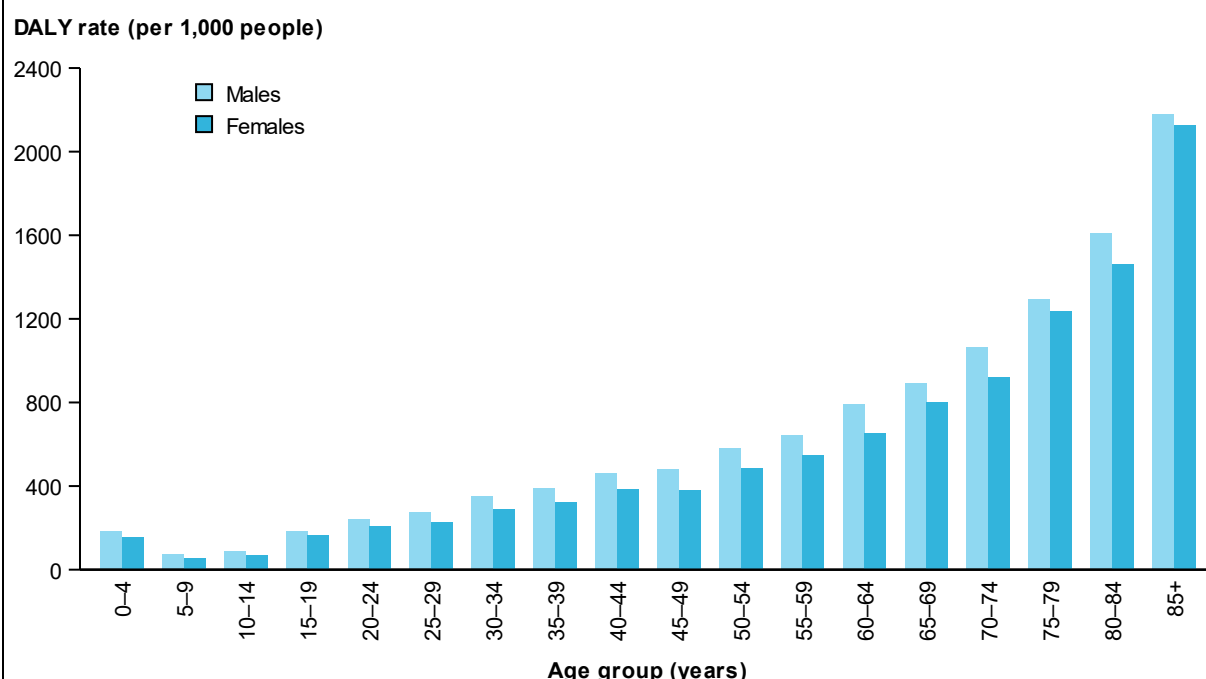
Figure 4: Proportion (%) of total burden due to fatal and non-fatal burden by sex, First Nations people, 2022



Source: AIHW First Nations Burden of Disease Database

Males experienced a greater rate of total burden than females across all age groups, in particular for those age groups 45 and older (Figure 5).

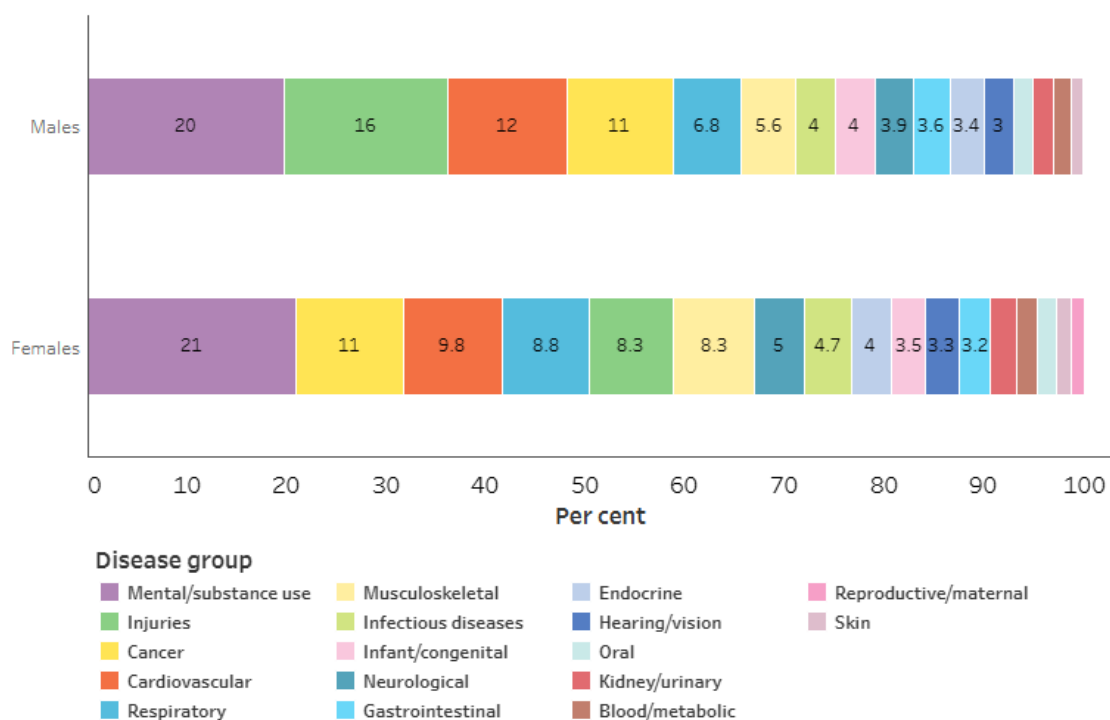
Figure 5: Rate of total burden (DALY per 1,000 people), by sex and age group, First Nations people, 2022



Source: AIHW First Nations Burden of Disease Database

Mental health conditions & substance use disorders was the greatest contributor to total burden for both males and females, accounting for about one-fifth of the total burden in both sexes. Injuries were responsible for a higher proportion of the total burden in males (16%) than in females (8.3%) (Figure 6).

Figure 6: Proportion (%) of total burden (DALY) by disease group and sex, First Nations people, 2022



<http://www.aihw.gov.au/>

Source: AIHW First Nations Burden of Disease Database

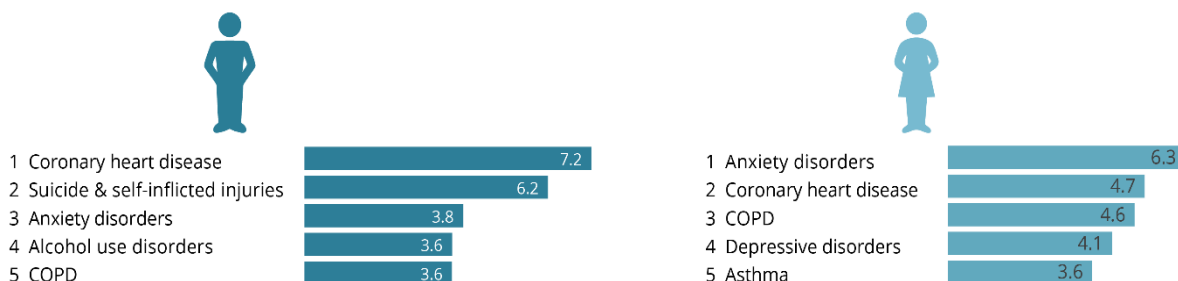
To further explore total, non-fatal and fatal burden by sex and disease group, see the interactive data visualisations: [Dashboard 1: Burden of disease in Australia](#) and [Dashboard 2: Fatal vs. non-fatal burden](#).

Top specific causes contributing to total burden by sex

In 2022, the leading specific causes of total burden among First Nations males were coronary heart disease, suicide & self-inflicted injuries, and anxiety disorders. Among First Nations females, the leading specific causes were anxiety disorders, coronary heart disease, and COPD (Figure 7).

Figure 7: Leading causes of total burden and proportion (%) of total burden by sex, First Nations people, 2022

Leading 5 diseases by sex



Source: AIHW First Nations Burden of Disease Database

First Nations males experienced higher rates of total burden due to suicide & self-inflicted injuries (2.9 times), poisoning (such as the toxic effects of medicinal or other substances) (2.1 times), drug use disorders (1.9 times), coronary heart disease and alcohol use disorders (each 1.7 times) compared with First Nations females. First Nations females experienced higher rates of total burden from osteoarthritis (1.8 times), anxiety disorders (1.5 times), asthma (1.4 times), rheumatoid arthritis and depressive disorders (each 1.3 times) compared with First Nations males.

To further explore the leading specific causes of total burden, see the interactive data visualisation: [Dashboard 4: Leading causes of disease burden](#). This visualisation shows the top 20 contributors to total, fatal and non-fatal burden based on age-standardised rates in 2011, 2018 and 2022 for males, females and persons, and how this has changed over time.

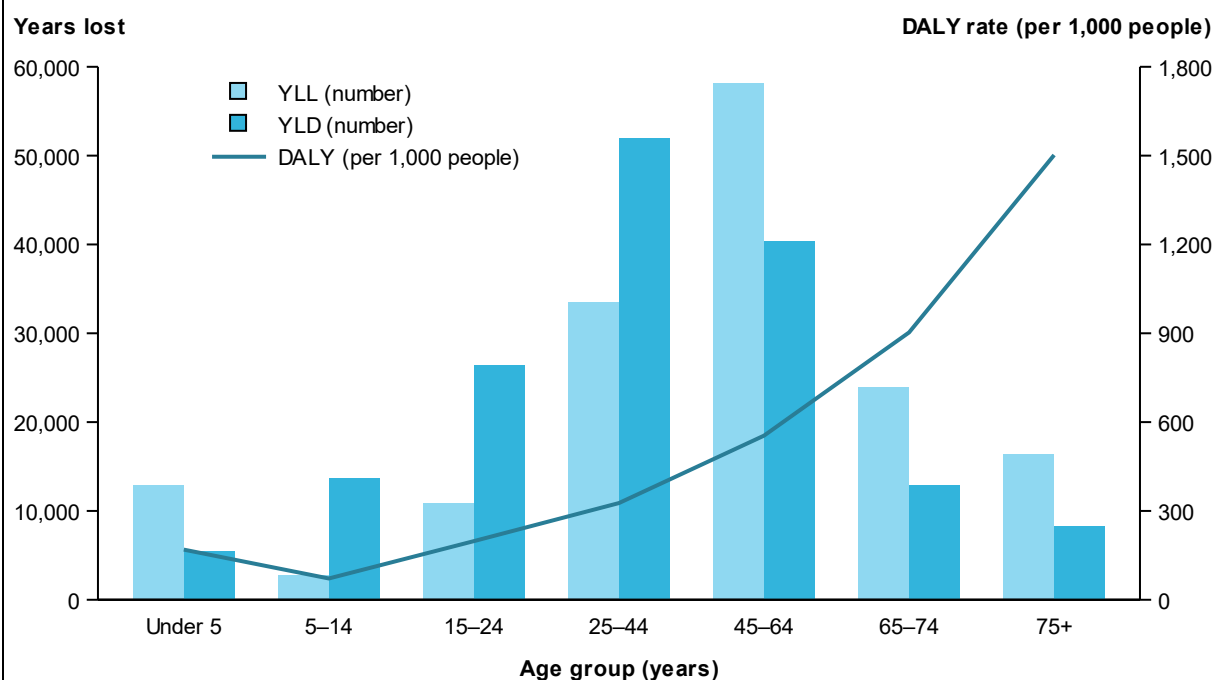
Differences in burden by age

Burden affects First Nations people differently at various stages of life. This is partly due to the different diseases that have an impact at different ages, and partly due to the different causes of death and patterns of age at death for First Nations people.

In 2022, the rate of burden (number of DALY per 1,000 people) increased with age from early childhood. The rate of burden was higher in the under 5 age group than among older children due to the relatively large fatal burden resulting from deaths in infancy.

For infants and children aged under 5, nearly three-quarters (70%) of the burden was due to premature death (fatal burden). Among children aged 5–14, most of the burden (84%) was due to living with illness (non-fatal burden). For people aged 15–44, around two-thirds (64%) of burden was due to non-fatal burden. For people aged 45 and over, almost two-thirds (62%) of the total burden was due to fatal burden (Figure 8).

Figure 8: Fatal (YLL) and non-fatal (YLD) composition of the total burden (DALY) for First Nations people, by age group, 2022



Source: AIHW First Nations Burden of Disease Database

Differences in disease group burden by age

First Nations people experience health loss from different diseases and injuries at various stages of life (Figure 9).

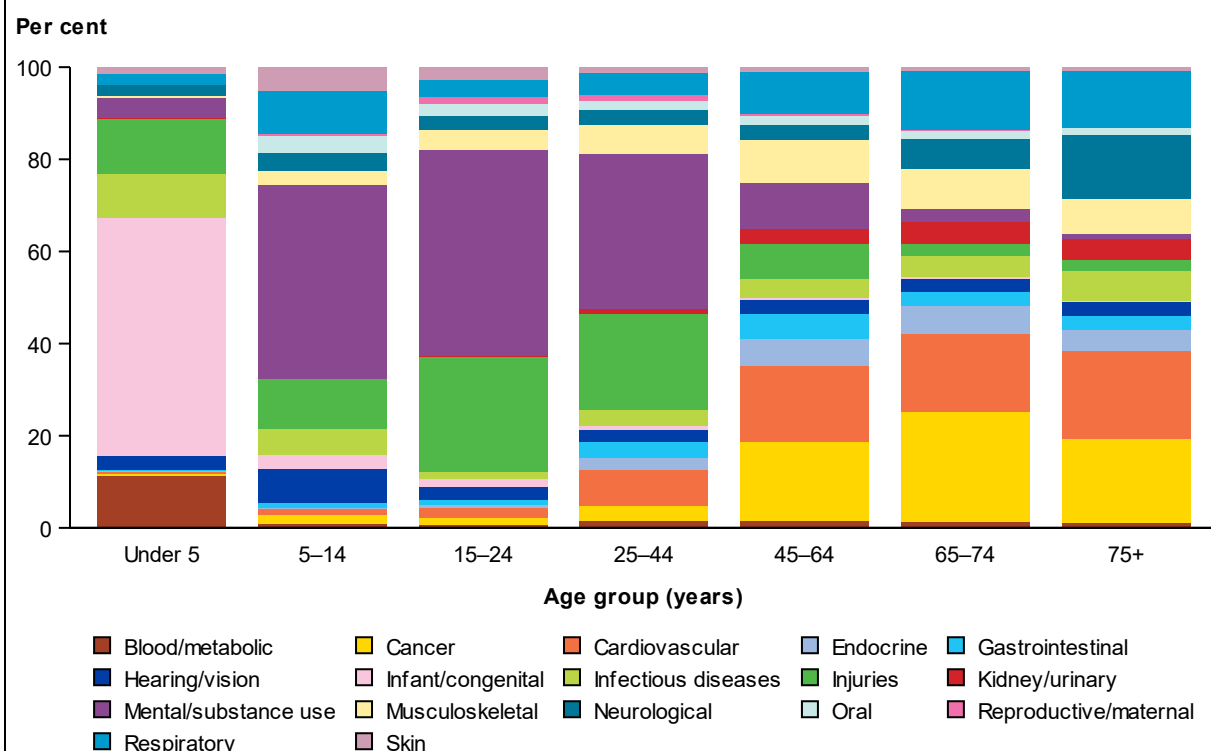
In infancy and young childhood (aged under 5), infant & congenital conditions, such as pre-term birth & low birthweight complications, birth trauma & asphyxia and SIDS, were responsible for just over half (52%) of the burden. Injuries accounted for a further 12% of the total burden in this age group.

Mental health conditions & substance use disorders and injuries (including suicide) were the main causes of burden for late childhood, adolescence and adulthood from ages 5 to 44.

Cardiovascular diseases and cancers started to emerge as major causes of burden from around age 45, and continued to contribute substantially to disease burden in older First Nations people.

Respiratory diseases affected all age groups, accounting for between 2.5% and 13% of total burden across age groups. Musculoskeletal conditions affected all age groups from age 5, accounting for between 3.1% and 9.1% of total burden in First Nations people across age groups.

Figure 9: Relative proportion of total burden (DALY), by disease group and age group, First Nations people, 2022



To further explore the contribution of disease burden by age, see the interactive data visualisations: [Dashboard 1: Burden of disease in Australia](#) and [Dashboard 2: Fatal vs. non-fatal burden](#).

Non-fatal burden (YLD)

Key messages

- In 2022, First Nations people lost 158,693 years of healthy life due to the impact of living with disease and injury (non-fatal burden), or 155 YLD per 1,000 people. This accounted for half (50%) of the total burden.
- In 2022, the main disease groups contributing to non-fatal burden for First Nations people were mental health conditions & substance use disorders, musculoskeletal conditions and respiratory diseases.
- At the individual disease level, the leading causes of non-fatal burden were anxiety disorders (10% of non-fatal burden), depressive disorders (6.9%) and asthma (5.7%).
- First Nations females experienced slightly more of the non-fatal disease burden (52% of YLD) than First Nations males (48%) in 2022.

In 2022, First Nations people lost 158,693 years of healthy life due to the impact of living with disease and injury (non-fatal burden), or 155 YLD per 1,000 people. This accounted for half (50%) of the total burden.

To explore the contribution of non-fatal burden for each disease group, see the interactive data visualisation: [Dashboard 1: Burden of disease in Australia](#). This visualisation provides total, fatal and non-fatal burden numbers and rates both overall and for each disease group by sex and age.

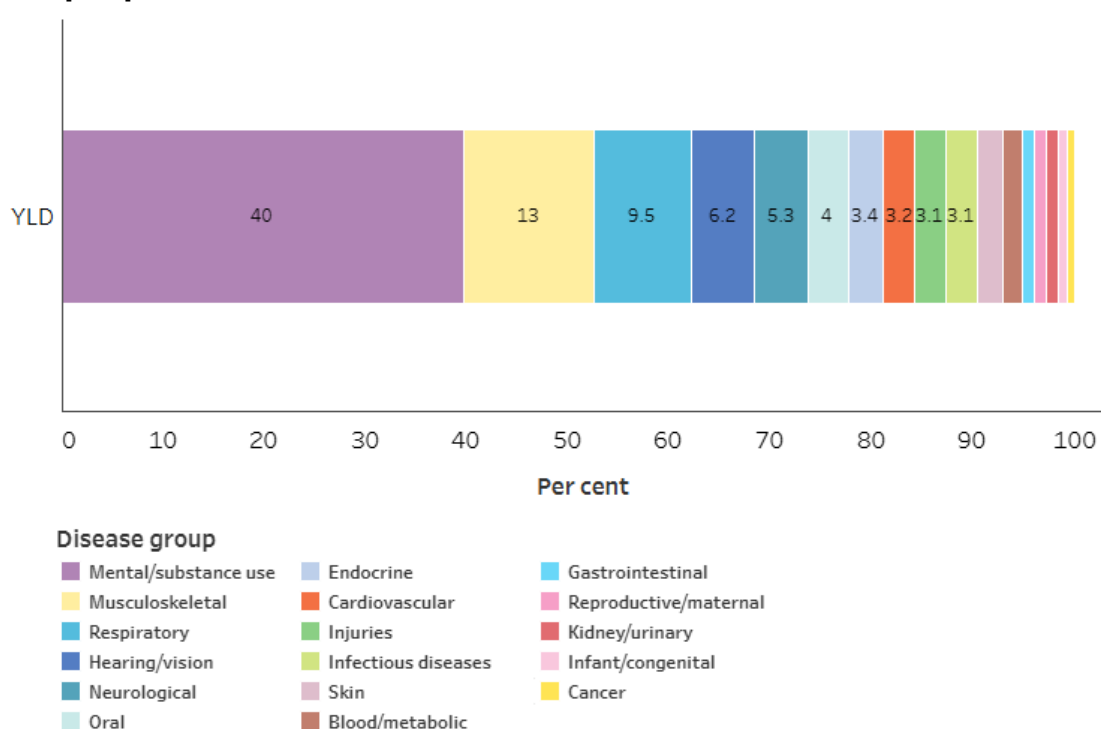
Mental health conditions & substance use disorders were the main causes of non-fatal burden

In 2022, the main disease groups contributing to non-fatal burden for First Nations people were:

- mental health conditions & substance use disorders (40%)
- musculoskeletal conditions (13%)
- respiratory diseases (9.5%)
- hearing & vision disorders (6.2%)
- neurological conditions (5.3%).

Together, these 5 disease groups accounted for about three-quarters (74%) of the non-fatal burden in First Nations people (Figure 10).

Figure 10: Proportion (%) of non-fatal burden (YLD) by disease group, First Nations people, 2022



<http://www.aihw.gov.au/>

Source: AIHW First Nations Burden of Disease Database

Top specific diseases contributing to non-fatal burden

At the individual disease level, the leading 5 causes of non-fatal burden were:

- anxiety disorders (10% of non-fatal burden)
- depressive disorders (6.9%)
- asthma (5.7%)
- alcohol use disorders (5.5%)
- back pain & problems (5.3%).

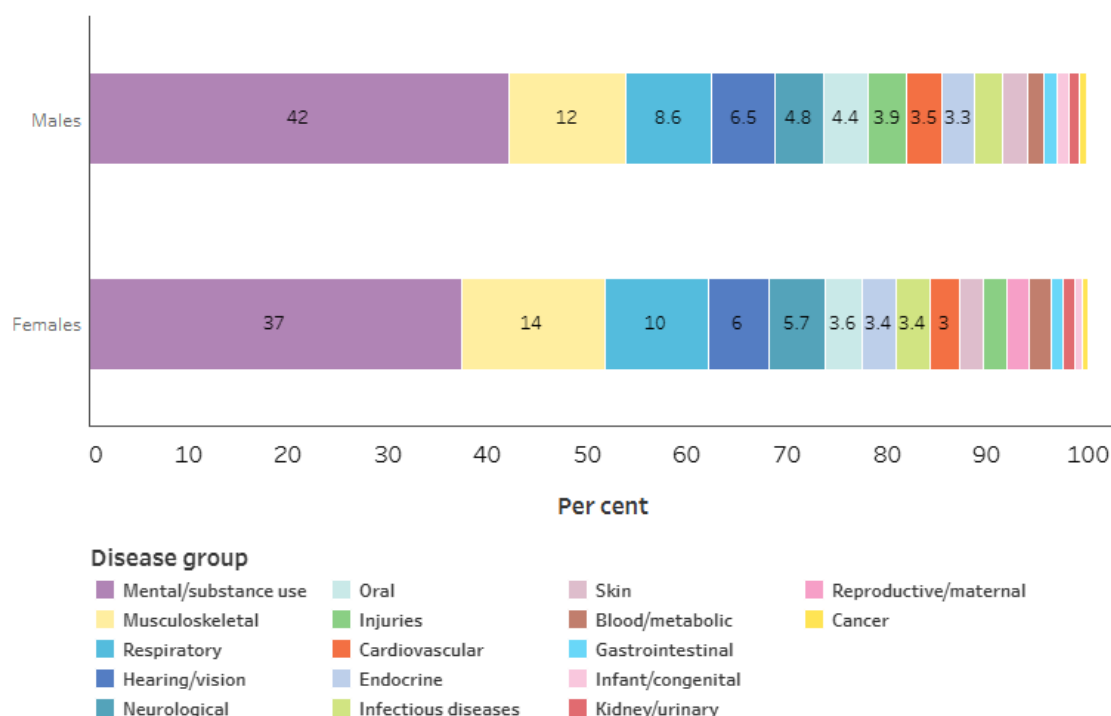
How does non-fatal burden differ between males and females?

First Nations females experienced slightly more of the non-fatal disease burden (52% of YLD) than First Nations males (48%) in 2022.

Mental health conditions & substance use disorders was the greatest contributor to non-fatal burden for both sexes. The other main disease groups contributing to non-fatal burden for males and females were musculoskeletal conditions, respiratory diseases, hearing & vision disorders and neurological conditions (Figure 11).

Together these 5 disease groups accounted for 74% of non-fatal burden in males and in females.

Figure 11: Proportion (%) of non-fatal burden (YLD) by disease group and sex, First Nations people, 2022



<http://www.aihw.gov.au/>

Source: AIHW First Nations Burden of Disease Database

Top specific causes contributing to non-fatal burden by sex

In 2022, the leading specific causes of non-fatal burden among First Nations males were:

- anxiety disorders (8.3% of non-fatal burden)
- alcohol use disorders (7.0%)
- depressive disorders (6.3%).

Among First Nations females, the leading specific causes were:

- anxiety disorders (11.5%)
- depressive disorders (7.5%)
- asthma (6.0%).

First Nations males experienced higher rates of non-fatal burden due to autism spectrum disorders (3.2 times), schizophrenia (2.2 times) and drug use disorders (2.0 times) compared with First Nations females. First Nations females experienced higher rates of non-fatal burden due to migraine (2.3 times), bipolar affective disorders (2.2 times),

osteoarthritis (1.8 times) and anxiety disorders (1.5 times) compared with First Nations males.

To further explore the leading specific causes of non-fatal burden, see the interactive data visualisation: [Dashboard 4: Leading causes of disease burden](#). This visualisation shows the top 20 contributors to total, fatal and non-fatal burden based on age-standardised rates in 2011, 2018 and 2022 for males, females and persons, and how this has changed over time.

Fatal burden (YLL)

Key messages

- In 2022, there were an estimated 4,932 deaths of First Nations people, which resulted in 158,389 YLL (fatal burden), or 155 YLL per 1,000 people. Fatal burden accounted for 50% of the total burden of disease.
- Injuries (22%), cancer (21%) and cardiovascular diseases (19%) caused most of the fatal burden for First Nations people in 2022.
- At the individual disease level, the leading 5 causes of fatal burden were coronary heart disease (11% of fatal burden), suicide & self-inflicted injuries (9.0%) and lung cancer (5.5%).
- First Nations males experienced more of the fatal disease burden (58% of YLL) than First Nations females (42%) in 2022.

In 2022, there were an estimated 4,932 deaths of First Nations people, which resulted in 158,389 YLL (fatal burden), or 155 YLL per 1,000 people. Fatal burden accounted for 50% of the total burden of disease.

To explore the contribution of fatal burden for each disease group, see the interactive data visualisation: [Dashboard 1: Burden of disease in Australia](#). This visualisation provides total, fatal and non-fatal burden numbers and rates both overall and for each disease group by sex and age.

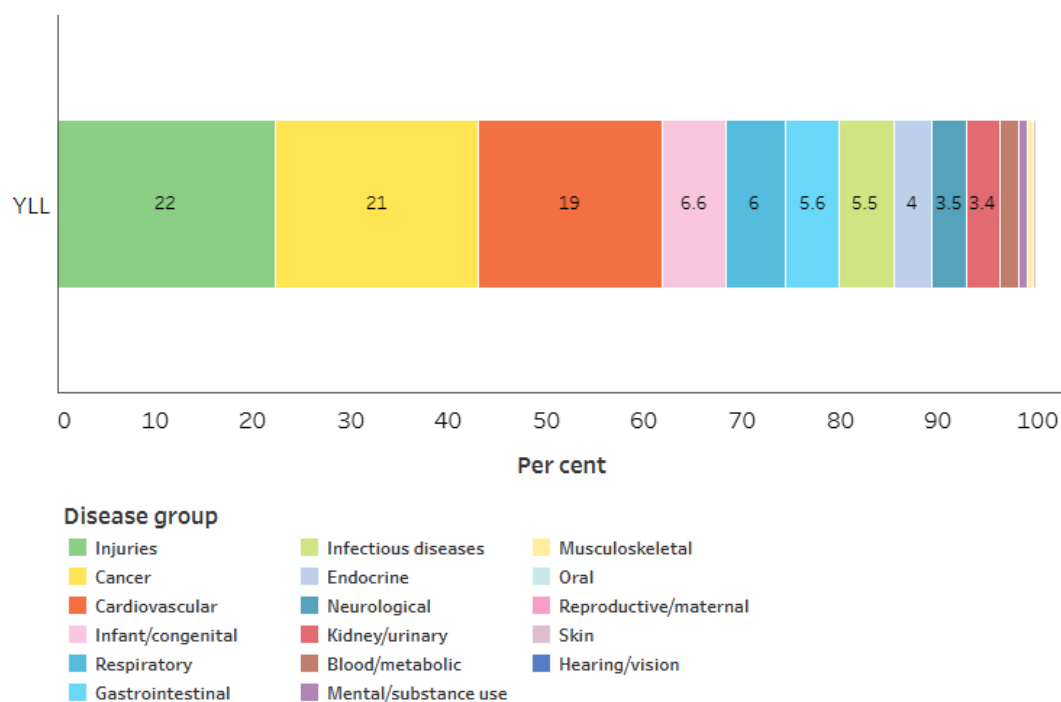
Injuries, cancer and cardiovascular diseases caused most of the fatal burden

Injuries (22%), cancer (21%) and cardiovascular diseases (19%) caused most of the fatal burden for First Nations people in 2022. Together, these 3 disease groups accounted for 62% of the fatal burden in First Nations people (Figure 12).

Other disease groups that contributed substantially to fatal burden were:

- infant & congenital conditions (6.6%)
- respiratory diseases (6.0%)
- gastrointestinal disorders (5.6%)
- infectious diseases (5.5%).

Figure 12: Proportion (%) of fatal burden (YLL) by disease group, First Nations people, 2022



<http://www.aihw.gov.au/>

Note: Hearing & vision disorders are excluded as they did not cause any fatal burden.

Source: AIHW First Nations Burden of Disease Database

Top specific diseases contributing to fatal burden

At the individual disease level, the leading 5 causes of fatal burden were:

- coronary heart disease (11% of fatal burden)
- suicide & self-inflicted injuries (9.0%)
- lung cancer (5.5%)
- chronic obstructive pulmonary disease (COPD) (4.8%)
- poisoning (such as the toxic effects of medicinal or other substances) (4.5%).

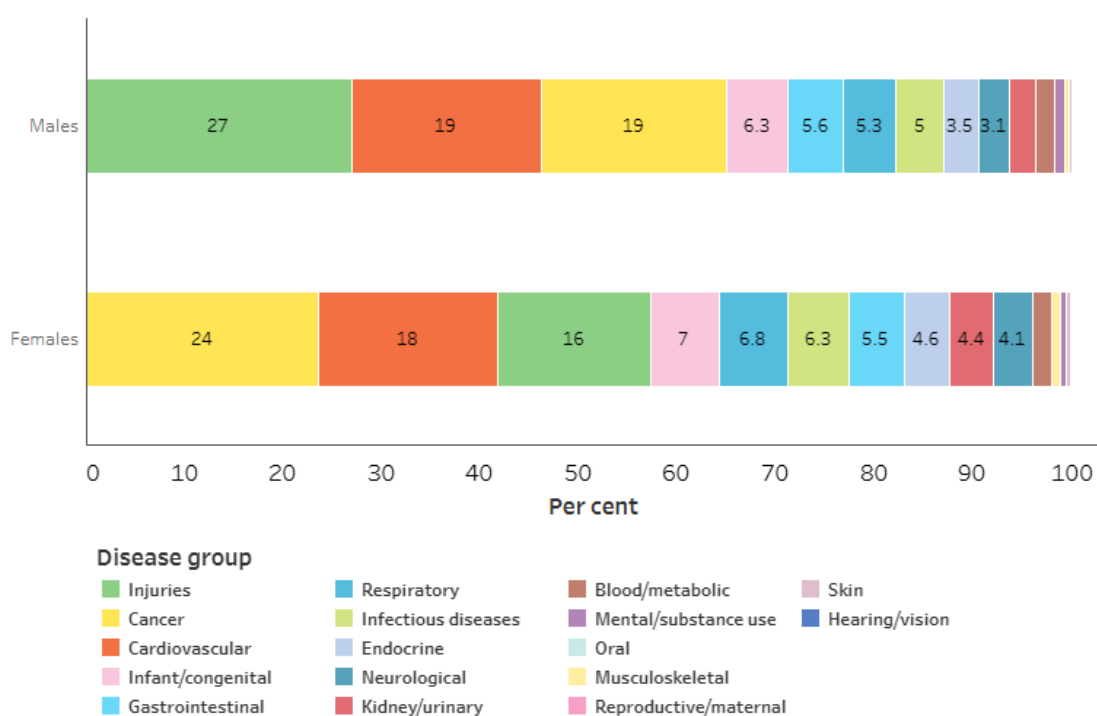
How does fatal burden differ between males and females?

First Nations males experienced more of the fatal disease burden (58% of YLL) than First Nations females (42%) in 2022.

Injuries, cardiovascular diseases and cancer & other neoplasms were the leading 3 contributors to fatal burden for both males and females, however the disease group rankings and the proportion of fatal burden that each contributed were different (Figure 13).

Injuries was the leading cause of fatal burden for males, accounting for over a quarter (27%) of fatal burden among males, but was the third leading cause for females, accounting for 16% of fatal burden among females. Cancer & other neoplasms was the leading cause of fatal burden for females and was the third leading cause for males, accounting for 24% and 19% of fatal burden, respectively.

Figure 13: Proportion (%) of fatal burden (YLL) by disease group and sex, First Nations people, 2022



<http://www.aihw.gov.au/>

Note: Hearing & vision disorders are excluded as they did not cause any fatal burden.

Source: AIHW First Nations Burden of Disease Database

Top specific causes contributing to fatal burden by sex

In 2022, the leading specific causes of fatal burden among First Nations males were:

- coronary heart disease (12% of fatal burden)
- suicide & self-inflicted injuries (11%)
- poisoning (5.3%).

Among First Nations females, the leading specific causes were:

- coronary heart disease (8.7%)
- lung cancer (6.3%)
- suicide & self-inflicted injuries (5.8%).

First Nations males experienced higher rates of fatal burden due to oesophageal cancer (3.4 times), suicide & self-inflicted injuries (2.9 times), cardiomyopathy (2.8 times), poisoning (2.1 times) and coronary heart disease (1.7 times) compared with First Nations females. First Nations females experienced higher rates of fatal burden due to dementia and atrial fibrillation and flutter (each 1.3 times) compared with First Nations males.

To further explore the leading specific causes of fatal burden, see the interactive data visualisation: [Dashboard 4: Leading causes of disease burden](#). This visualisation shows the top 20 contributors to total, fatal and non-fatal burden based on age-standardised rates in 2011, 2018 and 2022 for males, females and persons, and how this has changed over time.

Changes in burden over time

Key messages

- There was a 6.3% decrease in the age-standardised rate of total burden between 2011 and 2022, from 457 to 429 DALY per 1,000 people.
- The decrease in total burden was driven by a reduction (of 11%) in the age-standardised rate of fatal burden between 2011 and 2022, from 262 to 233 YLL per 1,000 people.
- There was no substantial change in the age-standardised rate of non-fatal burden between 2011 and 2022.
- Between 2011 and 2022 there were notable decreases in the age-standardised total burden rate for cardiovascular diseases (decrease of 21 DALY per 1,000 people), endocrine disorders (decrease of 7.2 DALY per 1,000), and musculoskeletal conditions (decrease of 7.0 DALY per 1,000)
- Between 2011 and 2022 there were notable increases in the age-standardised total burden rate for infectious diseases (increase of 8.5 DALY per 1,000) and mental health conditions & substance use disorders (increase of 6.5 DALY per 1,000). Most of the increase in burden due to infectious diseases was due to the emergence of COVID-19.
- Although coronary heart disease (CHD) remained the leading cause of disease burden in 2022, the total burden age-standardised rate for CHD fell by 30% between 2011 and 2022, from 45 to 32 DALY per 1,000 people.

Overall, the health of First Nations people has improved over the period from 2011 to 2022.

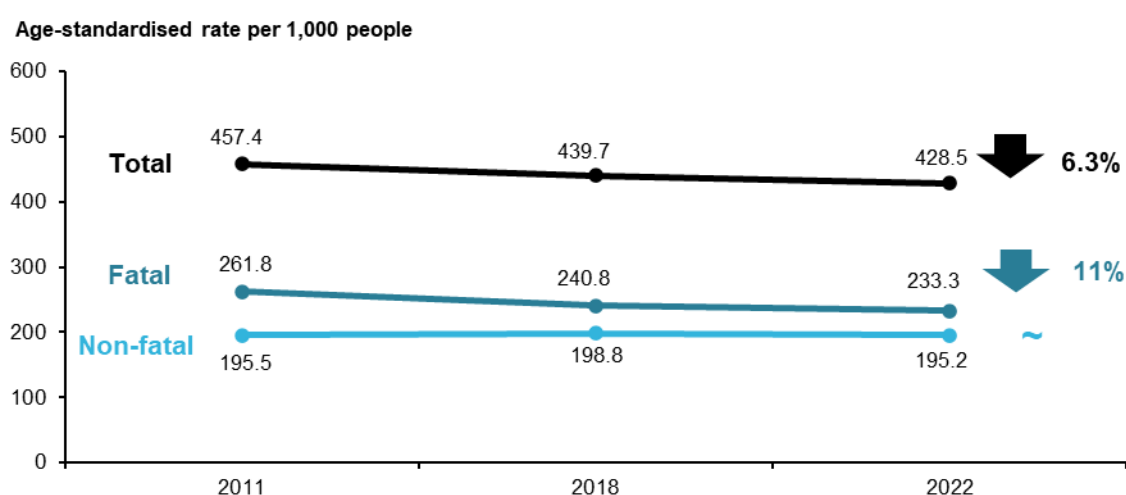
After accounting for the increase in size and ageing of the First Nations population (by using age-standardised rates), there was a 6.3% decrease in the rate of total burden between 2011 and 2022, from 457 to 429 DALY per 1,000 people. Most of this decline was observed between 2011 and 2018, while the DALY rate remained relatively stable between 2018 and 2022 (Figure 14).

The decrease in total burden was driven by a reduction (of 11%) in the age-standardised rate of fatal burden between 2011 and 2022, from 262 to 233 YLL per 1,000 people. There was no substantial change in the age-standardised rate of non-fatal burden between 2011 and 2022 (Figure 14).

Note that this stability from 2018 to 2022 may be attributed to the COVID-19 pandemic which had both direct health effects from the virus itself, and indirect health effects from COVID-19 acting as a risk factor for other diseases, and as a result of the public health measures and restrictions put in place (AIHW 2022). Due to the impact of these indirect health effects, simply subtracting the estimated disease burden due to COVID-19 from the total burden does not necessarily reflect the disease burden that would have been experienced if the COVID-19 pandemic did not occur.

To explore changes in disease burden by disease group and leading causes see the interactive data visualisation [Dashboard 3: Comparisons over time](#). This visualisation presents comparisons of age-standardised and age-specific rates of total, fatal and non-fatal burden by year, sex and disease group.

Figure 14: Change between 2011 and 2022 in the age-standardised total burden (DALY), fatal burden (YLL), and non-fatal burden (YLD) rate (per 1,000 people), First Nations people



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

Source: AIHW First Nations Burden of Disease Database

Changes by disease group

Between 2011 and 2022 there were decreases in the age-standardised total burden rate in around half of the 17 disease groups. The most notable decreases in DALY were for:

- cardiovascular diseases – a decrease of 21 DALY per 1,000 people, or 26%
- endocrine disorders – a decrease of 7.2 DALY per 1,000, 28%
- musculoskeletal conditions – a decrease of 7.0 DALY per 1,000, 18%
- cancer & other neoplasms – a decrease of 4.9 DALY per 1,000, 8.0%.

Increases were observed for infectious diseases (increase of 8.5 DALY per 1,000, or 74%) and mental health conditions & substance use disorders (increase of 6.5 DALY per 1,000, 11%). Most of the increase in burden due to infectious diseases was due to the emergence of COVID-19.

Non-fatal burden

Most disease groups showed little change in the age-standardised rate of non-fatal burden between 2011 and 2022. The largest increase in YLD was for:

- mental health conditions & substance use disorders – an increase of 7.9 YLD per 1,000 people, or 14%.

The largest decreases in the age-standardised rate of non-fatal burden were for:

- musculoskeletal conditions – a decrease of 6.9 YLD per 1,000, or 19%
- hearing & vision disorders – a decrease of 4.8 YLD per 1,000, 27%.

Fatal burden

Over the period 2011 to 2022, there were large reductions in the age-standardised rate of fatal burden from:

- cardiovascular diseases – a decrease of 19 YLL per 1,000 people, or 28%
- endocrine disorders – a decrease of 7.4 YLL per 1,000, 42%
- cancer & other neoplasms – a decrease of 5.1 YLL per 1,000, 8.6%.

There was an increase in the age-standardised rate of fatal burden due to infectious diseases of 7.0 YLL per 1,000, or 89%, primarily due to the emergence of COVID-19.

To explore the changes over time in the DALY, YLD, and YLL for each disease group, see the interactive data visualisation: [Dashboard 3: Comparisons over time](#).

Changes in leading specific causes

The 15 leading causes of total burden, based on age-standardised DALY rate, among First Nations people remained largely the same between 2011 and 2022, except for the introduction of COVID-19 in 2022 (Figure 15).

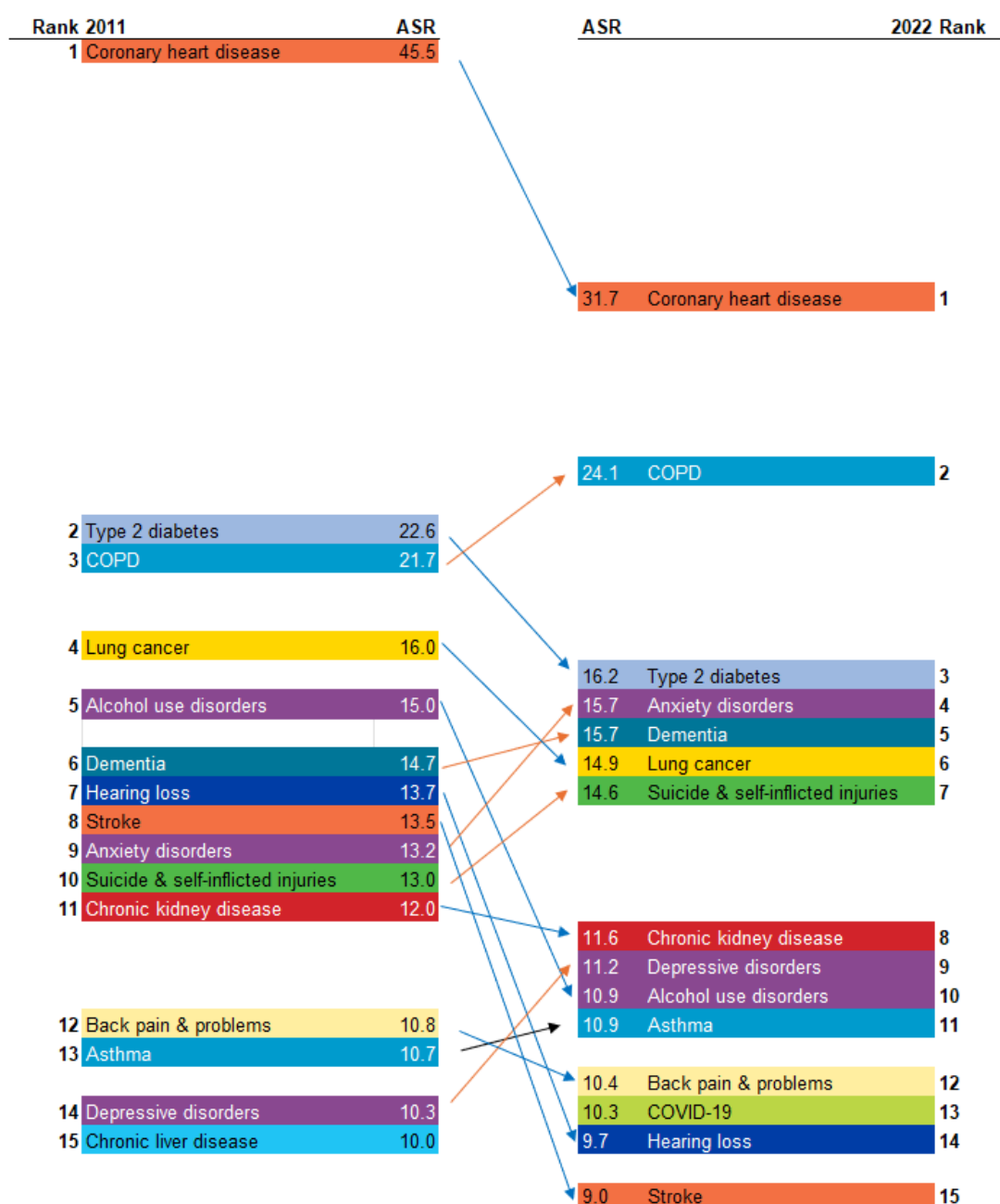
Coronary heart disease was the leading cause of burden among First Nations people in both 2011 and 2022. Although coronary heart disease remained the leading cause of disease burden in 2022, the age-standardised total burden rate fell by 30% between 2011 and 2022 (from 45 to 32 DALY per 1,000 people).

Age-standardised total burden rates also decreased notably for:

- stroke (33% decrease)
- hearing loss (29% decrease)
- type 2 diabetes (28% decrease)
- alcohol use disorders (27% decrease).

To explore the changes in leading specific causes of total, non-fatal and fatal burden over time, see the interactive data visualisation: [Dashboard 4: Leading causes of disease burden](#). This visualisation shows the top 20 contributors to total, fatal and non-fatal burden based on age-standardised rates in 2011, 2018 and 2022 for males, females and persons, and how this has changed over time.

Figure 15: Change in ranking and age-standardised DALY rate (DALY per 1,000 people), leading specific causes of burden, First Nations people, 2011 and 2022



ASR = Age-standardised rate

Notes:

1. An increase in rank over time does not always mean the disease or injury has increased in the population, and vice versa. Therefore, changes in ranking of causes of deaths and disease burden over time should be interpreted with caution.
2. Causes are presented in descending order, from highest ASR to lowest ASR, with arrows indicating either an increase (orange), decrease (blue) or no change (black) in the ASR over time.

3. Causes ranked in the leading 15 causes in 2011, which are not among the leading 15 causes in 2022 will not have connecting lines and rankings.

4. Cause rankings exclude 'other' residual conditions from each disease group; for example, 'other musculoskeletal conditions'.

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

Source: AIHW First Nations Burden of Disease Database

References

AIHW (Australian Institute of Health and Welfare) (2022) [Australia's health 2022: data insights](#), AIHW, Australian Government, accessed 15 October 2025. doi:10.25816/ggvz-vr80.

Interactive data on disease burden

The following interactive data visualisations allow users to explore the data in more detail and filter/customise the data and figures to meet their information needs.

The AIHW aims to meet the Australian Government's [web accessibility requirements](#). If any of the interactive burden of disease pages are inaccessible to you, or you are experiencing problems accessing content for any reason, please contact us at Indigenusbod@aihw.gov.au.

What is included in the First Nations Burden of Disease Study 2022 data visualisations?

The interactive data visualisations present estimates of total burden (DALY), non-fatal burden (YLD), and fatal burden (YLL) for First Nations people in Australia for 2011, 2018 and 2022.

The following interactive data visualisations are included:

[Overview of disease burden, for all disease groups](#)

[Contributions of fatal vs non-fatal burden to total burden for disease group](#)

[Comparison of disease burden over time for a disease group](#)

[Changes in the ranking of leading causes \(specific disease/injury\) of disease burden over time by sex](#)

[Summary of disease burden for a specific disease or injury](#)

How to navigate the interactive visualisation

Use the drop-down list above each graph to view the data by options including measure of disease burden, year, sex, and disease group.

Select from the following:

Measure:	Year:	Sex:	Disease group:
DALY	2022	Persons	(All)

Hover over the bars, line or coloured tiles on the charts for additional information.

The toolbar at the bottom of the data dashboards enables users to interact with the data in different ways:



Undo = Undo the filter

Redo = Redo the filter

Reset = Clears all filters and resets visualisation to defaults

Refresh = Refreshes the data

Pause = Pauses the data (filters do not work if this button is selected)

Share = Generates a link that can be shared (note that filters will not be applied when link is shared)

Download = Allows a downloadable file as either an image (PNG), PDF or PowerPoint file. This is a useful way to save snapshots of the data to include in a document or presentation.

Full screen = Displays the dashboard in full screen mode (press Esc to return to original view)

Burden of disease in Australia

Use the interactive graphs to explore the number or rate of total burden (DALY), non-fatal burden (YLD) and fatal burden (YLL) among First Nations people by disease group for the most recent year (2022). Results for 2011 and 2018 are included for comparison.

Dashboard 1: Burden of disease in Australia

Burden of disease among First Nations people 2022

Select from the following:

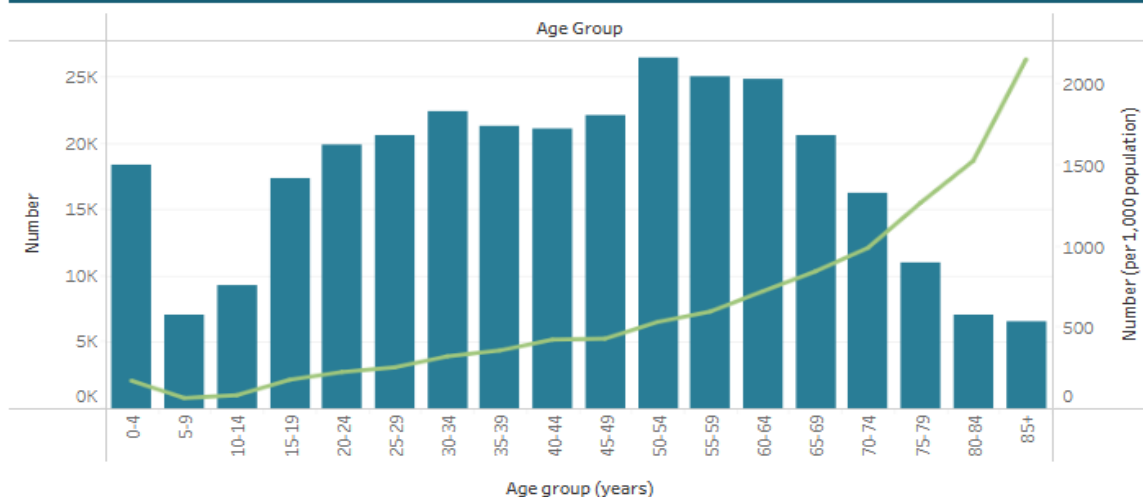
Measure:	Year:	Sex:	Disease Group:
DALY	2022	Persons	(All)

DALY= Disability-adjusted life years; YLD= Years lived with disability; YLL= Years of life lost



Nationally in 2022, there were 317,083 DALY in First Nations people from the disease/s selected, equivalent to 310.6 per 1,000 population (crude rate)

DALY in First Nations people by age, 2022

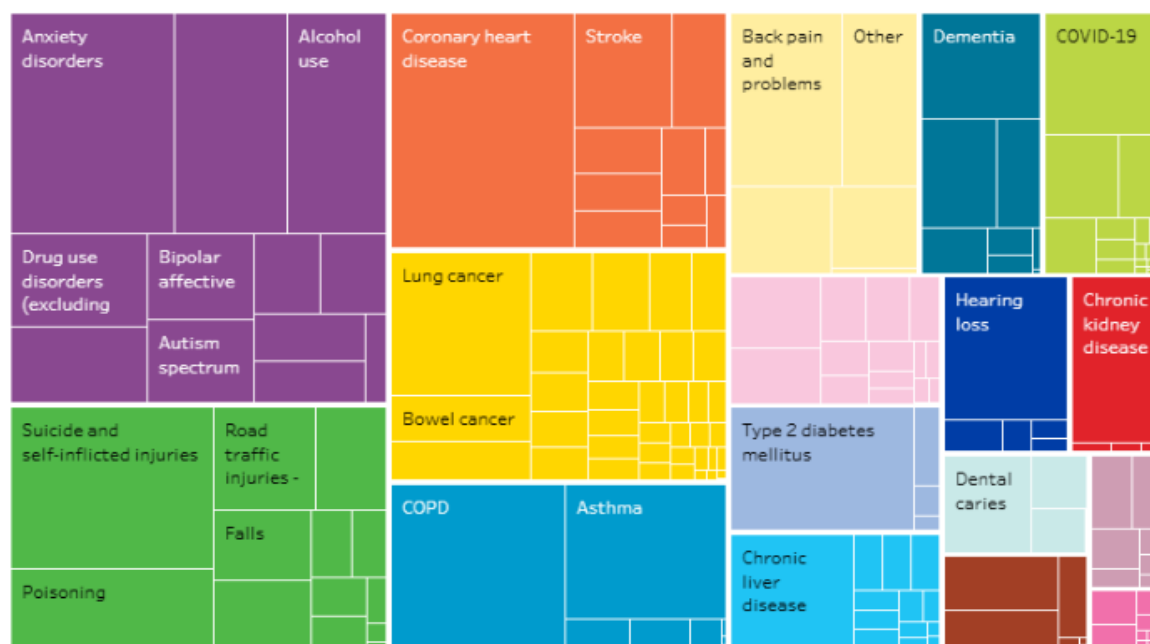


DALY in First Nations people by disease, 2022

Disease group

Blood and metabolic disorders	Infant and congenital conditions	Neurological conditions
Cancer and other neoplasms	Infectious diseases	Oral disorders
Cardiovascular diseases	Injury (external cause)	Reproductive and maternal conditions
Endocrine disorders	Kidney and urinary diseases	Respiratory diseases
Gastrointestinal disorders	Mental/substance use	Skin disorders
Hearing and vision disorders	Musculoskeletal conditions	

Hover over boxes for more information.



Notes:

1. Rates were age-standardised to the 2001 Australian Standard Population and are expressed as per 1,000 population.
2. As burden of disease estimates are to some extent based on modelled deaths and prevalence data, individuals cannot be identified where there are small numbers reported.
3. Estimates for anxiety and depressive disorders relate to people aged 4 years and over only. Estimates for suicide relate to people aged 9 years and over only.

Source: AIHW First Nations Burden of Disease Database. <http://www.aihw.gov.au>

Fatal vs. non-fatal burden

Burden of disease estimates are one of the only population health measures which combines health loss from living with, and dying prematurely from, illness and injury.

The contribution of fatal (YLL) and non-fatal burden (YLD) to the total burden (DALY) experienced among First Nations people in Australia differs by age, sex and disease. Some disease groups, such as cancers, contribute substantial fatal burden, whilst diseases which don't usually cause death, such as back pain, contribute substantial non-fatal burden.

Use the interactive graph to explore the contribution of fatal and non-fatal burden to the total burden of disease among First Nations people for 2011, 2018 and 2022 by sex, age group and disease group.

Dashboard 2: Fatal vs non-fatal burden

Burden of disease among First Nations people 2022

Select from the following:

Year: Sex: Disease group:

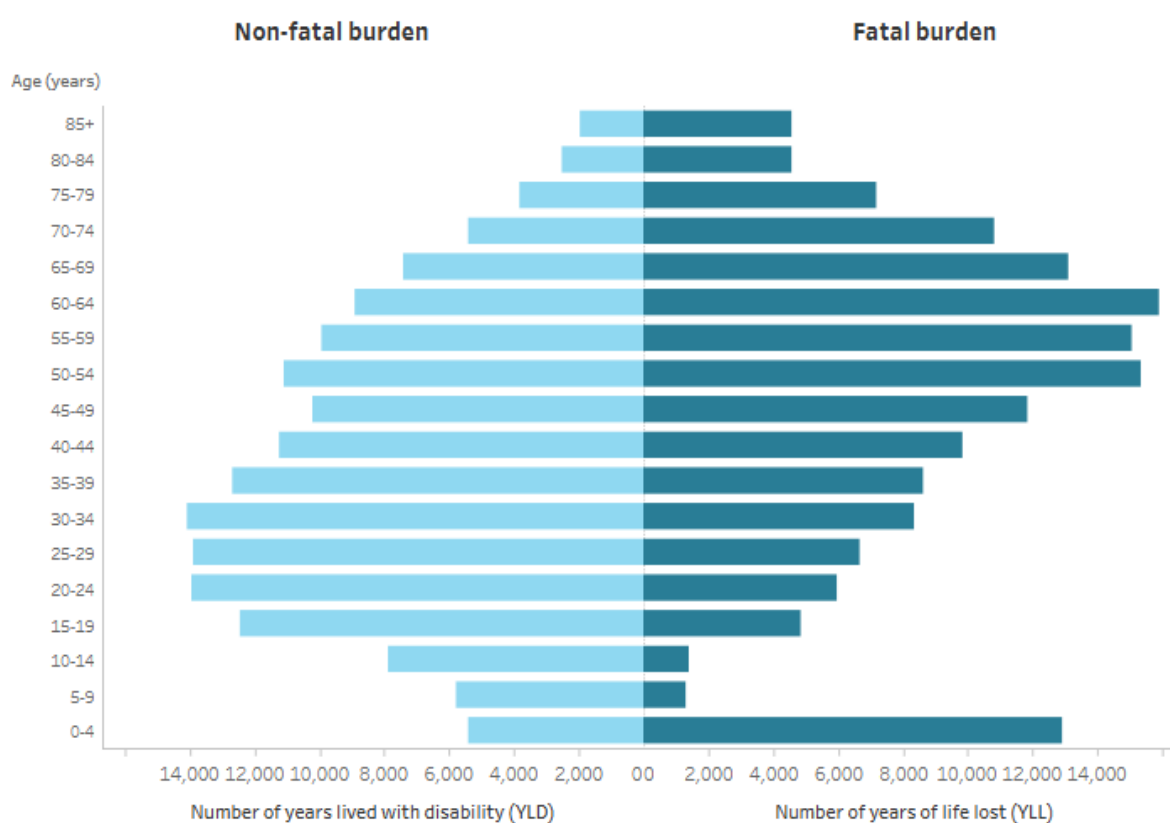
Fatal vs. Non-fatal burden in First Nations people, 2022

50.0% non-fatal

50.0% fatal



Fatal vs. Non-fatal burden by age, First Nations people, 2022



Source: AIHW First Nations Burden of Disease Database. <http://www.aihw.gov.au>

Comparisons over time

Changes in burden over time from specific diseases or injuries may be due to changes in population size, population ageing, changes in disease prevalence, epidemics or changes to how causes are reported or coded in health data.

The estimates for 2011 and 2018 in the FNBDS 2022 cannot be compared with those for 2011 and 2018 from previous Australian studies as methods and data sources may have been updated in the most recent study.

Use the interactive graphs to explore differences in age-standardised and age-specific rates of burden (DALY, YLD or YLL) in Australia for 2011, 2018 and 2022. Estimates are displayed by sex and for disease groups.

Dashboard 3: Comparisons over time

Burden of disease among First Nations people 2022

Select from the following:

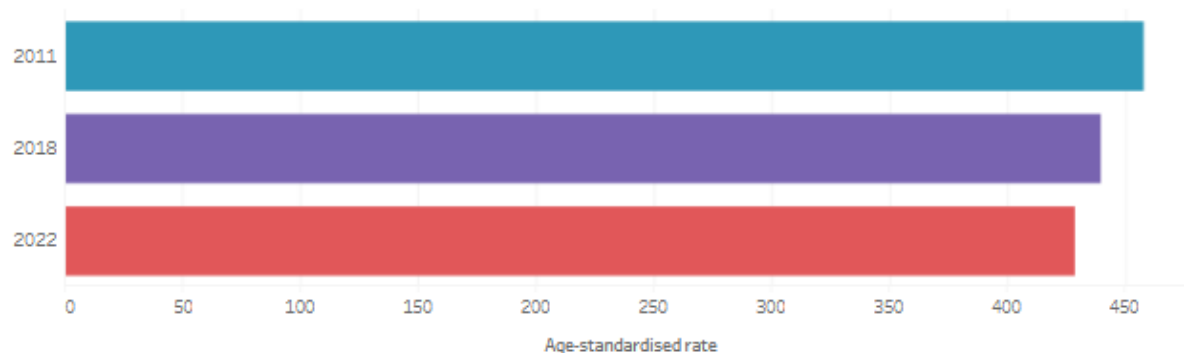
Measure:	Sex:	Start year:	End year:	Disease group:
DALY	Persons	2011	2022	(All)

DALY= Disability-adjusted life years; YLD= Years lived with disability; YLL= Years of life lost

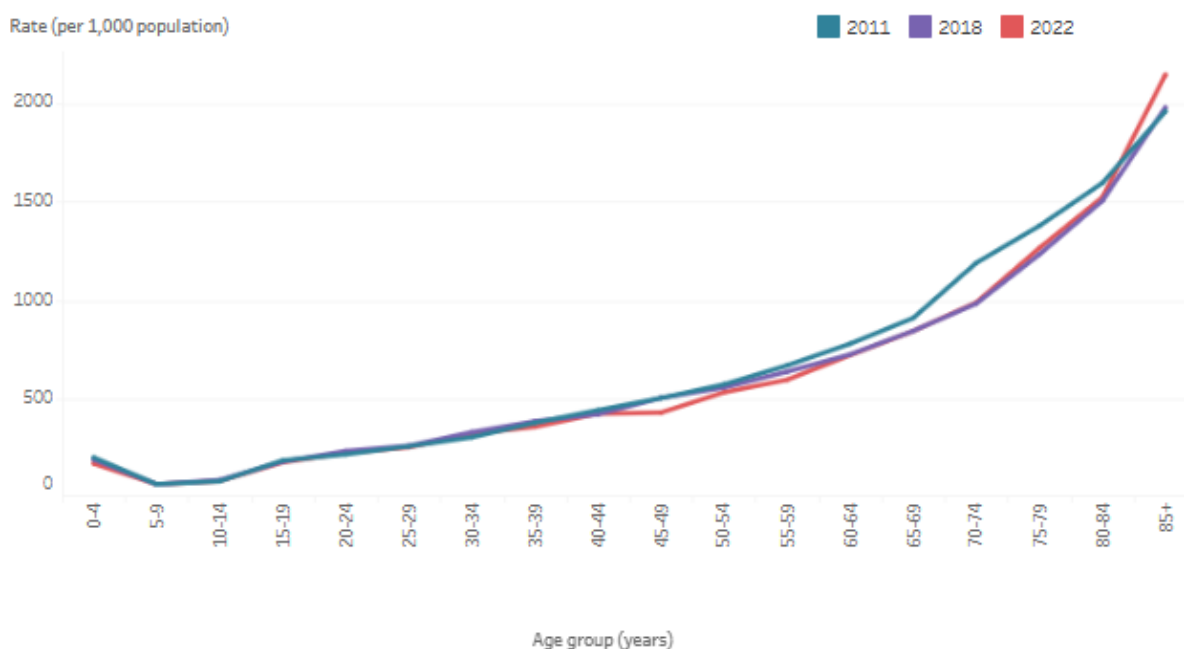
6.3% decrease

in the DALY rate between 2011 and 2022 for the disease/s selected

Comparison of age-standardised DALY rates: First Nations people



Comparison of age-specific DALY rates: First Nations people



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

Source: AIHW First Nations Burden of Disease Database. <http://www.aihw.gov.au>

Leading causes of disease burden

Ranking diseases by burden shows the leading causes of health loss for the First Nations population. Changes in rankings over time may be due to changes in disease prevalence, epidemics or changes to how causes of data is collected, reported or coded.

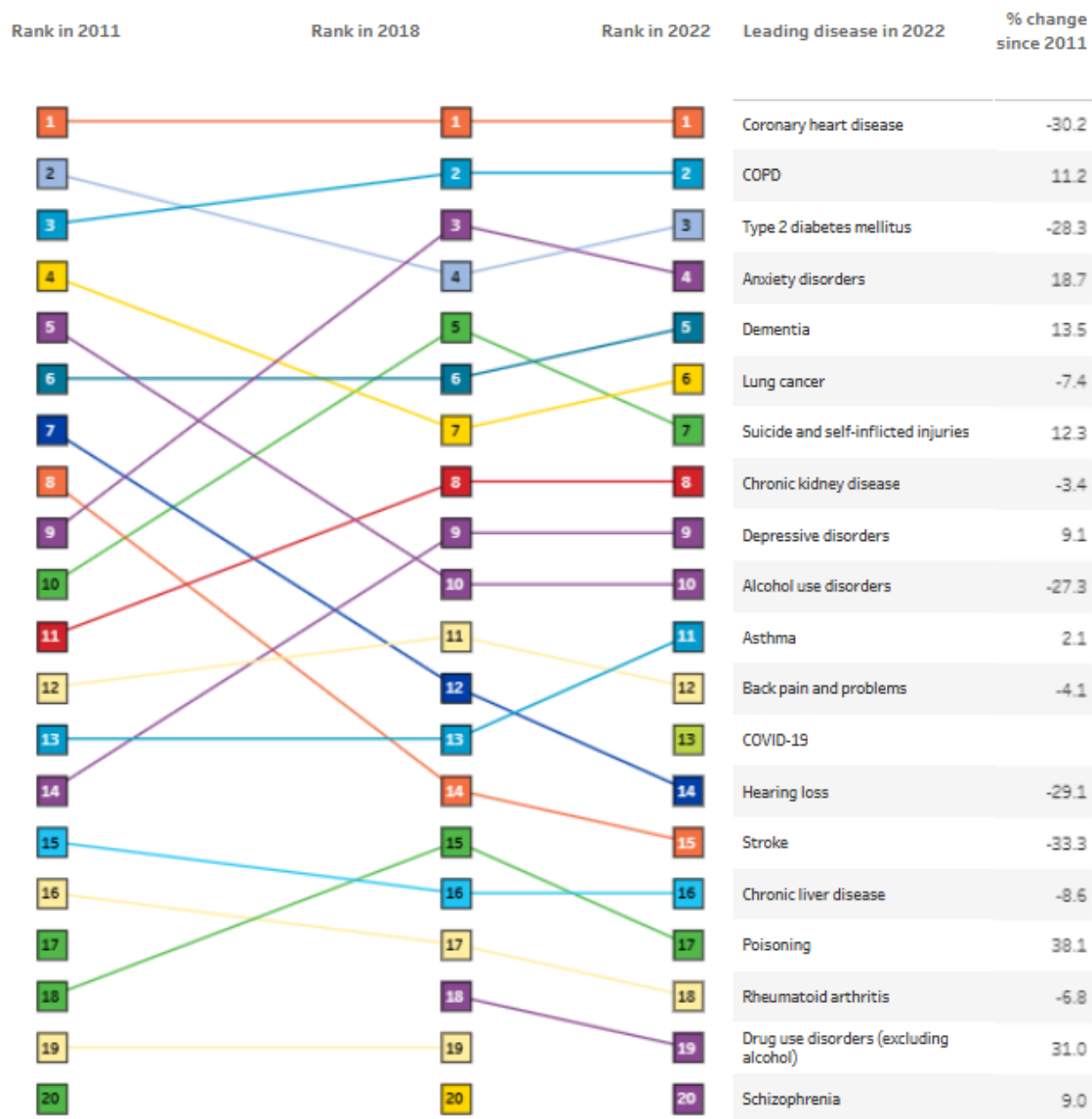
In this interactive graph, leading causes of death and disease burden (YLL, YLD or DALY) can be ranked by the number or by the age-standardised rate (ASR) in the population.

Note that an increase in rank over time does not always mean the disease or injury has increased in the population, and vice versa. Therefore, changes in ranking of causes of deaths and disease burden over time should be interpreted with caution. In addition, leading causes of fatal burden in this data visualisation is based on First Nations Burden of Disease Study 2022 methods and will not be comparable to other reports of leading causes of death due to modelling and cause of death alignment to diseases. Further, estimates for COVID-19 have no ranking in previous years which were prior to the pandemic (2011 and 2018).

Use the 'Rank by ASR' interactive graph to explore the leading 20 causes of disease burden (YLL, YLD or DALY) among First Nations people for 2011, 2018 and 2022, or the 'Rank by number' interactive graph to explore rankings by number of YLL, YLD or DALY. The 'Rank by number' graph ranks diseases/injuries using raw numbers that have not been adjusted to take into account population age structure. The 'Rank by ASR' graph ranks diseases/injuries by age-standardised rates which take into account differences in population age structure and allows for more accurate comparisons.

Dashboard 4: Leading causes of disease burden





Notes:

1. Rates were age-standardised to the 2001 Australian Standard Population and are expressed as per 1,000 population.
2. Diseases ranked in the leading 20 in 2011 which are not ranked in 2018 and 2022 will not have connecting lines and rankings.

Source: AIHW First Nations Burden of Disease Database. <http://www.aihw.gov.au>

Disease/injury-specific summary

How to use the interactive visualisation

Use the interactive graphs to generate a summary of total burden (DALY) in Australia in 2022 for the top 50 specific diseases or injury by number of DALY among First Nations people.

How to use the interactive visualisation

Select a specific disease or injury using the drop-down list to filter the data displayed in the visualisation.

Top 50 causes (DALY)

Coronary heart disease ▼

Click on the 'Download PDF' button to download a 1 page PDF for the selected disease/injury.

Download PDF

Select A4 in the Page Size drop-down.

Download PDF

×

Include

This View ▼

Scaling

Automatic ▼

Page Size

A4 ▼

Orientation

Portrait ▼

Download

An alternative is to use the 'Download' button at the bottom of the dashboard to generate image (PNG) or PDF versions of the dashboard.

Dashboard 5: Disease/injury specific

Burden of disease among First Nations people 2022

Top 50 causes (DALY)

Coronary heart disease (rank 1)

Coronary heart disease ▼

For First Nations persons in Australia in there were:
19,023 DALY, equivalent to 18.6 per 1,000 population

[Download PDF](#)

Fatal burden
16,638 YLL,
equivalent to 16.3 per 1,000 population

Non-fatal burden
2,386 YLD,
equivalent to 2.3 per 1,000 population

DALY = Disability-adjusted life years; YLD = Years lived with disability; YLL = Years of life lost

Fatal vs. Non-fatal burden in First Nations persons, 2022

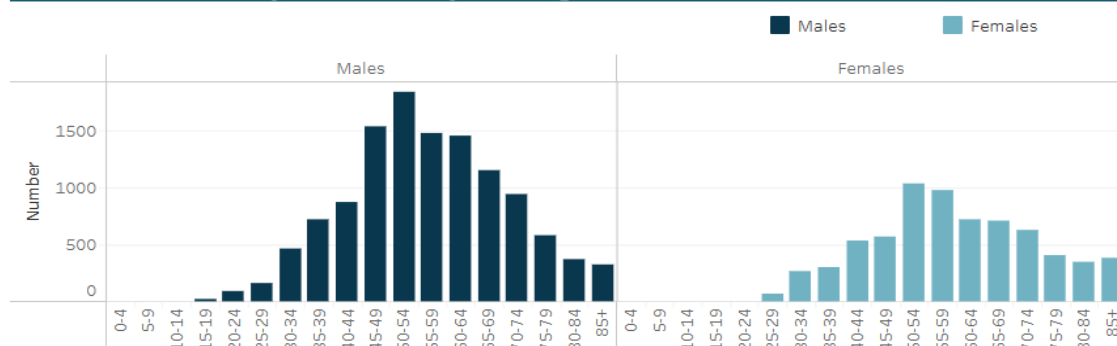
87.5% Fatal

12.5% Non-fatal

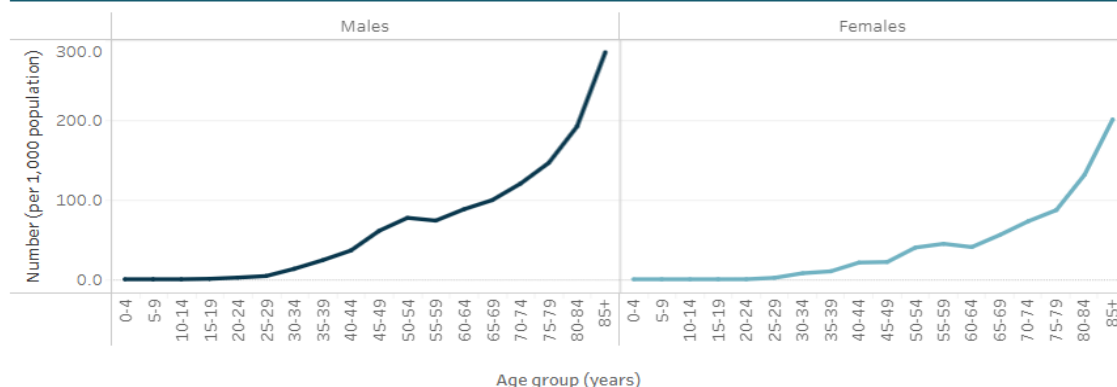
Age-standardised rates (ASRs) over time

	Males			Females		
	2011	2018	2022	2011	2018	2022
DALY ASRs (per 1,000 pop)	62.5	46.5	41.6	30.6	24.5	23.0
YLL ASRs (per 1,000 pop)	56.8	41.9	36.9	26.3	21.1	19.3
YLD ASRs (per 1,000 pop)	5.7	4.6	4.7	4.3	3.5	3.7

Number of DALY, Coronary heart disease, by sex and age, 2022



DALY Coronary heart disease rates by sex and age, 2022



Notes:

1. Rates presented are crude rates unless otherwise stated and are expressed as per 1,000 population.
2. Age-standardised rates were age-standardised to the 2001 Australian Standard Population.
3. Diseases displaying a rate of 0.0 per 1,000 population refer to a rate <0.05 per 1,000 population.
4. Other residual conditions have been excluded from the top 50 causes by DALY.
5. As burden of disease estimates are to some extent based on modelled deaths and prevalence data, individuals cannot be identified where there are small numbers reported.

Source: AIHW First Nations Burden of Disease Database. <http://www.aihw.gov.au>

Technical notes

Overarching methods

General methods for estimation of burden of disease can be found in [Australian Burden of Disease Study: methods and supplementary material 2018](#) (AIHW 2021b).

Data sources

Mortality data to calculate 'years of life lost' (fatal burden, YLL) estimates were sourced from the AIHW's National Mortality Database (NMD). Given the high quality of these data, no modelling had to be undertaken to adjust for coverage or completeness for national estimates. Some redistribution of the data based on cause of death was undertaken to fit the burden of disease cause categories. For First Nations YLL estimates, adjustments were made to account for under-identification of First Nations people in mortality records (for more information see [Adjusting for Indigenous under-identification](#)).

For 'years lived with disability' (non-fatal burden, YLD) estimates, as there is no single comprehensive and reliable source of data on the incidence, prevalence, severity and duration of all non-fatal health conditions, morbidity estimates were drawn from a wide variety of sources, and generally based on the best single source. This included administrative data, national surveys, disease registers and epidemiological studies. Potential sources for disease-specific morbidity data were required to: have case definitions appropriate to the disease being analysed; be relevant to the First Nations population; and be timely, accurate, reliable and credible.

Why use estimates from the First Nations Burden of Disease Study (FNBDS) 2022 instead of Aboriginal and Torres Strait Islander component of ABDS 2018?

Estimates from the FNBDS 2022 supersede those produced for the Aboriginal and Torres Strait Islander component of ABDS 2018. This First Nations Burden of Disease Study 2022 provides burden of disease estimates best matched to the Australian public health context for the Aboriginal and Torres Strait Islander population for 2022. It also provides estimates for 2011 and 2018, revised using the same methods as for 2022, to enable direct comparisons. The latest year, 2022, reflects the data availability from key data sources (such as the National Aboriginal and Torres Strait Islander Health Survey, deaths data, hospital admissions data and various disease registers) at the time of analysis.

Improvements made in the First Nations Burden of Disease Study 2022 include:

- COVID-19 added to the list of diseases
- new data sources or evidence from latest epidemiological studies

- new or revised conceptual models to estimate YLD for some diseases in line with changes to the ABDS disease list or new evidence
- recalculation of estimates for 2011 and 2018, to enable comparison with 2022 estimates
- updated reference life table used in calculation of YLL estimates.

Therefore, published estimates from previous Australian studies are not directly comparable with those for the First Nations Burden of Disease Study 2022 due to methodology changes.

Earlier reference years

For YLL, estimates for earlier reference years (2011, 2018) have been revised to incorporate changes in mortality coding under the ABS revisions process. Once a year, the ABS revises mortality information for coroner-certified deaths to improve the accuracy of the coding of these deaths. These revisions do not increase the overall number of deaths in any year but may change the distribution of the causes of death. Further information on the ABS mortality revisions process is available on the [ABS website](#).

For YLD, estimates for earlier reference years were largely revised due to changes in population data.

Updates to estimates for specific mental health conditions

National estimates for 2011 and 2018 were revised for conditions sourced from the National Survey of Mental Health and Wellbeing (NSMHW) (specifically depressive disorders, anxiety disorders, bipolar affective disorder and alcohol use disorder). This was to account for changes in prevalence between the 2007 and 2020–22 surveys at the national level.

For these conditions, the change in national estimates has led to a change in First Nations estimates for 2011 and 2018. Specifically, due to a lack of data on diagnosed prevalence of mental and substance use disorders in the Aboriginal and Torres Strait Islander population, indirect methods are employed to derive prevalence. For these conditions, rate ratios were calculated from linked Queensland Health Admitted Patient Data Collection (QHAPDC) and Consumer Integrated Mental Health Application (CIMHA) data. These rate ratios were then applied to nationally calculated rates to derive First Nations prevalence.

YLD estimates for autism spectrum disorders for 2018 were also updated following a revision to WA Intellectual Disability Exploring Answers (IDEA) data, which has been linked to the National Disability Insurance Scheme (NDIS), resulting in higher ascertainment of individuals with autism spectrum disorders. YLD estimates for 2018 were revised to allow comparisons with 2022 estimates, however, it should be noted that estimates for 2018 and 2022 are not strictly comparable to estimates for 2011 due to this addition of a new ascertainment source in the IDEA.

COVID-19

For the first time, COVID-19 has been included in the First Nations Burden of Disease Study as part of the infectious diseases group. The method used for the estimation of the burden of COVID-19 for First Nations people in 2022 is outlined below.

Estimation of COVID-19 for 2022 fatal burden (YLL)

Methods for calculating fatal burden (expressed as YLL) of COVID-19 used the number of deaths directly due to COVID-19, the ages at which these deaths occurred, and the Global Burden of Disease Study (GBD) standard reference life table.

Definition and coding of COVID-19 deaths

In the International Classification of Diseases 10th revision (ICD-10), COVID-19 deaths are coded in 2 ways:

ICD-10 code U07.1 – ‘COVID-19 virus identified’ is used when COVID-19 is confirmed by laboratory testing.

ICD-10 code U07.2 – ‘COVID-19 virus not identified’ is used for suspected or clinical diagnoses of COVID-19 where testing is not completed or inconclusive.

In FNBDS 2022, deaths coded to U07.1 and U07.2 as the underlying cause of death (death directly due to COVID-19) were used to estimate fatal burden. Mortality data were adjusted for First Nations under-identification.

Data sources

COVID-19 deaths for 2022 were sourced from the Nationally Mortality Database.

Non-fatal burden (YLD)

Conceptual model

The conceptual model for COVID-19 is shown in Figure 1, which was the consensus model being used by the European Burden of Disease Network (EBDN) and the Australian Burden of Disease Study (ABDS) to calculate non-fatal burden due to COVID-19 at the time of analysis.

Important components of the YLD model which acquire health loss (Figure 1) include:

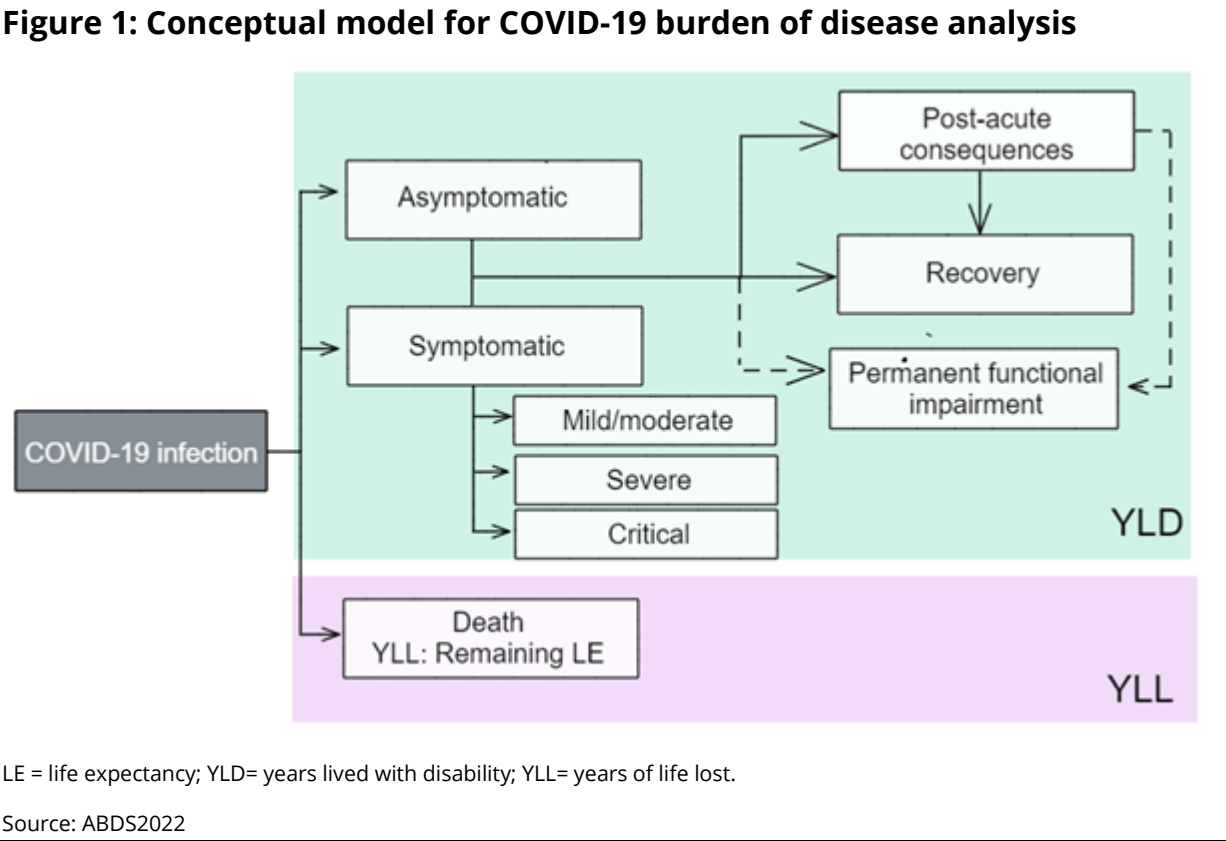
Mild/moderate cases: correspond to those not requiring hospitalisation to treat their disease. It is noted that some cases in Australia were hospitalised to maintain strict isolation rather than because of the severity of their disease (particularly at the start of the pandemic).

Severe cases: correspond to those hospitalised to treat their disease, but not requiring admission to intensive care units (ICU).

Critical cases: correspond to people who were treated in ICU.

Post-acute consequences: correspond to cases with post COVID-19 condition (also known as ‘long COVID’).

Permanent functional impairment from COVID-19 was not included in this study due to a lack of evidence. More elapsed time is needed to understand these potential consequences.



Extended description for Figure 1

Figure 1 shows the conceptual model used to estimate the non-fatal and fatal burden due to COVID-19. The diagram is a horizontal flow chart with two sections. The first section represents non-fatal burden. It shows that the non-fatal burden due to COVID-19 includes asymptomatic and symptomatic infections. Burden due to symptomatic infections is further split into 3 levels of severity: mild/moderate, severe and critical. The flow chart also shows that both asymptomatic and symptomatic infections result in either post-acute consequences or recovery, and may also result in permanent functional impairment, however only the burden due to post-acute consequences is currently included in this study. The second section represents fatal burden. It shows that COVID-19 infection could result in death. Age at death and remaining life expectancy is used to determine the number of years of life lost.

Model parameters: disability weights and disease durations

The ‘disability weights’ reflect the severity of the disease and correspond to a ‘health state’ which describes the average experience for people at that severity level. Table 1 outlines the disability weights for each health state. The disability weights were drawn from ABDS 2022.

Table 1: Health states and corresponding disability weights for COVID-19 analysis

Health state type	Severity level	Health state	Disability weight
Acute infectious disease	Asymptomatic	Has infection but experiences no symptoms	Nil
Acute infectious disease	Mild/moderate	Has a fever and aches, and feels weak, which causes some difficulty with daily activities	0.051
Acute infectious disease	Severe	Has a high fever and pain, and feels very weak, which causes great difficulty with daily activities	0.133
Acute infectious disease	Critical	Intensive care unit admission	0.655
Chronic infectious disease	Post-acute consequences	Is always tired and easily upset, the person feels pain all over the body and is depressed.	0.219

The duration used for mild/moderate cases was 7 days due to the shorter duration of Omicron infection, which was the dominant variant in Australia in 2022 (Menni et al. 2022). The duration parameters for severe and critical cases were calculated using empirical data on length of stay from the National Hospital Morbidity Database (NHMD). Hospitalisations without an ICU admission were used for severe cases, and those with ICU admission for critical cases. Length of stay for critical cases only included time spent in ICU—their time spent outside of the ICU was counted under the length of stay for severe cases.

The average duration parameter used for post-acute consequences was 5 months (Tindle 2024). This is a broad assumption as data on the full trajectory for people with long COVID are still emerging.

Data sources

Broadly, the numbers of people in each severity category were required. The input data needed to reflect the full coverage of cases, with any under-ascertainment adjusted for

with appropriate data, if available. Under-ascertainment for COVID-19 is becoming a bigger issue as time goes on due to the move from close contact tracing and strict requirements for PCR-based testing, to rapid antigen testing and reliance on self-reporting. Under-ascertainment is discussed further in each severity category.

Asymptomatic cases

An AIHW COVID-19 report (AIHW 2021c) used figures from a meta-analysis (Byambasuren et al. 2020) to estimate the proportion of asymptomatic COVID-19 cases. This showed that 17% of cases were truly asymptomatic (for example, excludes pre-symptomatic cases). However, this review was conducted in 2020 and due to the emergence of newer variants and sub-variants, higher vaccination rates and changes in requirements for COVID-19 testing in 2022, it is likely this proportion is no longer suitable.

As no data on asymptomatic cases were available, it was assumed that the NNDSS only includes symptomatic cases, and the inclusion of asymptomatic cases is minimal in estimates of mild/moderate cases.

Mild/moderate cases

This was calculated as the total number of confirmed cases recorded in the NNDSS. A disability weight of 0.051 was applied to all confirmed cases. Hospitalised cases, including those admitted to ICU, were not excluded from the mild/moderate case count. This is based on the assumption that individuals with severe or critical illness also experience a period of moderate acute infection prior to and after hospitalisation for COVID-19.

Under-ascertainment would be highest in the mild/moderate category. Given the lower severity (and hence lower contribution per case to the disease burden) in this category and challenges with adjusting for under-ascertainment with currently available data, there was not enough information to inform adjustments for under-ascertainment in this study. There are serosurvey studies that measure the prevalence of antibodies to SARS-CoV-2 in the blood donor population (for example, the National Centre for Immunisation Research and Surveillance, the Kirby Institute's Australian COVID-19 Serosurveillance Network serosurveys). However, the blood donor population may not be representative of the general Australian population.

Severe and critical cases

The number of severe cases is the number of First Nations cases admitted to hospital minus those admitted to ICU during 2022, adjusted for First Nations under-identification in hospitalisation data.

Critical cases are the number of First Nations cases admitted to ICU, adjusted for First Nations under-identification in hospitalisation data.

It is assumed that there would be virtually no under-ascertainment among the severe and critical categories as it is unlikely that people who require hospital care would not receive that care in Australia. People admitted would almost certainly have been tested for SARS-CoV-2 if there was any chance they had contracted it.

As there may be people who contracted COVID-19 in hospital (but did not suffer from severe or critical disease), identification of these cases in the data would be useful for burden estimation when more detailed hospitals data become available. However, it is acknowledged that because these cases cannot be identified, it may result in an overestimate of the burden due to severe COVID-19 (though an underestimate of mild/moderate cases). To reduce the extent of over-estimation of severe cases, COVID-19 hospitalisations were identified as those with a principal diagnosis indicating COVID-19, or an additional diagnosis of COVID-19 with a principal diagnosis in the ICD-10-AM chapters 'Certain infectious and parasitic diseases', 'Diseases of the respiratory system', or 'Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified'.

Post-acute consequences

For the FNBDS 2022, a proportion of 4.5% (for those aged 25 years and older) and a proportion of 1.44% (for those aged under 25 years) were used to estimate the number of cases who developed post-acute consequences from their COVID-19 infection. The proportion for those aged 25 years and over was sourced from the study by Antonelli et al. (2022) and was the proportion of Omicron cases who experienced long COVID. This proportion was not used for those aged under 25 years as there is evidence showing the likelihood of getting long COVID in younger age groups is lower (GBD Long COVID Collaborators 2022). The proportion for those aged under 25 years was based on the estimated percentage of people under 25 years living in private households with self-reported long COVID of any duration in the UK. This proportion was based on the UK Coronavirus (COVID-19 Infection Survey) data for the 4-week period ending 3 September 2022 (ONS 2022).

Population data

Changes to the Aboriginal and Torres Strait Islander population

On 24 July 2024, the ABS released *Estimates and projections, Aboriginal and Torres Strait Islander Australians, 2011 to 2031* based on the 2021 Census. The release included detailed backcast population estimates from 2011 to 2020 and projections to 2031.

Between 2016 and 2021, the Census-based Aboriginal and Torres Strait Islander population estimates increased by 25.2%, with less than half (43.5%) of this increase being due to demographic factors (births, deaths and migration). The rest of the increase was due to other (non-demographic) factors (56.5%), including changes in the propensity of people to identify as Indigenous.

The substantial amount of non-demographic change between the 2016 and 2021 Censuses – more than double that seen previously – suggests that identification has changed quite significantly in the past few years. It seems unlikely that such a substantial change would be limited to the Census and not show up in other administrative data sources.

Which population data was used in FNBDS 2022?

As a result of the changes in the Aboriginal and Torres Strait Islander population, all First Nations population-based rates in the FNBDS 2022 were calculated using an **interpolated population series**. The interpolated population series uses the 2011, 2016 and 2021 Census points as anchors and assumes a consistent growth from one Census point to another. Identification change is inherent as part of the Census points. The AIHW projected the interpolated series forward one year to maintain demographic consistency between the interpolated population for historical years (2011, 2018) and the 2022 reference year.

Non-Indigenous population estimates were calculated by subtracting the interpolated Aboriginal and Torres Strait Islander population estimates from the total Australian population estimates for the same years.

The Australian 2001 standard population (published 20 June 2013) was used for all age-standardisation, as per AIHW and ABS standards.

Adjusting for Indigenous under-identification

The National Hospital Mortality Database (NHMD) and the AIHW's National Mortality Database (NMD) are key data sources used for estimating the burden of disease in the FNBDS 2022. However, hospitalisations and deaths of First Nations people are under-identified to varying degrees across state/territory and remoteness areas as well as over time. The incompleteness of First Nations identification means that hospital separations and deaths recorded as Indigenous are an underestimate of the actual number of hospitalisations and deaths of First Nations people.

The National Health Data Hub (NHDH), formerly the National Integrated Health Services Information (NIHSI) analytical asset, is a major national health data linkage system that brings together hospitalisation data from 1 July 2010 to 30 June 2022, and National Death Index (NDI) records from 1 July 2010 to 31 December 2022, with other data sets including the Medicare Benefits Schedule (MBS), Pharmaceutical Benefits Scheme (PBS), Aged care services data, and the Australian Immunisation Register (AIR) data.

The NHDH hospitalisation data included Admitted patient care data and Emergency Department Care data in public and private hospitals for all states and territories with the exception of Western Australia and the Northern Territory. Note that Non-Admitted Patient episode-level data were not available for FNBDS 2022.

The NHDH was used to derive under-identification adjustment factors for hospitalisation and mortality data for the 2022 reference year in the FNBDS 2022. Adjustment factors for Western Australia derived from the Western Australian Data Linkage System were provided by WA Health, as hospital data for WA are not included in the NHDH.

Hospitalisation adjustment factors by state/territory and remoteness area were calculated by dividing the number of First Nations hospitalisations in the Admitted Patient Data based on the NHDH-enhanced First Nations identification, by the observed

number of First Nations hospitalisations originally recorded in the Admitted Patient Data.

Similarly, 2022 mortality adjustment factors by state/territory and remoteness area were calculated by dividing the number of First Nations deaths in the Mortality Data based on the NHDH-enhanced First Nations identification, by the observed number of First Nations deaths recorded in the National Death Index (NDI). The year 2021 was selected to determine mortality adjustment prior to the introduction of dual-source identification for NSW deaths in 2022. It is assumed that the level of under-identification of First Nations people in mortality data otherwise remained consistent between 2021 and 2022.

Under-identification adjustment factors for 2011 and 2018 were obtained from previous AIHW analyses (AIHW 2013 and 2023).

Note that this method assumes that data for people who are identified as First Nations people in these two data sources are representative of First Nations people who are not identified as such. While this is not necessarily the case, it is the best information available at present.

Hospital presentation ratios

The National Hospital Mortality Database (NHMD) was a key data source for estimating non-fatal burden for some diseases in FNBDS 2022. However, the NHMD provides counts of the number of hospital separations rather than the number of individual patients and to estimate point prevalence, the FNBDS needed data relating to people rather than clinical events.

AIHW analyses of linked hospitalisations and deaths data from the NHDH was used to calculate people-to-hospitalisations ratios for New South Wales, Queensland, Victoria, South Australia, Tasmania and the Australian Capital Territory for selected sequelae. These ratios were then applied to corresponding hospitalisation counts by sex and age from the NHMD to derive a count of people.

Linked hospitals and deaths data from Western Australia were also used by WA Health to calculate people-to-hospitalisations ratios for selected sequelae.

A combination of data from the NHDH and Western Australia was used as the hospital presentation ratios across all states and territories.

Reference life table

The reference life table used in burden of disease methodology to measure years of life lost due to early death is an aspirational goal designed to represent the gold standard of life expectancy.

All previous iterations of the ABDS (ABDS 2011 onwards) have used the Global Burden of Disease (GBD) 2010 Standard Reference Life Table (SRLT) (Murray et al. 2012). A more recent GBD life table, the GBD 2021 Theoretical Minimum Risk Reference Life Table (TMRLT), has been used in the FNBDS 2022. The GBD 2021 TMRLT is an internationally

recognised and accepted reference table for burden of disease analysis representing the most recent expression of aspirational life expectancies based on lowest worldwide mortality rates.

Compared with the GBD 2010 life table, the GBD 2021 life table increases life expectancy at birth and up to around age 90 by approximately 4 years, and by around 5 years thereafter. Therefore, using the GBD 2021 life table results in an increase in YLL, and a higher proportion of total burden contributed by YLL, compared to previous ABDS results.

To ensure comparability between population groups and over time, the same reference life table was used for First Nations and non-Indigenous fatal burden estimates and all subnational analyses, and for all reference years (2011, 2018 and 2022) in the FNBDS 2022.

Indigenous status in New South Wales deaths data

In New South Wales, the method for identifying Indigenous status in deaths data changed in 2022. Prior to 2022, the Indigenous status of deaths registered in NSW was derived from the Death Registration Statement (DRS) only but from 2022 onward, information from the Medical Certificate of Cause of Death (MCCD) was used as a secondary source to help determine the Indigenous status of the deceased. As a result of improved identification of First Nations people, the number of reported First Nations deaths in NSW rose sharply in 2022. To maintain comparability with data from earlier years used in FNBDS, a deaths file where the secondary source method had not been applied was provided by the NSW Register of Births, Deaths and Marriages for use in FNBDS analyses. Under-identification adjustment based on 2021 data was applied as described above.

YLL and YLD data quality

The quality of input estimates in the FNBDS 2022 for earlier reference years (2011 and 2018) are the same as the quality presented in the ABDS 2018. Therefore, refer to Appendix B in the Australian Burden of Disease Study: impact and causes of illness and death in Australia 2018 report (AIHW 2021a) and the Australian Burden of Disease Study: methods and supplementary material 2018 report (AIHW 2021b) for more detail on the quality of the YLD estimates and the data and methods used for the earlier reference years.

COVID-19 was added to the FNBDS 2022 as a new disease. To help users understand the potential sources of uncertainty associated with the estimates, the 2-dimensional index developed for the burden estimates was used for this disease. This index was derived based on:

- the relevance of the underlying epidemiological data
- the methods used to transform that data into a form required by this analysis.

The quality of COVID-19 estimates is discussed below.

COVID-19

Estimates for acute consequences of COVID-19 are of good quality. Data sources for acute consequences were considered relevant as they were directly observed from the NNDSS and the NHMD, adjusted for First Nations under-identification. However, the estimates for post-acute consequences of COVID-19, which is the biggest contributor to non-fatal burden, were calculated using 2 proportions (one proportion for those aged under 25 years and another for those aged 25 years and over) so substantial modelling was done to estimate burden by sex and 5-year age groups. Therefore, estimates for post-acute consequences of COVID-19 should be interpreted with caution.

Data score = D

Method score = D

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Report editions

BOD 41 [First Nations Burden of Disease Study 2022, About - Australian Institute of Health and Welfare](#) [This release]

BOD 32 [Australian Burden of Disease Study: impact and causes of illness and death in Aboriginal and Torres Strait Islander people 2018, Summary - Australian Institute of Health and Welfare](#)

BOD 7 [Australian Burden of Disease Study: impact and causes of illness and death in Aboriginal and Torres Strait Islander people 2011, Summary - Australian Institute of Health and Welfare](#)

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BOD 26 [Australian Burden of Disease Study: Methods and supplementary material 2018, About - Australian Institute of Health and Welfare](#)

BOD 40 [Australian Burden of Disease Study 2024, About - Australian Institute of Health and Welfare](#)

The *First Nations Burden of Disease Study 2022* report describes the impact of 220 diseases and injuries on the Aboriginal and Torres Strait Islander population in terms of living with illness (non-fatal burden) and premature death (fatal burden). It provides new estimates for the reference year 2022, along with updated and comparable estimates for 2018 and 2011.

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